ICAR-IIMR

Indian Institute of Maize Research

वार्षिक प्रतिवेदन
Annual Report
2025

भा.कृ.अनु.प.-भारतीय मक्का अनुसंधान संस्थान
लाडोवाल, गाँव चाहड़, लुधियाना,141008 पंजाब-(भारत)
ICAR-Indian Institute of Maize Research
Ladhowal, Chahar Village, Ludhiana-141008 (India)

Nurturing diversity, resilience, livelihood & industrial inputs

वार्षिक प्रतिवेदन
ANNUAL REPORT
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भाकृअनुप
ICAR

ICAR-INDIAN INSTITUTE OF MAIZE RESEARCH

Ladhowal, Chahar Village, Ludhiana (PB)-141008 (INDIA)

परिशुद्ध उद्धरण :
Citation:

वार्षिक प्रतिवेदन 2025,
भा.कृ.अनु.प.-भारतीय मक्का अनुसंधान संस्थान,
लाडोवाल, गाँव चाहड़, लुधियाना, पंजाब – 141008
ICAR-IIMR Annual Report 2025,
ICAR-Indian Institute of Maize Research
Ladhowal, Village Chahar , Ludhiana (PB) – 141008.

संपादन मंडल:
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Dr. Mukesh Choudhary
डॉ. ऐच. ऐस. जाट
Dr. H.S. Jat

प्रकाशक:
Published By :

निदेशक
Director
भा.कृ.अनु.प.-भारतीय मक्का अनुसंधान संस्थान,
ICAR-Indian Institute of Maize Research
लाडोवाल, गाँव चाहड़, लुधियाना, पंजाब–141008
Ladhowal, Chahar village, Ludhiana – 141008
ई.मेल/E-mail
pdmaize@gmail.com
वेबसाइट/Website
www.iimr.res.in

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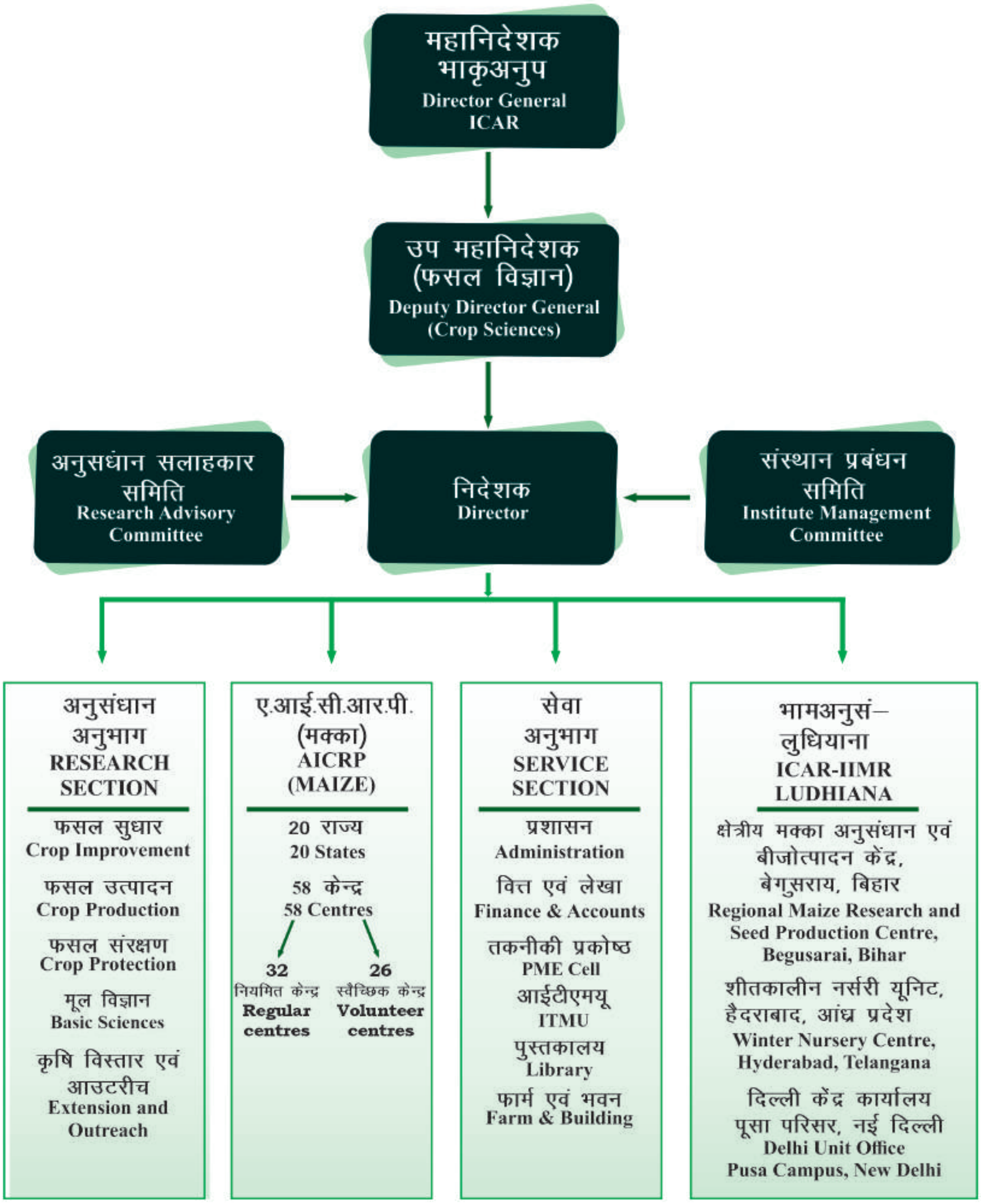
भा.कृ.अनु.प.-भा.म.अनु.सं. का संगठनात्मक चार्ट

Organogram of ICAR-IIMR



कर्मचारी पद/Staff Position

प्रस्तावना

वर्ष 2025 में भा.कृ.अनु.प.दृभारतीय मक्का अनुसंधान संस्थान (ICAR–IIMR), लुधियाना ने मक्का अनुसंधान, विकास एवं प्रसार गतिविधियों की प्रगति में एक और महत्वपूर्ण उपलब्धि दर्ज की है । मक्का अनुसंधान के राष्ट्रीय नोडल संस्थान के रूप में, संस्थान ने फसल सुधार, आधारभूत विज्ञान, फसल उत्पादन, फसल संरक्षण, कृषि प्रसार तथा समन्वित अनुसंधान कार्यक्रमों के माध्यम से मक्का क्षेत्र में उभरती चुनौतियों एवं अवसरों का प्रभावी ढंग से समाधान करने की दिशा में अपने समन्वित प्रयास निरंतर जारी रखे। भारत का मक्का क्षेत्र एक परिवर्तनकारी दौर में प्रवेश कर चुका है। नवीनतम राष्ट्रीय अनुमानों के अनुसार, देश में मक्का का उत्पादन रिकॉर्ड 55.09 मिलियन टन तक पहुँच गया है, जो पिछले वर्ष के 43.41 मिलियन टन उत्पादन की तुलना में लगभग 11.68 मिलियन टन की उल्लेखनीय वृद्धि दर्शाता है। यह अभूतपूर्व उपलब्धि उन्नत संकर किस्मों के विकास, बेहतर फसल प्रबंधन तकनीकों, मक्का के बढ़ते रकबे तथा पशु आहार, खाद्य प्रसंस्करण एवं जैव–एथेनॉल उद्योगों से बढ़ती मांग के संयुक्त प्रभाव का परिणाम है। आज मक्का देश की सबसे तीव्र गति से विकसित होने वाली प्रमुख अनाज फसलों में से एक बन चुका है और खाद्य, पशु आहार, चारा, पोषण तथा ऊर्जा सुरक्षा सुनिश्चित करने के लिए एक रणनीतिक फसल के रूप में उभरकर सामने आया है। इस वार्षिक प्रतिवेदन में प्रस्तुत उपलब्धियाँ देशभर के वैज्ञानिकों, तकनीकी कर्मचारियों, सहयोगी संस्थानों तथा विभिन्न हितधारकों के सामूहिक योगदान का प्रतिफल हैं। वर्ष के दौरान उच्च उपज देने वाले मक्का संकरों, क्वालिटी प्रोटीन मक्का (QPM), बेबी कॉर्न तथा अन्य विशिष्ट (स्पेशलिटी) मक्का किस्मों के विकास एवं विमोचन में उल्लेखनीय प्रगति हुई। इसके साथ ही, जीनोम संपादन, आणविक प्रजनन, जैविक एवं अजैविक तनाव सहनशीलता अध्ययन, पोषण गुणवत्ता संवर्धन तथा जैव–एथेनॉल उत्पादन एवं साइलेज विकास सहित मूल्य संवर्धित औद्योगिक अनुप्रयोगों के क्षेत्रों में अनुसंधान को और अधिक सुदृढ़ बनाया गया।

संसाधन संरक्षण एवं जलवायु–अनुकूल मक्का–आधारित उत्पादन प्रणालियों के माध्यम से सतत फसल उत्पादन प्रौद्योगिकियों को निरंतर प्राथमिकता प्रदान की गई। प्रमुख रोगों एवं कीटों के विरुद्ध प्रतिरोधी स्रोतों की पहचान तथा उनके प्रभावी प्रबंधन विकल्पों के विकास में भी उल्लेखनीय प्रगति हुई, जिससे फसल संरक्षण एवं उत्पादन की स्थिरता को सुदृढ़ आधार मिला। व्यापक अग्रिम पंक्ति प्रदर्शन (Frontline Demonstrations), क्षमता निर्माण कार्यक्रमों तथा प्रौद्योगिकी प्रसार पहलों के माध्यम से संस्थान ने यह सुनिश्चित किया कि अनुसंधान से प्राप्त उपलब्धियाँ किसानों तथा अन्य हितधारकों तक प्रभावी ढंग से पहुँचें, जिससे उन्नत मक्का उत्पादन प्रौद्योगिकियों को व्यापक स्तर पर अपनाने को बढ़ावा मिला।

अखिल भारतीय समन्वित मक्का अनुसंधान परियोजना (AICRP on Maize) ने बहु–स्थानिक परीक्षण, प्रौद्योगिकियों के प्रमाणीकरण तथा उनके व्यापक प्रसार के लिए एक सशक्त राष्ट्रीय मंच के रूप में अपनी महत्वपूर्ण भूमिका निरंतर निभाई। परियोजना से जुड़े विभिन्न सहभागी केंद्रों के समन्वित प्रयासों ने राष्ट्रीय मक्का सुधार कार्यक्रम को सुदृढ़ बनाने तथा विविध कृषि–जलवायु परिस्थितियों के अनुरूप उपयुक्त मक्का किस्मों एवं संकरों के विकास में उल्लेखनीय योगदान दिया।

हम सभी सहयोगी संस्थानों, वित्तपोषण एजेंसियों, राज्य कृषि विश्वविद्यालयों, अखिल भारतीय समन्वित मक्का अनुसंधान परियोजना (AICRP) के केंद्रों, विकास विभागों, निजी क्षेत्र के सहयोगी संगठनों तथा कृषकों के प्रति अपनी हार्दिक कृतज्ञता एवं प्रशंसा व्यक्त करते हैं, जिनके निरंतर सहयोग, सहभागिता और समर्थन से ये उल्लेखनीय उपलब्धियाँ संभव हो सकीं। हमें आशा है कि इस वार्षिक प्रतिवेदन में संक्षेपित जानकारी भारत में मक्का क्षेत्र के विकास से जुड़े शोधकर्ताओं, नीति–निर्माताओं, कृषि प्रसार कर्मियों, विद्यार्थियों तथा अन्य सभी हितधारकों के लिए एक उपयोगी संदर्भ सामग्री सिद्ध होगी।

निदेशक

भा.कृ.अनु.प.–भारतीय मक्का अनुसंधान संस्थान (ICAR–IIMR), लुधियाना

उद्देश्य और विज़न

Mission & Vision

भा.कृ.अनु.प.–भा.म.अनु.सं.

ICAR-IIMR

आर्थिक एवं पर्यावरणीय स्थिरता के साथ मक्का और मक्का आधारित कृषि प्रणालियों की उत्पादकता, लाभप्रदता तथा प्रतिस्पर्धा को बढ़ाना।

Enhancing the productivity, profitability and competitiveness of maize and maize-based farming system with economic and environmental sustainability.

मक्का की खेती और उपयोग से प्रत्यक्ष या अप्रत्यक्ष रूप से जुड़े समस्त जनमानस के लिए कृषि और औद्योगिक क्षेत्रों में संपदा तथा रोजगार सृजन हेतु मक्का और मक्का आधारित उत्पादों के खाद्य, चारा (फीड) एवं औद्योगिक अनुप्रयोग में व्यापक रूप से वृद्धि करना।

Rapid growth in the food, feed and industrial application of maize and maize-based products, for generation of wealth and employment in farming and industrial sectors, and for all those who are directly or indirectly associated with maize cultivation and utilization.

Preface

The year 2025 marked another significant milestone in the advancement of maize research, development and outreach activities undertaken by ICAR–Indian Institute of Maize Research (IIMR), Ludhiana. As the national nodal institute for maize research, IIMR continued to address emerging challenges and opportunities in the maize sector through integrated efforts in crop improvement, basic sciences, crop production, crop protection, extension and coordinated research programmes.

India's maize sector has entered a transformative phase. According to recent national estimates, maize production has reached a record 55.09 million tonnes, representing an increase of nearly 11.68 million tonnes over the previous year's production of 43.41 million tonnes. This remarkable growth reflects the combined impact of improved hybrids, enhanced crop management practices, expanding cultivation, and increasing demand from the feed, food processing and bioethanol sectors. Maize has emerged as one of the fastest-growing cereal crops in the country and is now a strategic commodity for ensuring food, feed, fodder, nutritional and energy security.

The achievements presented in this Annual Report reflect the collective contributions of scientists, technical staff, collaborating institutions and stakeholders across the country. During the year, substantial progress was made in the development and release of high-yielding maize hybrids, quality protein maize (QPM), baby corn and specialty maize cultivars. Research efforts were further strengthened through advances in genome editing, molecular breeding, stress tolerance studies, nutritional enhancement and value-added industrial applications, including bioethanol production and silage development.

Sustainable crop production technologies received continued emphasis through resource-conserving and climate-resilient maize-based production systems. Significant progress was also achieved in identifying resistance sources and management options for major diseases and insect pests, thereby contributing to enhanced crop protection and production stability. Through extensive frontline demonstrations, capacity-building programmes and technology dissemination initiatives, the institute ensured that research outputs reached farmers and other stakeholders, leading to wider adoption of improved maize technologies.

The All India Coordinated Research Project (AICRP) on Maize continued to serve as a strong national platform for multi-location evaluation, validation and dissemination of maize technologies. The coordinated efforts of participating centres contributed significantly to strengthening the national maize improvement programme and ensuring the development of cultivars suited to diverse agro-ecological conditions.

We place on record our sincere appreciation to all collaborating organizations, funding agencies, state agricultural universities, AICRP centres, development departments, private-sector partners and farmers whose continued support and participation contributed to these achievements. We hope that the information contained in this summary will serve as a useful reference for researchers, policymakers, extension personnel, students and all stakeholders engaged in the development of the maize sector in India.

Director
ICAR–Indian Institute of Maize Research (IIMR), Ludhiana

अधिदेश
MANDATE

विशिष्ट मक्का सहित मक्का की उत्पादकता और उत्पादन को बढ़ाने के उद्देश्यसे मौलिक एवं कार्यनीतिपरक अनुसंधान करना।

Basic and strategic research aimed at enhancement of productivity and production of maize, including specialty corn.

विविध कृषि जलवायु परिस्थितियों के लिए उपयुक्त प्रौद्योगिकियों की पहचान करने हेतु बहुस्थानिक एवं बहुआयामी अनुसंधान में समन्वय करना।

Coordination of multi-disciplinary and multi-location research to identify appropriate technologies for variedagro-climatic conditions.

उन्नत प्रौद्योगिकियों का प्रसार, क्षमता निर्माण और विकासशील संपर्क स्थापित करना।

Dissemination of improved technologies, capacity building and developing linkages.

मक्का पर अखिल भारतीय समन्वित अनुसंधान परियोजना (ए.आई.सी.आर.पी) का समन्वय और विस्तार एवं आउटरीच कार्यक्रम को कार्यान्वित करना

Coordination of the All india Coordinated Research Project (AICRP) on Maize and to carry out extension andoutreach programmes

कार्यकारी सारांश

फसल सुधार

संस्थान द्वारा विमोचित संकर किस्में

चार फील्ड कॉर्न संकर किस्में IMH 232, IMH 233, IMH 234 एवं IMH 235 — विभिन्न कृषि–जलवायु क्षेत्रों के लिए विमोचित की गईं। IMH 232 पूर्वी उत्तर प्रदेश, बिहार, झारखण्ड, ओडिशा एवं पश्चिम बंगाल में खरीफ ऋतु के लिए उपयुक्त पाई गईय IMH 233 को उत्तर–पश्चिमी मैदानी क्षेत्र (NWPZ) में वसंत ऋतु के लिए अनुशंसित किया गयाय IMH 234 ने उत्तर–पूर्वी मैदानी क्षेत्र (NEPZ) एवं प्रायद्वीपीय क्षेत्र (PZ) में खरीफ अनुकूलन को समाहित कियाय तथा IMH 235 को NEPZ में रबी के लिए विमोचित किया गया। चारों किस्मों ने सम्बद्ध मानक जाँच किस्मों की तुलना में उपज में श्रेष्ठता प्रदर्शित की और तना छेदक, फॉल आर्मीवर्म तथा प्रमुख पर्णीय एवं तना रोगों के प्रति मध्यम प्रतिरोध दर्शाया। साथ ही, ये किस्में आवासन–सहनशील (Lodging Tolerant) हैं तथा उच्च आदान–स्तर पर अनुकूल प्रतिक्रिया देती हैं।

QPM संकर किस्मों की अधिसूचना

विभिन्न क्षेत्रों में कृषि हेतु नौ गुणवत्ता प्रोटीन मक्का (QPM) संकर किस्में — IQMH 206 से IQMH 214 तक अधिसूचित की गईं। इन किस्मों में उच्च लाइसिन एवं ट्रिप्टोफैन के साथ–साथ अधिक अनाज उपज है और अनेक प्रविष्टियों में प्रमुख रोगों एवं तना छेदकों के प्रति मध्यम प्रतिरोध भी विद्यमान है। इन संकरों ने NEPZ, NWPZ, CWZ, NHZ एवं PZ में संस्थान की पोषण–संवर्धित मक्का को और सुदृढ़ किया।

बेबी कॉर्न संकर किस्मों की अधिसूचना

IBCH 403 को एक CMS–आधारित बेबी कॉर्न संकर के रूप में अधिसूचित किया गया, जिसमें व्यापक अनुकूलन, शीघ्र परिपक्वता तथा 3–4 तुड़ाइयों की क्षमता है जबकि IBCH 402 को क्षेत्र–विस्तार के लिए और अधिकृत किया गया। दोनों संकरों ने उच्च बेबी कॉर्न एवं चारा उपज के साथ, नर–मंजरी निष्कासन (Detasseling) की आवश्यकता समाप्त कर श्रम बचत तथा पर्णीय झुलसन एवं तना छेदक के विरुद्ध उपयोगी प्रतिरोध पाया गया।

AICRP में प्रोन्नत संकर किस्में

अनेक फील्ड कॉर्न प्रविष्टियाँ NIVT एवं AVT-I से परीक्षण के उच्चतर चरणों में प्रोन्नत हुईं, जिनमें बिहार में IMH 2–22K–13 तथा AICRP खरीफ 2024 सारिणी की दो फील्ड कॉर्न प्रविष्टियाँ सम्मिलित हैं। खरीफ 2025 परीक्षण के लिए नौ QPM संकरों को भी प्रोन्नत किया गया, जबकि एक CMS–आधारित बेबी कॉर्न संकर IBH 11–243, NIVT से AVT-I में पहुँचा। गुजरात एवं जम्मू–कश्मीर की श्वेत मक्का प्रविष्टियाँ भी राज्य परीक्षणों में आगे बढ़ीं।

फील्ड कॉर्न जर्मप्लाज्म विकास

150 विच्छेदी (Segregating) अंतःप्रजनित वंशक्रमों को स्वपरागण एवं हस्त–परागण के माध्यम से C6 से C7 पीढ़ी में अग्रसारित किया गया, जिनकी उपज–क्षमता 1.8 से 4.6 टन प्रति हेक्टेयर के मध्य रही। भविष्य के संकर विकास के लिए उन्नत प्रजनन–सामग्री तैयार करने हेतु बेगूसराय एवं लुधियाना में विषमयुग्मजता–समूहन जनसंख्याएँ (Heterotic Grouping Populations) भी उनत किया गया।

प्रयोगात्मक संकरों का मूल्यांकन

लुधियाना एवं बेगूसराय में सामान्य वातावरण में लाइन टेस्टर तथा डायलेल प्रयोगात्मक संकरों के एक विशाल समूह का मूल्यांकन किया गया। अनेक संकरों ने सर्वश्रेष्ठ मानक जाँच से अधिक उपज अर्जित की, जो यह प्रमाणित करता है कि संकरण कार्यक्रम भविष्य की प्रोन्नति के लिए उच्च–प्रदर्शनकारी संयोजन उत्पन्न कर रहा है।

लुधियाना में डायलेल प्रयोगात्मक संकरों का मूल्यांकन

IIMR, लुधियाना में खरीफ 2024 के दौरान 55 डायलेल संकरों का मूल्यांकन किया गया। श्रेष्ठ प्रदर्शन करने वाले संकरों ने मानक जाँच किस्मों को पीछे छोड़ा, जिनमें IMH 2-24K-18 ने सर्वाधिक अनाज उपज तथा सर्वोत्तम जाँच के सापेक्ष सशक्त श्रेष्ठता दर्ज की।

बेगूसराय में डायलेल प्रयोगात्मक संकरों का मूल्यांकन

RMR एवं SPC, बेगूसराय में रबी 2024–25 के दौरान 55 डायलेल संकरों का परीक्षण किया गया। यद्यपि परीक्षण विलम्ब से स्थापित हुआ तथा समग्र अभिव्यक्ति अपेक्षाकृत कम रही, तथापि छः प्रयोगात्मक संकरों ने सर्वश्रेष्ठ जाँच से अधिक उपज दी, जिनमें IMH 2-24R-38 प्रथम स्थान पर रहा।

सफेद मक्का संकरों का मूल्यांकन

वसंत 2025 के दौरान लुधियाना में दो सौ सफेद मक्का संकरों का मूल्यांकन किया गया और अनेक संकरों ने सर्वोत्तम जाँच से अधिक उपज दर्ज की। खरीफ 2024 के दौरान मूल्यांकित अतिरिक्त सफेद मक्का समूहों से भी श्रेष्ठ संकर प्राप्त हुए, जो विशिष्ट सफेद मक्का कृषि के लिए प्रजनन श्रृंखला को सहयोग प्रदान करते हैं।

अजैविक तनावों के लिए मक्का जर्मप्लाज्म का मूल्यांकन

IIWBR क्षेत्रीय केन्द्र पर लवणता मूल्यांकन में IMH 223, 111363 एवं 111391 जैसे जीनोटाइप को लवणीय परिस्थितियों में आशाजनक पाया गया। मूल्यांकन से यह भी ज्ञात हुआ कि तीव्र तप्या तनावों ने कुछ प्रविष्टियों में बीज–बनने (Seed Set) को प्रतिकूल रूप से प्रभावित किया, जिससे बनने–सहनशील मक्का सामग्री विकसित करने की आवश्यकता और अधिक रेखांकित हुई।

जल-भराव तनाव के लिए मक्का संकरो का मूल्यांकन

लुधियाना में जल–भराव की परिस्थितियों में हाल ही में विमोचित नौ फील्ड कॉर्न संकरों का मूल्यांकन किया गया। IMH 225 एवं IMH 222 सहित पाँच संकरों ने सर्वश्रेष्ठ जाँच से अधिक उपज दी, तथा IMH 225 ने 6.714 टन प्रति हेक्टेयर उपज एवं लगभग 30 प्रतिशत श्रेष्ठता के साथ शीर्ष स्थान अर्जित किया।

जैविक प्रतिबल के लिए मक्का जर्मप्लाज्म की छनाई

रबी 2024–25 के दौरान फॉल आर्मीवर्म एवं गुलाबी तना छेदक के विरुद्ध 61 अंतःप्रजनित वंशक्रमों के एक समूह की छनाई की गई। MIL 2–100 एवं MIL 2-325-1 ने फॉल आर्मीवर्म के प्रति आशाजनक प्रतिरोध प्रदर्शित किया, जबकि डप्स 2–154–1 एवं डप्स 678–1 गुलाबी तना छेदक के प्रति प्रतिरोधी पाई गईं।

TLB प्रतिरोध की वंशागति

टर्सिकम पर्णीय झुलसन (TLB) प्रतिरोध की आनुवंशिक वंशागति के अध्ययन हेतु प्रतिरोधी एवं संवेदनशील जनकों से एक हाफ–आबादी जनसंख्या विकसित की गई। इस सामग्री का मूल्यांकन मांड्या एवं धारवाड़ में कृत्रिम रोग (Artificial Epiphytotic) परिस्थितियों में किया गया तथा विश्लेषण में प्रतिरोध के लिए पर्याप्त आनुवंशिक विविधता पाई गई।

चारा एंव साइलेज मक्का के लिए जंगली प्रजातियाँ

मक्का प्रजनन में संरक्षण एवं उपयोग के लिए सम्भावी प्रजातियों को बनाए रखने के लिए एक Wild Relative Block स्थापित किया गया। चारा, साइलेज एवं तनाव–सम्बन्धी लक्षणों के लिए प्रजनन–आधार को समृद्ध करने हेतु वन्य संकर, द्विगुणित हैप्लॉइड एवं विच्छेदी पीढ़ियाँ अग्रसारित की गईं।

साइलेज मक्का मूल्यांकन

साइलेज–उन्मुख संकरों का विभिन्न ऋतुओं में जैवभार (Biomass) एवं गुणवत्ता लक्षणों के लिए मूल्यांकन किया गया। IMH 222, IMH 225 एवं अन्य संकरों सहित आशाजनक प्रविष्टियों ने सशक्त जैवभार एवं पोषण–गुणवत्ता प्रदर्शन दिखाया, जबकि अनेक प्रविष्टियों को जैव–रासायनिक एवं पाचनशीलता विश्लेषण हेतु चयनित किया गया।

गुणवत्ता लक्षणो के लिए प्रजनन

प्रजनन कार्य में स्टार्च, इथेनॉल–रिकवरी, एफ्लाटॉक्सिन प्रबंधन, जिंक, आयरन, लाइसिन, ट्रिप्टोफैन एवं प्रोटीन गुणवत्ता को लक्ष्य बनाया गया। इथेनॉल उपयोग हेतु उच्च–स्टार्च संकरों एवं निष्कर्षणीय–स्टार्च सामग्री की पहचान की गई तथा एक दमनकारी योगदा ने भंडारित मक्का दाने में एफ्लाटॉक्सिन संदूषण को कम के लिए सशक्त क्षमता प्रदर्शित की।

उच्च-स्टार्च मक्का एंव इथेनॉल रिकवरी

एक व्यापक परीक्षण में 62 प्रतिशत से अधिक निष्कर्षणीय स्टार्च वाले संकरों की पहचान की गई तथा अभिजात संकरों के एक समूह ने उच्च अनाज उपज के साथ उच्च स्टार्च मात्रा का समन्वय प्रस्तुत किया। प्रक्रिया–अनुकूलन कार्य ने बेहतर इथेनॉल–रिकवरी एवं सुरक्षित DDGS गुणवत्ता में भी सहयोग दिया।

उच्च-स्टार्च मक्का के लिए मेटा-QTL विश्लेषण

मेटा–QTL विश्लेषण ने स्टार्च मात्रा, सूखा–सहनशीलता एवं जल–भराव सहनशीलता के लिए स्थिर जीनोमिक क्षेत्रों की पहचान की। ये अभिताप–स्थल क्षेत्र (Hotspot Regions), मार्कर–सहायतित प्रजनन तथा जलवायु–अनुकूल जैव–इथेनॉल मक्का विकास के लिए उपयोगी लक्ष्य उपलब्ध कराते हैं।

उच्च जिंक एंव QPM

अनाज में जिंक, आयरन, प्रोटीन मात्रा एवं प्रोटीन गुणवत्ता के लिए स्थिर QTL की पहचान की गई। ट्रांसक्रिप्टोम अध्ययन से संभावित अभ्यर्थी जीनों का सत्यापन किया गया तथा आयरन एवं जस्ते के संचयन को बढ़ाने के लिए HRZ समजात अनुक्रमों (Orthologues) का जीनोम संपादन प्रारम्भ किया गया।

बहु लक्षण गुणवत्ता वंशक्रम

उच्च प्रोटीन, लाइसिन, ट्रिप्टोफैन, प्रो–विटामिन A एवं कम फाइटिक अम्ल का संयोजन समन्वी वाली बहु–लक्षण गुणवत्ता अंतःप्रजनित वंशक्रम विकसित किए गए। यह विकसित सामग्री पोषण–संवर्धित मक्का की श्रृंखला को और सुदृढ़ बनती है।

आशाजनक प्रोटीन-गुणवत्ता वंशक्रम

मेथियोनीन, ट्रिप्टोफैन एवं लाइसिन मात्रा के लिए अंतःप्रजनित वंशक्रमों के एक समूह का मूल्यांकन किया गया और भावी प्रजनन–उपयोग के लिए अनेक आशाजनक वंशक्रमों की पहचान की गई।

दिव्यगुणित हैप्लॉइड (DH) वंशक्रम

नवीन DH वंशक्रम विकसित किए गए और उनके स्व–प्रदर्शन क्षमता (Per Se Performance) का मूल्यांकन किया गया, जिनमें अनेक वंशक्रमों ने उच्च दाना उपज के साथ उपयोगी प्रजनन–मूल्य प्रशीति किया।

प्रयोगात्मक QPM संकर

एक सौ ग्यारह प्रयोगात्मक QPM संकरों का परीक्षण किया गया और सर्वोत्तम संयोजनों ने अनाज उपज में स्पष्ट श्रेष्ठता प्रदर्शित की, जिससे QPM प्रजनन श्रृंखला की सतत प्रगति को बल मिला।

आधारभूत विज्ञान

जीनोम संपादन उपकरणों द्वारा उन्नत मक्का पादप-प्रकारों का विकास

स्टार्च संघटन, बैंडेड पर्ण एवं आच्छद–झुलसन (BLSB) प्रतिरोध, शाकनाशी सहनशीलता, दाना–संख्या, उपज तथा पादप–संरचना में सुधार के लिए SBEII, FBL41, ALS, KRN2 एवं RAVL1 जीन को लक्षित करते हुए पाँच CRISPR/Cas9 संरचनाएँ (Constructs) विकसित की गईं। इन्हें संयोजित किया गया, भ्रूणजनक कैलस में रूपान्तरित किया गया तथा आणविक स्तर पर सत्यापित किया गया कुछ लक्ष्यों के लिए T0 पादप प्राप्त हुए और उनकी आगामी पीढ़ी–अग्रसारण का कार्य प्रगति पर है।

मक्का में एफ्लाटॉक्सिन प्रबंधन पर अनंतिम पेटेंट

अनुकूलशील कवक–निरोधी उपचार (Adaptive Fungistatic Treatment) द्वारा अनाज में माइकोटॉक्सिन संदूषण की रोकथाम के लिए एक कटाई–उपरांत जोखिम प्रबंधन प्रणाली हेतु अनंतिम पेटेंट दाखिल किया गया। IIMR का सुप्रेस्सोर फार्मुलेशन प्रयोगशाला एवं भण्डारण परीक्षणों में उत्कृष्ट क्रियाशीलता दर्शाई और अनुपचारित अनाज की तुलना में एफ्लाटॉक्सिन संचयन में उल्लेखनीय कमी आई।

फसल उत्पादन

प्रौद्योगिकी सक्षम संसाधन प्रबंधन के अन्तर्गत्त विविधीकत फसल-चक्र प्रणालियां

पारम्परिक धान–गेहूँ प्रणाली से सात विविधीकृत फसल–चक्र प्रणालियों की तुलना करने वाले एक क्षेत्र–प्रयोग से यह स्पष्ट हुआ कि लगभग सभी विकल्पों ने उत्पादकता में सुधार किया। भूमिगत ड्रिप सिंचाई, परिशुद्ध पोषण प्रबंधन एवं अवशेष–प्रतिधारण से युक्त मक्का–आधारित प्रणालियों ने सिंचाई जल–उपयोग एवं ऊर्जा–खपत को घटाते हुए समग्र तंत्र–उत्पादकता में वृद्धि की।

मक्का-आधारित फसल-चक्र प्रणालियाँ

खरीफ परिस्थितियों में मक्का–आधारित उपचारों ने उत्पादकता, जैवभार एवं कटाई–सूचकांक में धान–आधारित प्रणाली की तुलना में श्रेष्ठ प्रदर्शन किया। विश्लेषण से यह भी ज्ञात हुआ कि संरक्षण–कृषि दृष्टिकोण तथा मक्का–गेहूँ–मूँग का संयोजन बेहतर संसाधन–उपयोग के साथ अधिक आर्थिक लाभ प्रदान कर सकता है।

समेकित जिंक पोषण

तीन मक्का संकरों ने संयुक्त मूलाधारी एवं पर्णीय जिंक अनुप्रयोग पर सकारात्मक प्रतिक्रिया। सर्वोत्तम उपचार–संयोजन परागकिया दिखाई ने सर्वाधिक उपज अर्जित की और IMH 228 समस्त उपचारों में सर्वाधिक जिंक–अनुक्रियाशील संकर रहा।

क्षेत्र उपज एंव तनाव आकलन के लिए छवि-विश्लेषण

छवि–आधारित क्षेत्र, उपज एवं तनाव–आकलन को समर्थन देने के लिए जिलेवार मक्का क्षेत्र एवं उत्पादकता आँकड़ों का विश्लेषण किया गया। इस अध्ययन ने बड़े मौसमी एवं क्षेत्रीय अन्तरों को उजागर किया, जिससे यह स्पष्ट हुआ कि वसंत मक्का की उत्पादकता सर्वाधिक रही तथा सिंचित प्रणालियाँ सामान्यतः अधिक स्थिर रहीं।

उत्तम उत्पादन पदातियाँ

यन्त्रचालित बुआई एवं समय पर बुआई को मक्का की उच्चतर उत्पादकता एवं लाभप्रदता की कुञ्जी के रूप में चिह्नित किया गया। निष्कर्षों में मक्का की उपज–क्षमता को पूर्णतः साकार करने के लिए उन्नत बीज, सन्तुलित

पोषण, दक्ष जल एवं खरपतवार प्रबंधन तथा समेकित कीट प्रबंधन के उपयोग पर बल दिया गया।

फसल सुरक्षा

मेडिस पर्णीय झुलसन

पंजाब एवं हरियाणा से कुल 62 रोगग्रस्त पत्तियों के नमूने संग्रहीत किए गए, जिनसे 35 पृथकिकाएँ (Isolates) शुद्ध कर संरक्षित की गईं। पृथकिकाओं में आकारिकीय विविधता दर्ज की गई तथा रोगविज्ञान अध्ययनों के लिए प्रतिरोधी एवं ग्राही मक्का जीनोटाइप को बनाए रखा गया।

टर्सिकम पर्णीय झुलसन

चार E-serohilum पृथकिकाओं को आणविक स्तर पर अभिलक्षणित किया गया और ये E- turcicum के स्थान पर E- rostratum के साथ समूहित हुईं। कोख की अभिधारणाओं (Koch*s Postulates) ने भारत में मक्का के टर्सिकम पर्णीय झुलसन के कारक जीव के रूप में E-rostratum की पुष्टि की।

चित्तीदार तना छेदक

कृत्रिम संक्रमण के अन्तर्गत व्यापक छनाई से 32 मध्यम प्रतिरोधी जीनोटाइप की पहचान हुई, यद्यपि कोई भी पूर्णतः प्रतिरोधी नहीं पाया गया। इस कार्य ने भावी प्रतिरोध–प्रजनन के लिए उपयोगी जर्मप्लाज्म उपलब्ध कराया।

गुलाबी तना छेदक

168 अंतःप्रजनित वंशक्रमों की छनाई की गई और CML 337, DHO-82-7, MIL 2-154-1 एवं MIL-2-1721-3 जैसे अनेक जीनोटाइप ने गुलाबी तना छेदक के प्रति आशाजनक अथवा मध्यम प्रतिरोध प्रदर्शित किया।

फॉल आर्मीवर्म

रबी 2024–25 एवं खरीफ 2025 में फॉल आर्मीवर्म प्रतिरोध के लिए मक्का वंशक्रमों एवं जीनोटाइप के एक विस्तृत समूह की छनाई की गई। अनेक आशाजनक वंशक्रमों की पहचान हुई तथा प्रेरित–रक्षा (Induced Defense) अध्ययनों ने प्रतिरोधी जीनोटाइप में सशक्त फेनोलिक एवं हाइड्रॉक्सीसिन्नेमिक अम्ल अनुक्रिया दर्शाई।

प्रसार एवं जन-सम्पर्क

प्रसार एवं जन-सम्पर्क कार्यक्रम

संस्थान ने अग्रपंक्ति प्रदर्शन (FLD), अनुसूचित जनजाति घटक (STC), पूर्वोत्तर पर्वतीय क्षेत्र (NEH), अनुसूचित जाति उप–योजना (SCSP), कृषि व्यवसाय ऊष्मायन (ABI), कृषि–ड्रोन एवं अन्य परियोजनाओं के माध्यम से एक व्यापक प्रसार–दायित्व का निर्वहन किया। इन कार्यक्रमों ने अनेक राज्यों एवं क्षेत्रों के कृषकों, कृषक उत्पादक संगठनों (FPO) एवं हितधारकों के साथ अनुसंधान–परिणामों का सेतु बनाया।

NFSM के अन्तर्गत अग्रपंक्ति प्रदर्शन

अग्रपंक्ति प्रदर्शनों ने रबी 2024–25 में 1,388 हेक्टेयर, वसंत 2025 में 337 हेक्टेयर तथा खरीफ 2025 में 1,731. 19 हेक्टेयर को आच्छादित किया, जिससे कुल 7,809 कृषक लाभान्वित हुए। किसानों की प्रचलित पद्धतियों की तुलना में उपज–वृद्धि रबी में 16.89 प्रतिशत से लेकर खरीफ में 38.19 प्रतिशत तक रही, जो उन्नत संकरों एवं प्रबंधन पद्धतियों के व्यावहारिक प्रभाव को प्रमाणित करती है।

अनुसूचित जनजाति घटक

STC के अन्तर्गत, रबी 2024–25 में 141.6 हेक्टेयर, वसंत 2025 में 15 हेक्टेयर तथा खरीफ 2025 में 569.8 हेक्टेयर में अग्रपंक्ति प्रदर्शन आयोजित किए गए, जिससे देश भर के जनजातीय कृषक लाभान्वित हुए। प्रशिक्षण, क्षेत्र–दिवस एवं कृषि–आदान वितरण ने जनजातीय क्षेत्रों में मक्का को अपनाने की प्रवृत्ति को और सुदृढ़ किया।

अनुसूचित जाति उप-योजना

SCSP के अन्तर्गत रबी 2024–25, वसंत 2025 एवं खरीफ 2025 के दौरान 220 हेक्टेयर में उन्नत मक्का प्रौद्योगिकियों का प्रदर्शन किया गया, जिससे 573 कृषक प्रत्यक्ष रूप से लाभान्वित हुए। अतिरिक्त प्रशिक्षणों, क्षेत्र–दिवसों एवं आदान–सहायता के माध्यम से एक हजार से अधिक लाभार्थियों तक पहुँच बनाई गई तथा उन्नत उत्पादन पद्धतियों को अपनाने को प्रोत्साहन दिया गया।

पूर्वोत्तर पर्वतीय क्षेत्र कार्यक्रम

NEH घटक के अन्तर्गत अग्रपंक्ति प्रदर्शनों ने 352.4 हेक्टेयर को आच्छादित किया और 1,019 कृषकों को लाभान्वित किया। प्रत्येक ऋतु में उपज–वृद्धि दर्ज की गई तथा कार्यक्रम के अन्तर्गत बीज, उर्वरक, जैव–उर्वरक, पादप–संरक्षण आदान एवं कृषि–उपकरणों का वितरण भी किया गया।

जैव-इथेनॉल अभिग्रहण क्षेत्र परियोजना

जैव–इथेनॉल अभिग्रहण क्षेत्रों में मक्का उत्पादन संवर्धन परियोजना के अन्तर्गत 2024–25 एवं 2025 के दौरान

3,010 अग्रपंक्ति प्रदर्शन आयोजित किए गए। कुल 262 प्रसार कार्यक्रमों ने 9,244 कृषकों एवं हितधारकों तक पहुँच बनाई, जिससे जैव–इथेनॉल उद्योगों के लिए मक्का–आधारित फीडस्टॉक की आपूर्ति–श्रृंखला सुदृढ़ हुई।

साइलेज मूल्य-श्रृंखला परियोजना

पंजाब एवं हरियाणा में साइलेज परियोजना प्रदर्शनों, प्रसंस्करण अवसंरचना एवं कृषक–प्रशिक्षण का विस्तार किया। साइलेज उपयुक्तता के लिए संकर मूल्यांकन, गट्ठर–निर्माण (Baling) संचालन एवं क्षेत्रीय प्रशिक्षण ने वर्षभर पशु–आहार की उपलब्धता एवं मूल्य–श्रृंखला विकास में उल्लेखनीय सुधार लाया।

मक्का पर अखिल भारतीय समन्वित अनुसंधान परियोजना (AICRP)

AICRP खरीफ 2024 की प्रजनन सारांश

खरीफ 2024 के दौरान NIVT, AVT-I एवं AVT-II में 405 फील्ड कॉर्न प्रविष्टियों का मूल्यांकन किया गया और 69 प्रविष्टियाँ NIVT से AVT&I में प्रोन्नत हुईं। फच्ड, विशेष मक्का एवं अन्य सामग्री का भी विभिन्न क्षेत्रों में परीक्षण किया गया, जिससे राष्ट्रीय बहु–स्थानीय प्रजनन–श्रृंखला निरन्तर बनी रही।

AICRP रबी 2024–25 की प्रजनन सारांश

रबी 2024–25 में बहु–स्थानीय मूल्यांकन के लिए 142 प्रविष्टियाँ प्राप्त हुईं, जिनमें सामान्य मक्का, QPM, स्वीट कॉर्न, बेबी कॉर्न, पॉपकॉर्न एवं स्टार्च प्रकार सम्मिलित थे। परीक्षणों में विभिन्न क्षेत्रों में प्रजनन, रोगविज्ञान एवं कीटविज्ञान घटक शामिल थे।

AICRP खरीफ 2025 की प्रजनन सारांश

खरीफ 2025 के दौरान अल्प, मध्यम एवं दीर्घ परिपक्वता समूहों, QPM, स्वीट कॉर्न, बेबी कॉर्न, पॉपकॉर्न, OPV, वर्षा–आश्रित तथा उच्च Fe/Zn परीक्षणों में 404 प्रविष्टियों का मूल्यांकन किया गया। छर्भ एवं अन्य क्षेत्रों में 49 प्रजनन परीक्षण स्थापित किए गए।

पादप रोगविज्ञान – खरीफ 2024

NHZ में कुल 108 एवं शेष क्षेत्रों में 359 प्रविष्टियों की TLB, MLB, BLSB, चारकोल रॉट, BSR, SDM एवं FSR जैसी प्रमुख बीमारियों के विरुद्ध छनाई की गई। विभिन्न क्षेत्रों एवं फसल–प्रकारों के लिए आशाजनक प्रतिरोधी प्रविष्टियों की पहचान की गई।

पादप रोगविज्ञान – रोग प्रबंधन परीक्षण

बहु–स्थानीय फफूँदनाशी परीक्षणों से यह स्पष्ट हुआ कि स्ट्रोबिल्यूरिन–ट्राइएजोल सूत्रीकरण (Strobilurine--Triazole Formulations) सामान्यतः MLB, TLB, BLSB, रस्ट एवं FSR के विरुद्ध अधिक प्रभावी रहे। Metarhizium anisopliae समृद्ध वर्मीकम्पोस्ट के उपयोग से मक्का सिस्ट सूत्रकृमि के जैविक नियन्त्रण ने अनाज उपज में भी सुधार किया।

पादप रोगविज्ञान – रबी 2024–25 एवं वसंत 2025

रबी 2024–25 एवं वसंत 2025 के दौरान NEPZ, PZ, CWZ एवं NWPZ में प्रमुख रोगों के विरुद्ध क्रमशः 142 एवं 52 प्रविष्टियों की छनाई की गई। केवल अल्प संख्या में प्रविष्टियों में स्पष्ट प्रतिरोध परिलक्षित हुआ, जिससे रोग–प्रतिरोध के लिए निरन्तर चयन की आवश्यकता और अधिक रेखांकित हुई।

कीट विज्ञान – खरीफ 2024

विभिन्न अभिताप–स्थलों पर चित्तीदार तना छेदक एवं फॉल आर्मीवर्म के विरुद्ध कुल 135 प्रविष्टियों की छनाई की गईय कोई भी दोनों के प्रति प्रतिरोधी नहीं पाई गई। प्रबंधन अध्ययनों में प्रभावी कीटनाशकों, पारम्परिक कृषि–ज्ञान आधारित उपचारों (ITK) तथा लोबिया अन्तःफसल एवं एन्टोमोपैथोजेनिक निमेटोड (EPN) छिड़काव जैसे अरासायनिक विकल्पों की पहचान की गई।

कीट विज्ञान – फॉल आर्मीवर्म प्रबंधन

2025 के दौरान कीटनाशक एवं अरासायनिक मूल्यांकनों ने FAW प्रबंधन के लिए नवीन अणुओं एवं पारिस्थितिकी–आधारित दृष्टिकोणों की प्रभावशीलता की पुष्टि की। AICRP केन्द्रों पर फेरोमोन–प्रपंच, कीट–अनुक्रमण निगरानी एवं उपज–हानि आकलन का कार्य अनवरत जारी रहा।

कीट विज्ञान – रबी 2024–25 एवं वसंत 2025

रबी 2024–25 एवं वसंत 2025 में गुलाबी तना छेदक, चित्तीदार तना छेदक, फॉल आर्मीवर्म एवं प्ररोह मक्खी के लिए 38 प्रविष्टियों की का मूल्यांकन किया गर्या। कोई भी प्रविष्टि समस्त लक्षित कीटों के प्रति प्रतिरोधी नहीं पाई गई, तथापि कुछ आशाजनक वंशक्रमों ने उपयोगी प्रतिरोध –स्तर प्रदर्शित किए, जो भावी प्रजनन कार्य में सहायक सिद्ध होंगे।

Executive Summary

This executive summary condenses Chapters 1–6 of the attached report into short chapter-wise notes with the sub-headings retained in shortened form. The emphasis is kept on the results, entries, locations and activities reported in the document, without adding new themes or interpretations.

Crop Improvement

Hybrids released by the institute

Four field corn hybrids, IMH 232, IMH 233, IMH 234 and IMH 235, were released for different agro-climatic zones. IMH 232 was suited to kharif in Eastern UP, Bihar, Jharkhand, Odisha and West Bengal; IMH 233 was recommended for spring in the NWPZ; IMH 234 covered kharif adaptation in the NEPZ and PZ; and IMH 235 was released for rabi in the NEPZ. All four showed yield superiority over the relevant checks and carried moderate resistance to stem borers, fall armyworm and major foliar/stalk diseases, along with lodging tolerance and response to higher inputs.

QPM hybrids notified

Nine QPM hybrids, IQMH 206 to IQMH 214, were notified for cultivation in different zones. They combined grain yield with high lysine and tryptophan content, and several entries also carried moderate resistance to major diseases and stem borers. The hybrids expanded the institute's nutritionally improved maize pipeline across the NEPZ, NWPZ, CWZ, NHZ and PZ.

Baby corn hybrids notified

IBCH 403 was notified as a CMS-based baby corn hybrid with wide adaptation, early maturity and 3–4 pickings, while IBCH 402 was further identified for area expansion. Both hybrids produced high baby corn yield and fodder yield, reduced labour through elimination of detasseling, and showed useful resistance to leaf blights and stem borer.

Hybrids promoted in AICRP

Several field corn entries advanced from NIVT and AVT-I to higher stages of testing, including IMH 2-22K-13 in Bihar and two field corn entries in the AICRP Kharif 2024 table. Nine QPM hybrids were also promoted for testing in Kharif 2025, while one CMS-based baby corn hybrid, IBH 11-243, advanced from NIVT to AVT-I. White maize entries from Gujarat and Jammu and Kashmir also moved forward in state trials.

Field corn germplasm development

A set of 150 segregating inbred lines was advanced from C6 to C7 through selfing and hand pollination, with yield potential ranging from 1.8 to 4.6 t/ha. Heterotic grouping populations were also advanced at Begusarai and Ludhiana to create improved breeding material for future hybrid development.

Evaluation of experimental hybrid

A large set of line × tester and diallel experimental hybrids was evaluated under normal environments at Ludhiana and Begusarai. Several hybrids out-yielded the best checks, showing that the crossing programme is generating high-performing combinations for future advancement.

Evaluation of diallel experimental hybrids at Ludhiana

At IIMR, Ludhiana, 55 diallel hybrids were evaluated during Kharif 2024. The best performers exceeded the standard checks, with IMH 2-24K-18 recording the highest grain yield and strong superiority over the best check.

Evaluation of diallel experimental hybrids at Begusarai

At RMR&SPC, Begusarai, 55 diallel hybrids were tested during Rabi 2024–25. Although the trial was laid late and overall expression was lower, six experimental hybrids still out-yielded the best check, with IMH 2-24R-38 ranking first.

Evaluation of white maize hybrids

Two hundred white maize crosses were assessed at Ludhiana during spring 2025, and several hybrids exceeded the best check. Additional white maize sets evaluated during kharif 2024 also produced superior hybrids, supporting the breeding line for specialized white maize cultivation.

Screening maize germplasm for abiotic stress

Salinity screening at the IIWBR regional station identified genotypes such as IMH 223, III363 and 111391 as promising under saline conditions. The evaluation also showed that severe heat stress affected seed set in some entries, reinforcing the need for stress-tolerant maize materials.

Waterlogging stress evaluation

Nine recently released field corn hybrids were screened under waterlogging at Ludhiana. Five hybrids, including IMH 225 and IMH 222, out-yielded the best check, and IMH 225 was the top performer with 6.714 t/ha and nearly 30% superiority.

Screening maize germplasm for biotic stress

A set of 61 inbred lines was screened against fall armyworm and pink stem borer during Rabi 2024–25. MIL2-100 and MIL 2-325-1 showed promising resistance to fall armyworm, while MIL 2-154-1 and MIL 678-1 were resistant to pink stem borer.

TLB resistance inheritance

A half-diallel population was developed from resistant and susceptible parents to study genetic inheritance of Turcicum leaf blight resistance. The material was evaluated under artificial epiphytotic conditions at Mandya and Dharwad, and the analysis showed substantial genetic variability for resistance.

Wild species for fodder and silage maize

A maize wild relative block was established and wild relatives were maintained for conservation and use in breeding. Wild crosses, doubled haploids and segregating generations were advanced to enrich the breeding base for fodder, silage and stress traits.

Silage maize evaluation

Silage-oriented hybrids were evaluated across seasons for biomass and quality traits. Promising entries, including IMH 222, IMH 225 and other hybrids, showed strong biomass and nutritive performance, while several entries were selected for biochemical and digestibility analysis.

Breeding for quality traits

Breeding work targeted starch, ethanol recovery, aflatoxin management, zinc, iron, lysine, tryptophan and protein quality. High-starch hybrids and extractable-starch materials were identified for ethanol use, and a suppressor formulation showed strong potential for reducing aflatoxin contamination in stored maize grain.

High-starch maize and ethanol recovery

A large screening programme identified hybrids with extractable starch above 62%, and a set of elite hybrids combined high grain yield with high starch content. Process-optimization work also supported better ethanol recovery and safer DDGS quality.

Meta-QTL analysis for high-starch maize

Meta-QTL analysis identified stable genomic regions for starch content, drought tolerance and waterlogging tolerance. These hotspot regions provide useful targets for marker-assisted breeding and climate-resilient bioethanol maize.

High zinc and QPM

Stable MQTLs were identified for grain zinc, iron, protein content and protein quality. Transcriptome work validated candidate genes, and genome editing of HRZ orthologues was initiated to enhance Fe and Zn accumulation.

Multi-trait quality lines

Multi-trait quality inbred lines combining high protein, lysine, tryptophan, provitamin A and low phytic acid were developed. These materials strengthen the pipeline for nutritionally enhanced maize.

Promising protein quality lines

A set of inbred lines was evaluated for methionine, tryptophan and lysine content, and several promising lines were identified for further breeding use.

DH lines

New DH lines were developed and evaluated for per se performance, with several lines recording higher grain yield and useful breeding value.

Experimental QPM hybrids

One hundred and eleven experimental QPM hybrids were tested, and the best combinations showed clear superiority in grain yield, supporting continued advancement of the QPM breeding pipeline.

Basic Sciences

Developing improved maize plant types using genome editing tools

Five CRISPR/Cas9 constructs were developed targeting SBEII, FBL41, ALS, KRN2 and RAVL1 to improve starch composition, resistance to banded leaf and sheath blight, herbicide tolerance, kernel number, yield and plant architecture. The constructs were assembled, transformed into embryogenic calli, and validated molecularly, with T0 plants generated for some targets and further generation advancement underway.

Provisional patent on aflatoxin management in maize

A provisional patent was filed for a post-harvest risk management system to prevent mycotoxin contamination in cereal grains through adaptive fungistatic treatment. The IIMR suppressor formulation showed superior activity in laboratory and storage trials, with strong reduction in aflatoxin accumulation compared with untreated grain.

Crop Production

Diversified cropping systems under technology--enabled resource management

A field experiment comparing seven diversified cropping systems with the conventional rice–wheat system showed that almost all alternatives improved productivity. Maize-based systems integrated with subsurface drip irrigation, precision nutrients and residue retention raised system productivity while reducing irrigation water use and energy consumption.

Maize-based cropping systems

Under kharif conditions, maize-based treatments outperformed the rice-based system in productivity, biomass and harvest index. The analysis showed that conservation-agriculture approaches and maize–wheat–mungbean combinations can deliver higher returns with better resource use.

Integrated zinc fertilization

Three maize hybrids responded positively to combined basal and foliar zinc application. The best treatment combination produced the highest yields, and IMH 228 was the most zinc-responsive hybrid across treatments.

Image analysis for area, yield and stress estimation

District-wise maize area and productivity data were analyzed to support image-based area, yield and stress estimation. The work highlighted major seasonal and regional differences, showing that spring maize had the highest productivity and that irrigated systems were generally more stable.

Best production practices

Mechanized planting and timely sowing were identified as key to higher maize productivity and profitability. The findings emphasized the use of improved seed, balanced nutrition, efficient water and weed management, and integrated pest management to unlock maize yield potential.

Crop Protection

Maydis leaf blight

A total of 62 diseased leaf samples were collected from Punjab and Haryana, from which 35 isolates were purified and preserved. Morphological variation among isolates was recorded, and resistant/susceptible maize genotypes were maintained for pathological studies.

Turcicum leaf blight

Four *Exserohilum* isolates were molecularly characterized and clustered with *E. rostratum* rather than *E. turcicum*. Koch's postulates confirmed *E. rostratum* as the causal agent of turcicum leaf blight in maize in India.

Spotted stem borer

Large-scale screening under artificial infestation identified 32 moderately resistant genotypes, although none were fully resistant. The work provided useful germplasm for future resistance breeding.

Pink stem borer

One hundred sixty-eight inbred lines were screened, and several genotypes, such as CML 337, DHO-82-7, MIL 2-154-1 and MIL-2-1721-3 showed promising resistance or moderate resistance to pink stem borer.

Fall armyworm

A broad set of maize inbreds lines and genotypes was screened for fall armyworm resistance in *Rabi* 2024–25 and *Kharif* 2025. Several promising lines were identified, and induced defense studies showed strong phenolic and hydroxycinnamic acid responses in resistant genotypes.

Extension and Outreach

Extension and outreach programmes

The institute continued a broad extension mandate through FLDs, STC, NEH, SCSP, ABI, Agri-Drone and other projects. These programmes linked research outputs with farmers, FPOs and stakeholders across multiple states and regions.

Frontline demonstration under NFSM

Frontline demonstrations covered 1,388 ha in Rabi 2024–25, 337 ha in spring 2025 and 1,731.19 ha in kharif 2025, benefiting 7,809 farmers in total. Yield gains over farmer practices ranged from 16.89% in Rabi to 38.19% in kharif, demonstrating the impact of improved hybrids and management practices.

Scheduled Tribe Component

Under STC, FLDs were conducted on 141.6 ha in Rabi 2024–25, 15 ha in spring 2025 and 569.8 ha in kharif 2025, benefiting tribal farmers across the country. Training, field days and input distribution further strengthened maize adoption in tribal areas.

Scheduled Caste Sub Plan

Under SCSP, improved maize technologies were demonstrated on 220 ha during Rabi 2024–25, spring 2025 and kharif 2025, benefiting 573 farmers. Additional trainings, field days and input support reached over a thousand beneficiaries and supported adoption of improved production practices.

North Eastern Hill programme

Under the NEH component, FLDs covered 352.4 ha and benefited 1,019 farmers. The demonstrations recorded yield gains in each season, and the programme also distributed seed, fertilizers, biofertilizers, plant protection inputs and farm implements.

Ethanol catchment area project

The project on enhancement of maize production in ethanol catchment areas conducted 3,010 FLDs during 2024–25 and 2025. A total of 262 extension programmes reached 9,244 farmers and stakeholders, strengthening maize feedstock supply for ethanol industries.

Silage value chain project

The silage project in Punjab and Haryana expanded demonstrations, processing infrastructure and farmer training. Hybrid evaluation for silage suitability, baling operations and field training improved year-round feed availability and value-chain development.

AICRP on Maize

Breeding summary of AICRP *Kharif* 2024

During kharif 2024, 405 field corn entries were evaluated across NIVT, AVT-I and AVT-II, and 69 entries advanced from NIVT to AVT-I. QPM, specialty corn and other materials were also tested across zones, maintaining the national multi-location breeding pipeline.

Breeding summary of AICRP rabi 2024-25

In rabi 2024–25, 142 entries were received for multi-location evaluation, including normal maize, QPM, sweet corn, baby corn, popcorn and starch types. The trials comprised breeding, pathology and entomology components across zones.

Breeding summary of AICRP kharif 2025

During kharif 2025, 404 entries were evaluated across short, medium and long maturity groups, QPM, sweet corn, baby corn, popcorn, OPV, rainfed and high Fe/Zn trials. Forty-nine breeding trials were constituted across the NHZ and the other zones.

Plant pathology - *Kharif* 2024

A total of 108 entries in NHZ and 359 entries in the remaining zones were screened against major diseases, such as TLB, MLB, BLSB, charcoal rot, BSR, SDM and FSR. Promising resistant entries were identified for different zones.

Plant Pathology - disease management trials

Multi-location fungicide trials showed that strobilurine-triazole formulations were generally more effective against MLB, TLB, BLSB, rust and FSR. Biological control of maize cyst nematode using enriched vermicompost with *Metarhizium anisopliae* also improved grain yield.

Plant Pathology - *Rabi* 2024-25 and Spring 2025

During *Rabi* 2024–25 and Spring 2025, 142 and 52 entries were screened, respectively, against major diseases in NEPZ, PZ, CWZ and NWPZ. Only a small number of entries showed clear resistance, underlining the need for continued selection for disease resistance.

Entomology - *Kharif* 2024

A total of 135 entries were screened against spotted stem borer and fall armyworm across hotspot locations, and none were resistant to both. Management studies identified effective insecticides, ITK treatments and non-chemical measures such as cowpea intercropping and EPN sprays.

Entomology - management of fall armyworm

Insecticide and non-chemical evaluations during 2025 confirmed the efficacy of newer molecules and ecological approaches for FAW management. Pheromone trapping, pest succession monitoring and yield-loss estimation continued across AICRP locations.

Entomology - *Rabi* 2024-25 and Spring 2025

In *Rabi* 2024–25 and Spring 2025, 38 entries were screened for pink stem borer, spotted stem borer, fall armyworm and shoot fly. No entry was found resistant against targeted pests, although a few promising lines showed useful resistance levels and will support future breeding.

CHAPTER-1

CROP IMPROVEMENT

The major activities under crop improvement include, development of high yielding maize hybrids, improvement of parental lines, germplasm enhancement for resistance to biotic and abiotic stresses and improvement of quality traits to meet the changing climate and market demand.

Hybrids released/notified by the institute

Four field corn hybrids IMH 232 (IMHSB 20K-11) and IMH 233 (IMHSB 20R10), IMH 234 (IMHSB 20-3) and IMH 234 (IMHSB 20R-11) were developed. These hybrids were released by the **93rd** meeting of Central Sub-Committee on Crop Standards, Notification and Release of Varieties for Agricultural Crops (CSS on CSN&R VAC) and notified vide Gazette Notification no. S.O 6123(E) Dt: 31-12-2025.

IMH 232: This is a medium maturity single cross field corn hybrid for cultivation during kharif season in Eastern UP, Bihar, Jharkhand, Orissa and west Bengal. It has grain yield of 6.724 t/ha and has shown yield superiority (7.66%) over the relevant best check in North Eastern Plains Zone. This hybrid has cylindrical long ears with semi-dent yellow kernels, moderately resistant to Stem borer (Chilo partellus) and Fall armyworm (Spodoptera frugiperda) insects. This hybrid is also moderately resistant to Maydis leaf blight, Charcoal rot and Turcicum leaf blight and Fusarium Stalk Rot (FSR) diseases. The hybrid is tolerant to lodging and responsive to higher inputs.

IMH 233: This is a medium maturity single cross field corn hybrid released for cultivation during Spring season in NWPZ comprising the states of Punjab, Haryana, Western UP, Plains of Uttarakhand and Delhi NCR. It has grain yield of 9.826 t/ha and has shown yield superiority (7.21%) over the relevant best check in North Western Plains Zone. This hybrid has Conico-cylindrical semi-dent yellow kernels, moderately resistant to Stem borer (Chilo partellus), Pink stem borer, (Sesamia inferens) and Fall armyworm (Spodoptera frugiperda) insects. This hybrid is also moderately resistant to Maydis leaf blight, Charcoal rot, Turcicum leaf blight and Fusarium Stalk Rot (FSR) diseases. The hybrid responsive to higher inputs.

IMH 234: This is a medium maturity single cross field corn hybrid for cultivation during kharif season in NEPZ (Eastern UP, Bihar, Jharkhand, Orissa and west Bengal) and PZ (Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Telangana). It has grain yield of 9.345 t/ha with 26.55 % yield superiority over relevant check in North Eastern Plains Zone and 10.252 t/ha with 12.85 % yield superiority (7.66%) over the relevant best check in Peninsular Zone. This hybrid has Conico-cylindrical long ears with semi-dent yellow kernels, moderately resistant to Stem borer (Chilo partellus), Pink stem borer, (Sesamia inferens) and Fall armyworm (Spodoptera frugiperda) insects. This hybrid is also moderately resistant to Maydis leaf blight, Charcoal rot, Turcicum leaf blight and Fusarium Stalk Rot (FSR) diseases. The hybrid is tolerant to lodging and responsive to higher inputs.

IMH 235: This is a medium maturity single cross field corn hybrid for cultivation during Rabi season in NEPZ comprising the states of Eastern UP, Bihar, Jharkhand, Orissa and west Bengal). It has grain yield of 9.253 t/ha with 25.53 % yield superiority over relevant check in North Eastern Plains Zone. This hybrid has Conico-cylindrical long ears with semi-dent yellow kernels, moderately resistant to Stem borer (Chilo partellus), Pink stem borer, (Sesamia inferens) and Fall armyworm (Spodoptera frugiperda) insects. This hybrid is also moderately resistant to Maydis leaf blight and Turcicum leaf blight diseases. The hybrid is tolerant to lodging and responsive to higher inputs.

QPM Hybrids notified

Nine QPM hybrids namely IQMH 206, IQMH 207, IQMH 208, IQMH 209, IQMH 210, IQMH 211, IQMH 212, IQMH 213 & IQMH 214 have been notified.

IQMH 206: This hybrid has been recommended for cultivation in Zone III (North-Eastern Plain Zone) including the states Bihar, Jharkhand, Odisha, West Bengal and Eastern UP. The hybrid recorded the yield of 5757 kg/ha in the identified zone.

IQMH 207: This hybrid has been recommended for cultivation in Zone III (North-Eastern Plain Zone) including the states Bihar, Jharkhand, Odisha, West Bengal and Eastern UP and Zone II (North-Western Plain Zone) including Punjab, Haryana, Western UP, Delhi and Plains of Uttarakhand. The hybrid recorded the yield of 5919 kg/ha in Zone III and 8174 kg/ha in Zone-II.

IQMH 208: This hybrid has been recommended for cultivation in Zone V (Central Western Zone) including the states Rajasthan, Madhya Pradesh, Gujrat and Chhattisgarh. The hybrid recorded the yield of 6791 kg/ha in the identified zone.

IQMH 209: This hybrid has been recommended for cultivation in Zone I (Northern Hill Zone) including the states Jammu & Kashmir, HP, Hilly area of Uttarakhand, Meghalaya, Assam, Mizoram, Arunachal Pradesh, Tripura, Nagaland, Sikkim. The hybrid recorded the yield of 7352 kg/ha in the identified zone. The hybrid was moderately resistant to TLB (4.03) and moderately resistant to Chilo partellus (3.60). The hybrid recorded high tryptophan (0.78% of protein content) and lysine content (3.28%).

IQMH 210: This hybrid has been recommended for cultivation in Zone II (North-Western Plain Zone) including Punjab, Haryana, Western UP, Delhi and Plains of Uttarakhand. The hybrid recorded the yield of 8473 kg/ha in Zone II. The hybrid is moderately resistant to MLB (4.6) and BLSB (5.0), and moderately resistant to Chilo partellus (4.1). The hybrid recorded high tryptophan (0.85% of protein content) and lysine content (4.07%).

IQMH 211: This hybrid has been recommended for cultivation in Zone III (North-Eastern Plain Zone) including the states Bihar, Jharkhand, Odisha, West Bengal and Eastern UP and Zone V (Central Western Zone) including the states Rajasthan, Madhya Pradesh, Gujrat and Chhattisgarh. The hybrid recorded the yield of 6860 kg/ha in Zone III and 7318 kg/ha in Zone-II. The hybrid is moderately resistant to BLSB (4.2), and moderately resistant to Chilo partellus (4.4). The hybrid recorded high tryptophan (0.82% of protein content) and lysine content (3.52%).

IQMH 212: This hybrid has been recommended for cultivation in Zone IV (Peninsular Zone) including the states Maharashtra, Karnataka, Telengana, Andhra Pradesh, Tamil Nadu and Zone V (Central Western Zone) including the states Rajasthan, Madhya Pradesh, Gujrat and Chhattisgarh. The hybrid recorded the yield of 9385 kg/ha in Zone IV and 7738 kg/ha in Zone-V. The hybrid is moderately resistant to Charcoal Rot (3.5), CLS (5.0) and FSR (4.6) and moderately resistant to Chilo partellus (4.2). The hybrid recorded high tryptophan (0.87% of protein content) and lysine content (3.98%).

IQMH 213: This hybrid has been recommended for cultivation in Zone III (North-Eastern Plain Zone) including the states Bihar, Jharkhand, Odisha, West Bengal and Eastern UP. The hybrid recorded the yield of 7136 kg/ha in Zone III. The hybrid is moderately resistant to Charcoal Rot (4.03) and FSR (4.6), and moderately resistant to Chilo partellus (4.28). The hybrid recorded high tryptophan (0.82% of protein content) and lysine content (3.79%).

IQMH 214: This hybrid has been recommended for cultivation in Zone III (North-Eastern Plain Zone) including the states Bihar, Jharkhand, Odisha, West Bengal and Eastern UP and Zone V (Central Western Zone) including the states Rajasthan, Madhya Pradesh, Gujrat and Chhattisgarh. The hybrid recorded the yield of 6030 kg/ha in Zone III and 7050 kg/ha in Zone-V. The hybrid is moderately resistant to MLB and BLSB. The hybrid recorded high tryptophan (0.91% of protein content) and lysine content (3.91%).

Baby corn hybrids notified

IBCH 403: It is a CMS-based baby corn hybrid developed from the parentage IML 108 × HKI 323, identified in 2025 and notified vide Gazette Notification No. S.O. 6123(E), S. No. 92 dated 31-12-2025. It is recommended for cultivation in a wide range of agro-climatic zones including the Northern Hill Zone (Jammu & Kashmir, Himachal Pradesh, Uttarakhand hills), North Eastern Hill Regions (Meghalaya, Sikkim, Assam, Tripura, Nagaland, Manipur and Arunachal Pradesh), North Eastern Plain Zone (Odisha, Jharkhand, Bihar, Eastern Uttar Pradesh and West Bengal), Peninsular Zone (Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Telangana) and Central Western Zone (Rajasthan, Gujarat, Madhya Pradesh and Chhattisgarh), and is suitable for *Kharif* season as well as year-round cultivation. The hybrid is early maturing and ready for harvest within 60–65 days, giving 3–4 pickings. It recorded high baby corn yield (without husk) of 1856 kg/ha in NHZ, 2219 kg/ha in NEPZ, 1716 kg/ha in PZ and 1689 kg/ha in CWZ, along with a high fodder yield of 220–260 q/ha. Being a CMS-based hybrid, it eliminates the need for detasseling, reducing labor cost, and possesses desirable quality traits such as white, creamy, and straight-arranged ovules. It is moderately resistant to Turcicum Leaf Blight (TLB), Maydis Leaf Blight (MLB), and spotted stem borer, making it a high-yielding, cost-effective, and farmer-friendly hybrid for baby corn production.

IBCH 402: It is a baby corn hybrid developed from IML 103 × IML 127-1 and notified vide gazette notification S.O. 4388(E), Sl. No. 86 dated 8th October 2024 for the Northern Hill Zone (NHZ). It was further identified for release with area extension vide gazette notification S.O. 6130(E) (i) dated on 31st December, 2025 page 31in the Peninsular Zone (PZ) comprising Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Telangana, and the Central Western Zone (CWZ) comprising Rajasthan, Gujarat, Madhya Pradesh and Chhattisgarh, during the 68th AICRP on Maize (VIC) held at TNAU, Coimbatore in April 2025. The hybrid is suitable for *Kharif* and year-round cultivation, matures in 55–60 days, and recorded baby corn yields (without husk) of 1845 kg/ha in NHZ, 1622 kg/ha in PZ and 1655 kg/ha in CWZ, supporting its suitability for area.

Hybrids promoted under AICRP testing

Hybrid promoted in AICRP– Field corn

Hybrids promoted under AICRP and State trials

Table 1.1: Hybrid promoted in different AICRP trials

S. No.	Hybrid	Type of hybrid	Trial	Promoted to	Maturity	Zone	Yield (q/ha)	Sup. (%)
AICRP on maize Kharif-2024-Kharif-2025								
1	IMH 2-24K-6	Field Corn	NIVT	AVT-I	Medium	NEPZ (Zone 3)	7.213	0.13
2	IMH 2-24K-3	Field Corn	NIVT	AVT-I	Medium	CWZ (Zone-5)	6.452	0.50

A hybrid IMH 2-22K-13 completed three years in kharif SVT trials of Bihar and found superior to best check with 13.62% superiority with average yield 6.411 t/ha.

Hybrid promoted – QPM

Nine hybrids namely, IQPMH 2401, IQPMH 2402, IQPMH 2403, IQPMH 2404, IQPMH 2405, IQPMH 2406, IQPMH 2407, IQPMH 2408 & IQPMH 2409 have been promoted in different zones for testing during *Kharif*, 2025. The details of these hybrids are given below:

Table 1.2: QPM hybrids promoted in different AICRP trials

S. No.	Hybrid	Grain Yield (t/ha)		Advanced to AVT-I
		Hybrid	Best Check	
1	IQPMH 2401	6.678 8.729 6.275 9.270 6.000	LQMH 1 (6.380) Zone I IQMH 203 (7.502) Zone II IQMH 203 (6.020) Zone III IQMH 203 (8.660) Zone IV IQMH 203 (5.660) Zone V	AVT-I
2	IQPMH 2402	8.021 9.967 5.820	IQMH 203 (7.502) Zone II IQMH 203 (6.020) Zone III IQMH 203 (5.660) Zone V	AVT-I
3	IQPMH 2403	6.693 8.057 6.070 8.810 6.210	LQMH 1(6.380) Zone I IQMH 203 (7.502) Zone II IQMH 203 (6.020) Zone III IQMH 203 (8.660) Zone IV IQMH 203 (5.660) Zone V	AVT-I
4	IQPMH 2404	8.192 6.540 9.080 5.920	IQMH 203 (7.502) Zone II IQMH 203 (6.020) Zone III IQMH 203 (8.660) Zone IV IQMH 203 (5.660) Zone V	AVT-I
5	IQPMH 2405	6.753 8.465 6.120 8.950 6.380	LQMH 1 (6.380) Zone I IQMH 203 (7.502) Zone II IQMH 203 (6.020) Zone III IQMH 203 (8.660) Zone IV IQMH 203 (5.660) Zone V	AVT-I
6	IQPMH 2406	6.452 9.176	LQMH 1 (6.380) Zone I IQMH 203 (7.502) Zone II	AVT-I
7	IQPMH 2407	6.393 8.360 6.290 9.200 5.840	LQMH 1 (6.380) Zone I IQMH 203 (7.502) Zone II IQMH 203 (6.020) Zone III IQMH 203 (8.660) Zone IV IQMH 203 (5.660) Zone V	AVT-I
8	IQMH 2408	7.011 8.839 9.090 5.950	LQMH 1 (6.380) Zone I IQMH 203 (7.502) Zone II IQMH 203 (8.660) Zone IV IQMH 203 (5.660) Zone V	AVT-I
9	IQMH 2409	6.949 8.063 9.090 6.270	LQMH 1 (6.380) Zone I IQMH 203 (7.502) Zone II IQMH 203 (8.660) Zone IV IQMH 203 (5.660) Zone V	AVT-I

Hybrid promoted – Baby corn

During *Kharif* 2025, the hybrid IBH 11-243 (CMS based baby corn hybrid) was promoted from NIVT to AVT-I and evaluated in the BC-I-II-III trial in the Central Western Zone (CWZ). At the AVT-I stage, the hybrid recorded a yield of 1,757 kg ha^{-1}, showing a 13% superiority over the standard check. On the other hand, one CMS based baby corn hybrid IBH 11-251 contributed in *Kharif*, 2025 for NIVT.

Hybrid promoted in state trial– white maize

As white maize is widely grown in Gujrat, white hybrids were contributed for 3rd year testing in the state trial of Gujrat during kharif 2025. The hybrid IMH 10-23K2 recorded significantly higher yield than the check hybrid and was promoted for testing in kharif 2026. Further another white hybrid was contributed for testing in the state trial of Jammu and Kashmir. The hybrid IMH 10-24K3 recorded higher yield than the check hybrid and was promoted for second year testing.

Field corn germplasm development

Generation advancement of 150 segregating inbred lines from C6 to C7

A set of 150 S6 segregating inbred lines were advanced to S7 by selfing and hand pollination. The yield potential of inbred lines ranged from 1.8t/ha to 4.6 t/ha.

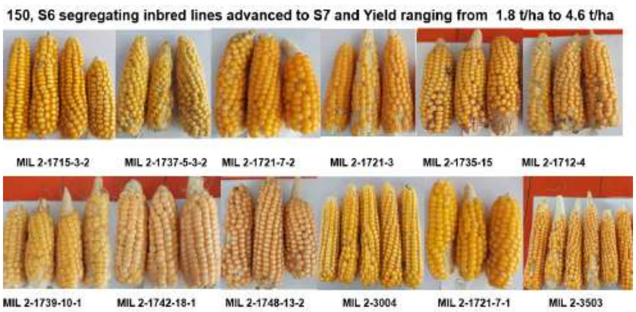


Figure 1.1: Ears of some high yielding advanced stage segregating inbred lines

Generation advancement of C_{1-2} & C_{2-3} populations during rabi 2024-25 at Begusarai and in Kharif-2025 at Ludhiana.

Ten set of heterotic grouping populations were advanced to next generation. Each set of 300-400 plants of each C1 populations during Rabi-2024-25 at Begusarai and each C2 population of 500 plants during kharif-2025 were advanced to next cycle as per plan given below:

Population Cycle	Season Location	Population	Normal		Drought		WL		Cold		Heat	
			Het-A	Het-B	Het-A	Het-B	Het-A	Het-B	Het-A	Het-B	Het-A	Het-B
C0	Spring-24 at LDH	10 rows	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM
C1	Kh-24 at LDH	50 plants	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM
C2	Rabi-24-25 at BGS	300-400 plants	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM
C3	Kh-25 at LDH	500 plants										
RM = random mating					DH Induction							

Figure 1.2: Heterotic grouping populations were generated and advanced to next generation

Evaluation of experimental hybrid

Evaluation of medium maturity L × T experimental hybrids under normal environment at IIMR, Ludhiana during Spring 2024.

A set of 225-line x tester experimental hybrids along with five checks was evaluated under normal environment during Spring-2024 at IIMR, Ludhiana. Twenty hybrids out yielded the best check hybrids DKC 9108 and eight hybrids yielded with >10% yield superiority over best check (Table 1.3).

Table 1.3: Performance of medium maturity L × T experimental maize hybrids during Spring-2024 at IIMR, Ludhiana

Name of hybrid	Pedigree	Anthesis	ASI	Maturity	Pl. Height	Selling %	GY (t/ha)	%Sup	Rank
IMH 02-24S-190	MIL 2-1710-2 × LM 14	83	3	123	246	84.3	14.951	26.13	1
IMH 02-24S-204	MIL 2-2039 × LM 14	83	3	116	228	83.0	14.852	25.29	2
IMH 02-24S-186	MIL 2-1704-3 × LM 14	83	4	123	193	81.7	14.611	23.25	3
IMH 02-24S-188	MIL 2-1708-2 × LM 14	83	3	123	213	85.8	14.253	20.24	4
IMH 02-24S-196	MIL 2-1736-5-4 × LM 14	82	3	121	228	81.2	14.234	20.07	5
IMH 02-24S-199	MIL 2-1744-6-2 × LM 14	82	4	123	214	81.1	14.009	18.18	6
IMH 02-24S-208	MIL 2-3010 × LM 14	81	4	121	234	84.8	13.668	15.30	7
IMH 02-24S-163	MIL 2-1292-2 × LM 14	81	3	114	232	85.9	13.344	12.57	8
IMH 02-24S-178	MIL 2-1530 × LM 14	83	4	120	223	82.6	13.035	9.96	9
IMH 02-24S-138	MIL 2-763-3 × LM 14	82	2	121	237	86.8	13.023	9.86	10
Check 5	Check 5 (DKC 9108)	80	3	123	225	79.7	11.854		
Check-4	Check 4 (DKC 7074)	79	4	120	206	82.6	10.581		
Check-3	Check 3 (Bio 605)	81	5	114	209	86.0	9.901		
Check-2	Check 2 (Bio 9544)	84	3	123	168	75.8	9.090		
Check-1	Check 1 (DHM 117)	84	5	123	210	81.1	5.319		
	Mean	82	3.1	116	211	0.8	7.5432		
	CV	5.29	12.80	5.69	8.94	11.89	15.680		
	CD	3.15	0.49	11.42	17.82	7.84	0.984		

Evaluation of diallel experimental hybrids under normal environment at IIMR, Ludhiana during *Kharif* 2024.

A set of 55-diallel experimental hybrids along with five checks was evaluated under normal environment during *Kharif*-2024 at IIMR, Ludhiana. The nineteen experimental hybrids out yielded the best check LG 34.05 and eight hybrids out yielded with >10% yield superiority over best check. The top-ranking hybrid IMH 2-24K-18 (MIL 2-801-1× MIL 2-406) reported grain yield of 9.879 t/ha (Table 1.4).

Table 1.4: Performance of medium maturity diallel experimental maize hybrids under normal environment during kharif-2024 at IIMR, Ludhiana

Entry name	Pedigree	Anthesis (d)	ASI (d)	Maturity (d)	Pl. height (cm)	Shelling %	Final Yield (t/ha)	% Sup. over BC	Rank
IMH 2-24K-18	MIL 2-801-1× MIL 2-406	49	3	97	229	85.4	9.879	19.67	1
IMH 2-24K-3	MIL 2-114-2 × MIL 2-1062-1-2	52	2	98	172	86.9	9.265	12.23	2
IMH 2-24K-58	MIL 2-1058-9-1 × BML 6	49	2	90	208	87.5	9.199	11.43	3
IMH 2-24K-25	MIL 2-1062-1-2 × LM13	52	2	94	223	87.3	9.188	11.30	4
IMH 2-24K-53	MIL 2-580 × BML 6	50	3	99	212	86.7	9.156	10.91	5
IMH 2-24K-52	MIL 2-579 × BML 6	51	2	100	154	79.3	9.151	10.86	6
IMH 2-24K-28	MIL 2-1289 × MIL 2-571-1	54	2	96	204	82.9	9.031	9.41	7
IMH 2-24K-63	MIL 2-1289-2 × BML 7	51	2	97	208	83.8	9.023	9.30	8
IMH 2-24K-21	MIL 2-883-1 × MIL 2-1299-5	49	2	92	218	87.9	9.003	9.06	9
IMH 2-24K-54	MIL 2-580 x BML 7	51	2	99	210	83.9	8.989	8.89	10
IMH 2-24K-19	MIL 2-801-1 × MIL 2-1299-5	49	2	98	210	86.1	8.735	5.82	11
IMH 2-24K-62	MIL 2-1289-2 × BML 6	52	2	98	212	84.6	8.722	5.66	12
IMH 2-24K-20	MIL 2-814-2 × MIL 2-406	50	3	99	225	84.4	8.701	5.41	13
IMH 2-24K-72	MIL 2-1721-7-1 × BML 6	51	2	96	183	86.2	8.621	4.43	14
IMH 2-24K-41	MIL 2-3240 × LM 14	51	2	99	216	84.5	8.555	3.63	15
IMH 2-24K-22	MIL 2-975 × MIL 2-406	49	2	92	224	80.7	8.480	2.73	16
IMH 2-24K-44	MIL 2-1620 × LM 14	49	3	94	217	86.2	8.452	2.39	17
IMH 2-24K-75	MIL 2-1748-14-3 × LM 14	50	3	99	167	81.5	8.441	2.25	18
IMH 2-24K-1	LM 14 × MIL 2-1062-1-2	51	2	99	205	86.9	8.424	2.05	19
Check 5	LG 34.05	52	2	92	223	88.0	8.255		
Check-4	NK 6240	51	2	98	222	84.2	8.054		
Check-1	Bio 9544	52	2	101	194	82.3	7.486		
Check-2	Bio 9682	52	2	98	200	86.4	6.755		
Check-3	CMH 02-292	49	2	97	233	82.3	6.213		
	Mean	51.18		96.60	208.55	84.25	6.601		
	CV (%)	6.91		7.15	8.34	12.84	14.94		
	CD (5%)	2.35		4.76	14.32	0.86	0.738		

Evaluation of diallel experimental hybrids under normal environment at RMR&SPC, Begusarai during *Rabi*-2024-25.

A set of 55-diallel experimental hybrids along with five checks was evaluated under normal environment during Rabi-2024-25 at RMR&SPC, Begusarai. The six experimental hybrids out yielded the best check (CP 858) and the top-ranking hybrid IMH 2-24R-38 (MIL 2-1299-5 × MIL 2-406-1) yielded 10.409 with 6.44% yield superiority over best check. The trial was laid very late due to which expression of the trial was low (Table 1.5).

Table 1.5: Performance of medium maturity diallel experimental maize hybrids under normal environment during Rabi-2024-25 at RMR&SPC, Begusarai

Entry name	Pedigree	Ears/ plant	Maturity (d)	Pl. height (cm)	100 KW	Sh%	Grain Yield (t/ha)	% Sup	Rank
IMH 2-24R-38	MIL 2-1299-5 × MIL 2-406-1	1.20	154	161	31.5	82.4	10.409	6.44	1
IMH 2-24R-31	MIL 2-2034 × BML-6	1.39	153	158	38.0	82.8	10.317	5.50	2
IMH 2-24R-17	MIL 2-1289 × MIL 2-571	1.19	153	188	33.5	79.1	10.238	4.69	3
IMH 2-24R-55	MIL 2-2044 × LM13	1.18	155	197	36.5	80.0	10.205	4.36	4
IMH 2-24R-47	MIL 2-1062-1-2 × MIL 2-310-1	1.37	152	192	33.0	82.7	10.041	2.67	5
IMH 2-24R-23	MIL 2-114-2 × MIL 2-1062-1-2	1.61	151	169	29.5	85.8	9.971	1.96	6
Check-2	CP-858	1.43	159	183	34.0	81.9	9.779		
Check-5	NK-6240	1.38	157	181	35.0	78.8	8.782		
Check-4	CMH-08-287	1.20	155	153	33.5	78.4	7.460		
Check-1	Bio-9544	1.00	155	177	36.0	83.7	5.381		
Check-3	DHM-117	1.00	150	172	30.0	66.5	5.261		
	Mean	3.91	156.73	167.75	33.42	79.00	6.708		
	CV	18.30	7.28	8.74	12.34	14.28	14.69		
	CD	0.04	7.38	10.29	2.94	6.79	0.782		

Grain purpose hybrids using CMS system

Three high yielding grain hybrids using CGMS system namely, IMH 11-252, IMH 11-253 and IMH 11-254 were contributed to NIVT trial kharif 2025. Further, during *Kharif* 2025, a total of 75 maize hybrids developed using different CMS lines were evaluated along with two checks, NK 6540 and NK 6240. The experiment was laid out in an alpha lattice design with two replications, each having two rows per entry, at a spacing of 60 × 20 cm. The design helped in minimizing experimental error while evaluating a large number of hybrids. The analysis of variance (ANOVA) revealed that the treatment effect was highly significant ($P < 0.001$) for grain yield, indicating the presence of sufficient variability among the hybrids. The effects due to replications and blocks within replications were non-significant, showing that the experimental field was fairly uniform and the layout was appropriate.

Table 1.6: ANOVA of 75 hybrids for grain yield

S.V.	df	SS	MS	F	P
Replication	1	70	70.02	0.5322	0.46
Treatment (Unadj.)	74	46063	622.47	4.73	0.000***
Block:Replication	28	3979	142.11	1.08	0.39
Residual	46	6052	131.57		

Based on mean grain yield performance, five hybrids were identified as superior over the checks. The hybrid IMH II-K2402 recorded the highest yield (9.32 t ha^{-1}) and showed 13.80% superiority over NK 6240 and 46.10% over NK 6540. This was followed by IMH II-K2403, which produced 8.97 t ha^{-1}, with a yield advantage of 9.41% over NK 6240 and 41.09% over NK 6540. The hybrids IMH II-K2404, IMH II-K2404 (second entry), and IMH II-K2401 recorded yields of 8.61, 8.18, and 8.04 t ha^{-1}, respectively, and showed consistent superiority over NK 6540, with yield advantage ranging from 26.60% to 28.96%. Although these hybrids were comparable with NK 6240, their higher yield over NK 6540 indicates good yield potential under the tested conditions.

Table 1.7: Top five hybrids for grain purposes

S. No.	Ex. hybrids	Yield (t/ha)	% superiority NK 6240	% superiority NK 6540
1.	IMH 11-K2402	9.32	13.80	46.10
2.	IMH 11-K2403	8.97	9.41	41.09
3.	IMH 11-K2404	8.61	-	28.01
4.	IMH 11-K2404	8.18	-	28.96
5.	IMH 11-K2401	8.04	-	26.60
Check	NK 6240	8.19		
Check	NK 6540	6.35		

CV- 20.66, CD- 2.3 at 5%

Evaluation of white maize hybrids

Two hundred crosses were evaluated during spring 2025 at Ludhiana in α-lattice design with two replications. The hybrids were generated using line x tester method using four testers namely LM 13-white, HKI 163-white, UMI1201-White, UMI1200-white with 70 lines. The hybrids were tested in a three-meter row length. Total eight hybrids recorded >10% yield superiority over the best check (Bio 9544). The results are presented in the Table 1.8.

Table 1.8: Performance of white hybrids evaluated during spring 2025

Sl. No.	Cross	DTA	Mean Yield (Kg/ha)	Superiority
1	UMI1200-white × 28192	86	10978.94	23.41
2	UMI1201-white × 28201	86	10078.76	13.29
3	UMI1200-white × 28169	81	10061.48	13.09
4	UMI1200-white × 28153	80	9951.502	11.86
5	UMI1201-white × 28155	84	9851.569	10.73
6	UMI1201-white × 28173	82	9844.638	10.66
7	UMI1200-white × 28178	84	9841.182	10.62
8	UMI1200-white × 28141	84	9819.53	10.37
	Bio 9544 (Best Check)	53	8896.56	
	CD (t5%)		1067.64	
	CV (5%)		13.25	

Figure 1.3: White hybrids showing >10% superiority over the checks

Further two sets of white hybrids were evaluated during kharif 2024. First set consists of 130 crosses. The hybrids were generated using line x tester method using four testers namely HKI1344, HKI1378, GM328C1, GM9C1, GM95C5, GPM696, LM 13-W, LM16-W with 26 lines. The hybrids were tested in a three-meter row length. Total three hybrids recorded >10% yield superiority over the best check (LG3405). The results are presented in the Table 1.9(a).

Table 1.9 (a): Performance of white hybrids evaluated during kharif 2024 (set-I)

Sr. No.	Cross	DTA	Mean Yield (Kg/ha)	Superiority
1	26119 × LM 13-W	50	8746.28	14.47
2	26123 × LM16-W	50	8522.22	11.55
3	26097 × LM 13-W	53	8478.97	10.98
4	26127 × GM95C5	52	8402.40	9.98
	LG3405 (Best Check)	53	7640.06	
	CD (5%)		621.58	
	CV (5%)		14.26	

Figure 1.4: White hybrids showing >10% superiority over the checks

Second set consisted of 186 crosses. The hybrids were generated using line x tester method using four testers namely HKI1344, HKI1378, HKI 1352, GM328C1, GM9C1, GM95C5, GPM696 with 40 lines. The hybrids were tested in a three-meter row length. Total six hybrids recorded >10% yield superiority over the best check (LG3405). The results are presented in the Table 1.9 (b).

Table 1.9 (b): Performance of white hybrids evaluated during kharif 2024 (set-II)

Sl. No.	Cross	DTA	Mean Yield (Kg/ha)	Superiority
1	GM 9C1 × 26738	53	9066.98	13.86
2	GM 9C1 × 26668	54	8896.16	11.73
3	GM 9C1 × 26788	50	8864.17	11.33
4	GPM 696 × 26668	50	8896.95	11.74
5	GM 9C1 × 26748	52	8804.41	10.58
6	GM 9C1 × 26776	55	8809.56	10.64
	LG3405 (Best Check)	53	7962.36	
	CD (5%)		779.34	
	CV (5%)		15.97	

Screening maize germplasm and breeding for abiotic stress

Screening of maize genotypes against salinity stress at IIWBR Regional station

A set of 100 maize genotypes were evaluated under salinity stress in alpha lattice design with two replications during spring 2025. Out of 110 genotypes, 8 were not germinated. Salinity level of the field plot ranged 4.29 to 7.64 ds/m. Genotypes IMH 223, III363 and 111391 shown good performance and grain yield under both replications (Table 1.10). In some of the entries very poor seed set was observed due to severe heat stress.

Table 1.10: Best performing genotypes under salinity stress.

Rep	Treatment	Block	Ec dS/m	Rep	Trt	Block	Ec dS/m
1	111366	2	6.53	2	E-156-2-2	2	5.27
1	IBH 11-23	3	6.53	2	IBCH 402	2	5.27
1	MIL 164-1	3	6.53	2	111391	2	5.27
1	111370	4	6.46	2	79 Sikkim	3	6.72
1	111485	6	6.46	2	IQMH 207	6	5.02
1	IMH 223	7	6.49	2	111400	8	5.87
1	IQMH 207	8	6.49	2	IMH 223	9	4.92
1	111363	8	6.49	2	DMRH 1308	10	5.84
1	111391	11	5.66	2	111363	11	4.57
				2	MIL 2-274-2	11	5.45

Evaluation of IIMR field corn hybrids under waterlogging stress at Ludhiana during *Kharif*-2024

A set of IIMR recently releases nine field corn hybrids along with three checks were evaluated under waterlogging stress during kharif-2024 at IIMR, Ludhiana. Five hybrids IMH 225, IMH 222, IMH 231, IMH 230 IMH 228 out yielded the best check hybrid Bio 9544. The top-ranking hybrid IMH 225 out yielded over best check with grain yield of 6.714 t/ha and superiority of 29.86% (Table 1.11).

Table 1.11: Performance of IIMR field corn hybrids under waterlogging stress at Ludhiana during Kharif-2024

Name of hybrid	Survival %	Ears/ plant	Anthesis(d)	ASI	Maturity (d)	Plant height (cm)	100/KW (g)	Sh%	GY (t/ha)	Rank
IMH 225	87.8	0.86	50	3.5	95	193	32.1	81.6	6.714	1
IMH 222	87.5	0.86	49	4.5	94	190	33.2	80.2	6.348	2
IMH 231	81.6	0.90	50	3.5	91	178	34.9	81.8	5.679	3
IMH 230	81.6	0.88	49	4.5	96	211	33.6	82.6	5.589	4
IMH 228	71.4	0.94	50	4.9	94	192	32.2	79.4	5.357	5
Bio 9544 (C1)	79.6	0.92	49	4.6	95	173	31.3	82.6	5.170	6
IMH 224	81.3	0.85	49	4.0	92	183	33.1	78.9	5.125	7
IMH 226	79.6	0.87	48	4.6	93	166	32.7	77.4	4.937	8
IMH 227	77.6	0.79	49	5.4	93	194	33.8	79.2	4.625	9
IMH 223	63.3	0.90	51	4.3	93	173	32.9	75.2	4.489	10
Bio 9682 (C2)	72.9	0.86	48	5.3	94	171	30.7	80.2	4.429	11
CMH 02-292 (C3)	77.6	0.84	48	5.0	92	238	30.5	76.4	4.357	12
Mean	78.5	0.87	49	4.5	93.4	188	32.6	79.6	5.235	
CV (%)	21.20	17.40	8.40	13.40	8.70	10.60	14.60	14.20	19.80	
CD	6.82	0.11	4.32	0.46	6.48	12.42	3.12	5.42	0.872	

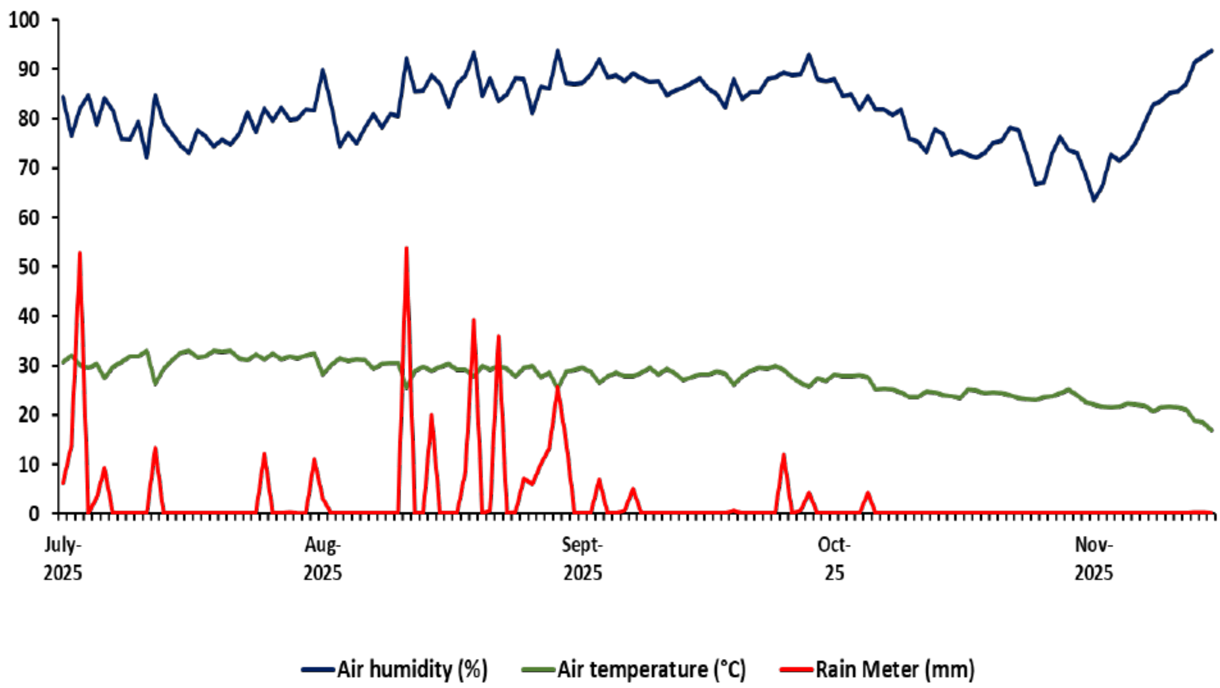


Figure 1.5: Meteorological data of Kharif- 2024 at Ladowal, Ludhiana

Screening of maize germplasm and breeding for biotic

Screening of maize germplasm against Fall army-worm and Pink stem Borer insects during Rabi 2024-25.

A set of 61 maize inbred lines along with two checks were screened against Fall armyworm and pink stem borer insects. Two inbred lines MIL2-100 and MIL 2-325-1shown promising resistance against FAW with LDR score <3.0. Similarly, two inbred lines MIL 2-154-1 and MIL 678-1 also shown resistance against pink stem borer with LIR scale <3.0.

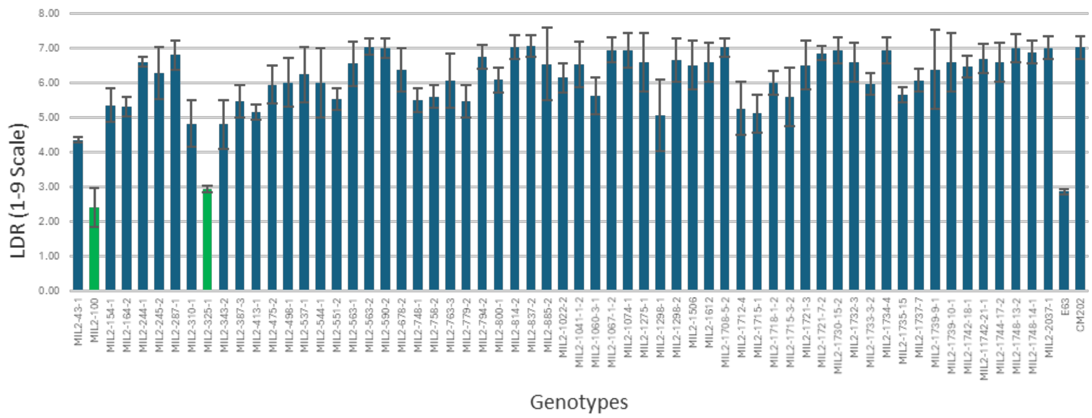


Figure 1.6: LDR rating of maize inbreds against FAW

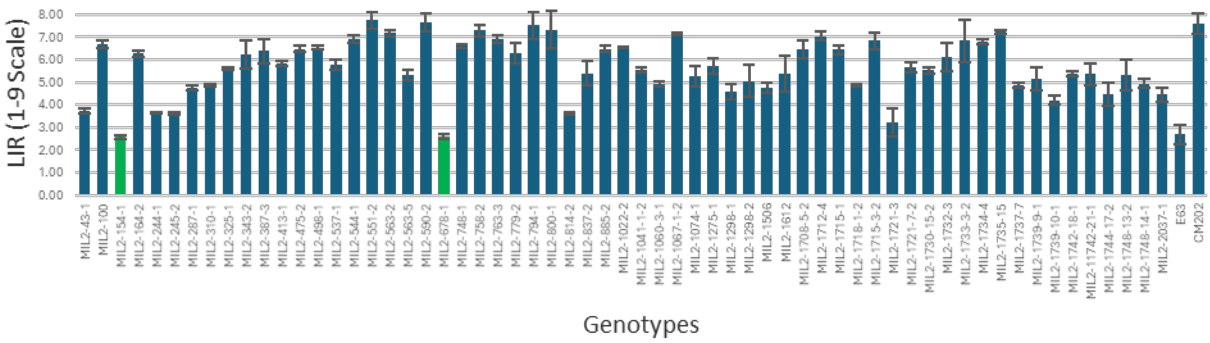


Figure 1.7: LIR rating of maize inbreds against pink stem borer

Genetic inheritance and gene action of Turcicum Leaf Blight (TLB) resistance in maize (Zea mays L.)

Six inbred maize lines comprising resistant (TLB-1106, TLB-1101, TLB-1103) and susceptible (TLB-143, TLB-115, TLB-113) parents were crossed in a half-diallel fashion to generate nine resistant × susceptible (R × S) crosses. Six generations (P_1, P_2, F_1, F_2, BC_1 and BC_2) were developed for each cross. The material was evaluated under artificial epiphytotic conditions at two locations, ZARS, Mandya and MARS, Dharwad, during *kharif* 2024. Artificial inoculation was carried out twice using sorghum grain culture to ensure uniform disease pressure. Disease severity was recorded using a 1-9 scale at 60 DAS and again at peak disease expression (85-90 DAS). The data were subjected to location-wise and pooled ANOVA, generation mean analysis, scaling tests, joint scaling analysis, and Bayesian MCMC-based gene number estimation. Location-wise ANOVA revealed highly significant differences among generations across all nine crosses at both locations, indicating substantial genetic variability for TLB resistance. Pooled ANOVA showed significant effects of generations, locations, and generation × location interaction, confirming both genetic control and environmental influence on disease expression. Generation mean analysis detected significant additive and dominance effects across most crosses, suggesting the involvement of major genes in resistance expression. Scaling tests frequently rejected the additive-dominance model, indicating the presence of non-allelic interactions, with duplicate epistasis predominating across crosses and environments. Joint scaling analysis further confirmed the inadequacy of simple genetic models and highlighted the importance of epistatic gene action in governing resistance. Classical joint scaling-based gene number estimates yielded uniformly low values across crosses and locations, primarily because these estimates are sensitive to non-additive genetic interactions, which reduce the observable segregational variance and limit resolution of individual loci. Bayesian MCMC-based estimation, which explicitly accommodates uncertainty and complex variance structures, was able to better capture the underlying genetic architecture and indicated that TLB resistance is governed by a limited number of effective genes, generally in the low to moderate range. The close agreement of Bayesian gene-number estimates across locations further suggested that the genetic control of TLB resistance is relatively stable across environments.

The present study has established that TLB resistance in maize is under genetic control involving a limited number of interacting genes with significant non-additive effects. These findings provide a strong foundation for the identification of resistance-associated genomic regions. Future work will utilize the already developed $F_{2:3}$ mapping population from R × S for QTL analysis using molecular marker-based approaches to identify genomic regions governing TLB resistance.

Use of wild species of maize for improving fodder and silage maize

Maize Wild Block: A Maize Wild Relative Block has been developed in Field No. 11 at IIMR, Ladhowal covering an area of 1400 m² (0.35 acre). The block is provided with proper iron pole barbed wire fencing to ensure effective protection of wild maize species. This dedicated block has been specifically established for the maintenance and conservation of maize wild relatives.

At present, we are haing wild species of maize, including *Zea mays* ssp. *mexicana* (12 accessions), *Zea mays* ssp. *parviglumis* (3 accessions), *Zea mays* ssp. *diploperennis* (1 accession), *Zea mays* ssp. *luxurians* (1 accession), and *Zea mays* ssp. *nicaraguensis* (1 accession). Proper fencing and field management practices are being followed to maintain genetic purity and to facilitate their effective utilization in future breeding and pre-breeding programmes.

Wild Crosses: During the kharif season, wild F_1 crosses were planted for further backcrossing and selfing. A total of 46 F_1s involving *Zea mays* ssp. *mexicana*, 41 F_1s involving *Zea mays* ssp. *parviglumis*, and 7 COEX crosses were established in the field. In addition, eight crosses of *Zea diploperennis* and one cross of *Zea nicaraguensis* were successfully made and planted for advancement. These materials are being maintained for introgression of useful traits from wild relatives into cultivated maize through systematic backcrossing and selfing.

A total of 168 doubled haploid (DH) lines were generated from wild-derived backgrounds UMI 1201_BC1F1_2GenRM and UMI 1210_BC1F1_2GenRM using Zea mays ssp. parviglumis as the donor parent. These wild-generated inbred lines were grown for the first time at Begusarai during Rabi 2024–25. The material is being evaluated for initial field performance and adaptation and will be further utilized for selection and advancement in the pre-breeding and introgression programme.

Maize Fodder: Out of the seven population/composites contributed to the AICRP on Forage Crops during *Kharif* 2024, two entries (IFH 11-241 and IFH 11-246) were promoted from IVT to AVT-I based on their consistent performance. In the North East Zone, IFH 11-246 recorded a green fodder yield of 384.10 q ha^{-1}, showing a 6.3% superiority over the check varieties J1006 (313.00 q ha^{-1}) and African tall (340.20 q ha^{-1}). Similarly, in the South Zone, IFH 11-241 produced a green fodder yield of 547.00 q ha^{-1} and registered a 3.3% superiority over the checks J1006 (452.65 q ha^{-1}) and African tall (530.10 q ha^{-1}). In addition, three populations/composites, namely IFH 11-248, IFH 11-249 and IFH 11-250, were contributed to the AICRP on Forage Crops during *Kharif* 2025 for further evaluation.

Table 1.12: Fodder entries promoted in AICRP forage crops

Zone	Entries	Yield (q/ha)	J1006	A. tall	Superiority
North East Zone	IFH 11-246	384.10	313.00	340.20	6.3%
South Zone	IFH 11-241	547.00	452.65	530.10	3.3%

Evaluation Trials for Silage Maize (2024)

During the year 2024, evaluation trials were undertaken to assess the performance of diverse maize hybrids for silage yield and quality traits under different seasonal conditions. The objective was to identify high-performing hybrids suitable for silage production with emphasis on biomass yield and nutritional quality.

Spring Season 2024: In the spring season of 2024, 34 maize genotypes were evaluated using a Randomized Block Design (RBD). Each genotype was planted in plots consisting of five rows of 3 m length, maintaining a spacing of 60 × 20 cm. Observations were recorded on biomass yield and related traits and silage quality parameters, namely dry matter (DM), crude protein (CP), ether extract (EE), neutral detergent fibre (NDF), acid detergent fibre (ADF), and acid detergent lignin (ADL). The results indicated significant variability among the genotypes for both yield and quality traits. Among the entries evaluated, the hybrids IMH 222, IMHSB-20R-6, LG 32.05, and IQMH 203 exhibited superior performance, recording higher green fodder yield along with favourable silage quality parameters.

Table 1.13: Best performing hybrids for silage purposes for biomass yield and quality traits in spring 2024

Genotype	DM %	Yield (q/ha)	CP	EE	NDF	ADF	ADL	Ash
IMH 222	34.3^{lmn}	435.33	7.80^{abcd}	3.03^{abcd}	61.5^{abc}	31.9	4.33	6.68^{bcd}
IMHSB -20R-6	32.9^{jklm}	360.7	7.64^{abc}	3.65^{abcde}	59.6^{a}	28.8^{ab}	3.55	6.31^{abcd}
LG 32.05	33.4^{jklm}	342.04	8.40^{cd}	3.15^{abcd}	62.6^{abc}	30.2^{ab}	3.85	4.83^{a}
IQMH 203	32.7^{ijkl}	317.79	7.20^{ab}	4.80^{e}	64.1^{abc}	30.2^{ab}	3.18	5.83^{abcd}
FAUJI 313	35.3^{n}	296.39	8.02^{bcd}	3.30^{abcd}	60.7^{ab}	29.2^{ab}	3.13	5.57^{abc}
DKC 9108	34.7^{mn}	291.66	8.38^{cd}	4.18^{de}	59.5^{a}	27.5^{a}	4.13	5.11^{ab}
15407	33.5^{jklm}	261.19	7.90^{bcd}	3.90^{cde}	61.7^{abc}	32.1	3.53	6.64^{bcd}
IQMH 202	34.7^{mn}	246.89	8.23^{bcd}	3.30^{abcd}	62.5^{abc}	30.9	3.25	6.13^{abcd}
15406	35.8^{n}	210.2	7.88^{abcd}	3.38^{abcd}	63.5^{abc}	30.1^{ab}	5.1	6.04^{abcd}
IMH 226	34.2^{klmn}	204.6	8.32^{bcd}	3.50^{abcde}	60.8^{ab}	30.8	5.43	5.85^{abcd}

***Kharif* Season 2024:** During the *kharif* season of 2024, a larger set of 150 maize genotypes was evaluated using an alpha lattice design to improve experimental precision. Each entry was grown in two-row plots of 3 m length with a spacing of 60 × 20 cm. Data were recorded on the same set of yield and quality traits, including DM, CP, EE, NDF, ADF, and ADL. The hybrids namely IMH 225 and IQMH 207 consistently outperformed other entries, exhibiting higher biomass yield coupled with desirable silage quality traits.

Table 1.14: Best performing hybrids for silage purposes for biomass yield and quality traits in Kharif 2024

GENOTYPE	DM	YIELD (q/ha)	CP	FAT	NDF	ADF	ADL	ASH
SMH 4255	36.0^{m}	353.86	8.55^{ijklmn}	3.0^{bcdef}	59.4^{bcdefg}	27.80^{cdef}	3.25^{abcdef}	$5.50^{hijklmno}$
IMH 225	34.9^{lm}	304.23	8.25^{hijkl}	2.6^{abcd}	54.6^{ab}	21.27^{ab}	3.10^{abcde}	6.85^{o}
P 3255	33.5^{klm}	346.27	8.90^{mno}	3.8^{fghi}	$66.2^{jklmnop}$	28.70^{cdefg}	3.05^{abcde}	$4.45^{bcdefghi}$
BMH 0165	32.8^{jklm}	369.03	8.50^{ijklmn}	4.0^{ghi}	66.9^{klmnop}	32.87^{efghi}	4.05^{efghij}	5.80^{lmno}
BIO 9766	32.6^{ijklm}	395.52	8.91^{mno}	3.7^{efgh}	$64.7^{ghijklmnop}$	33.37^{efghi}	$3.50^{abcdefg}$	3.19^{a}
TMMH 8842	32.2^{hijklm}	314.55	8.30^{ijkl}	4.3^{hijk}	$59.1^{abcdefg}$	27.17^{cde}	2.50^{a}	$4.33^{abcdefgh}$
ADV 765	$31.8^{ghijklm}$	377.36	8.25^{hijkl}	3.0^{bcdef}	67.3^{lmnop}	28.37^{cdefg}	4.25^{fghij}	$4.50^{bcdefghij}$
IQMH 207	$31.6^{fghijklm}$	359.2	8.25^{hijkl}	2.3^{ab}	68.8^{nop}	35.10^{ghi}	4.85^{ij}	$5.25^{fghijklmno}$
TMMH 2852	$31.5^{efghijklm}$	322.39	7.70^{fgh}	2.6^{abcd}	$62.1^{defghijklm}$	32.40^{efghi}	3.90^{defghi}	4.20^{abcdef}
NK 7704	$31.4^{efghijklm}$	307.96	8.75^{lmn}	3.4^{defg}	$61.3^{cdefghijk}$	34.27^{fghi}	4.80^{ij}	$5.13^{efghijklmno}$

Sweet corn

One sweet corn hybrid ISCH 602 [ISH 6-2104] of medium duration has been identified for release for commercial cultivation in the peninsular zone (PZ), and central western zone (CWZ). The average ear yield without husk of ISCH 602 [ISH 6-2104] is 11825 kg/ha in peninsular zone (PZ), and 9182 kg/ha in central western zone (CWZ) which is 3.9% superior over the bet check Mishti in PZ (11383 kg/ha) and 10.6% superior over best check CMVL Sweet Corn-1 (8298 kg/ha) in CWZ. In addition, three entries, namely ISH 6-2101 (10852 kg/ha), ISH 6-2105 (11054 kg/ha), and ISH 6-2113 (11492 kg/ha) were promoted in NWPZ based on superiority over the best check ASKH 1 in NWPZ (10539 kg/ha).

Popcorn

The germplasm development of popcorn meeting international quality standards like 95-100 per cent popping percentage and >30 expansion ratio are being developed. Based on the preliminary data, around 10-15 popcorn inbred lines with >30 expansion ratio with near 100 per cent popping percentage are under advanced stage of inbred lines development.

Germplasm development

Two mapping populations of 393 and 399 $F_{2:3}$ families have been developed for identification of genomic regions determining resistance to turcicum leaf blight (TLB). In addition, seven sets of six generations (P_1, P_2, F_1, F_2, BC_1P_1, and BC_1P_2) have been developed to understand the genetics of TLB resistance in maize.

QTL mapping

QTL mapping for BLSB has identified one QTL on chromosome 6, qBLSB-6 which explained >12% phenotypic variability with LOD value of >9.0. The generation mean analysis of BLSB has showed the presence of duplicate or duplicate dominant interaction with two genes governing the BLSB resistance

Breeding for quality traits

Development of high-starch maize hybrids and process optimization for better ethanol recovery

A comprehensive screening of commercially available maize hybrids (200) from both public and private sectors was undertaken through multi-location trials to assess extractable starch content. The evaluated hybrids exhibited extractable starch content ranging from 55-65%, with several recording more than 62%. Promising hybrids such as IMH 25-15, IMH 227, IMH 229, DMRH 1301, and IQPMH 2403 demonstrated superior performance. Notably, hybrid IMH 229 has already entered the DAC seed chain, with two companies signing agreements in 2025 for its commercial seed production and marketing.

To strengthen the waxy maize germplasm base, waxy corn germplasm imported from CIMMYT, Mexico, has been received and is currently under post-quarantine evaluation. Additionally, high-starch germplasm (~70%) imported from the USA is being effectively utilized in the breeding programme to enhance starch content in normal maize. A robust breeding pipeline has been established, leading to the development of approximately 2,000 experimental hybrids currently under systematic evaluation for high grain yield and improved starch content. From this pool, 12 elite hybrids have been identified, combining high grain yield (≈10 t ha^{-1} in *Kharif* and >12 t ha^{-1} in Rabi) with high extractable starch content (>64%).

Efforts were also directed toward improving DDGS quality through aflatoxin management. Aflatoxins and other mycotoxins produced by Aspergillus species severely compromise maize grain quality, particularly under poor post-harvest drying, improper storage, or field infections. During distillery processing, these toxins do not degrade significantly; instead, they become three- to four-fold concentrated in distillers' dried grains with soluble (DDGS) due to starch removal and retention of non-fermentable components. Contaminated DDGS exhibits reduced nutritional value, impaired protein digestibility, and poses significant health risks to livestock. Based on systematic evaluation of management options, a fungistatic *"mycotoxin suppressor"* treatment was finalized, providing effective protection to stored grains and ensuring improved DDGS quality.

Process optimization studies focused on improving ethanol recovery during fermentation. During bioethanol production, *Saccharomyces cerevisiae* diverts 4–10% of sugar substrate toward glycerol synthesis to regenerate NAD^+ under osmotic and redox stress, thereby reducing ethanol yield and increasing downstream processing costs. To address this, indigenous improved yeast strains were developed through directed evolution. Two evolved strains, designated 4-1 and 10-3, demonstrated consistent growth under high ethanol concentrations and antibacterial-containing media, which is essential for preventing contamination in commercial maize mash fermentations. These strains achieved 1.0-1.5% higher ethanol yield compared to the parent strain and are currently being evaluated for transcriptomic and genome-level changes resulting from directed evolution.

Furthermore, yeast immobilization ("encasing") strategies are being explored to facilitate reuse and prevent yeast carryover into DDGS. This approach aims to enhance fermentation efficiency while ensuring that modified yeast does not remain in the by-product stream, thereby improving industrial applicability, biosafety, and overall product quality.

Meta-QTL analysis for climate-resilient high starch maize to enhance bioethanol production

Maize is a major feedstock for bioethanol production due to its high kernel starch content, the primary substrate for fermentation. However, climate-induced stresses such as drought and waterlogging reduce grain yield, starch accumulation, and ethanol productivity. Enhancing starch content along with stress tolerance is therefore crucial for stable bioethanol production under changing climates.

This study aimed to identify stable genomic regions and candidate genes associated with starch content and tolerance to drought and waterlogging in maize. A meta-QTL (MQTL) analysis integrating 254 QTLs from 21 independent studies was conducted. Of these, 184 QTLs were projected onto a consensus map, resulting in 21 stable MQTLs: 12 for starch content, five for waterlogging tolerance, and four for drought tolerance (Table 1.15). Mapping precision improved substantially, reducing the average confidence interval from 23.3 cM to 6.2 cM (73.4% reduction).

Table 1.15. List of meta-QTLs identified for drought, waterlogging and starch content in maize (Kumar et al., 2025)

Sl. No	MQTLs	Chr	No. of QTLs	Position (cM)	CI (cM)	PVE %	Flanking Markers
1	MQTLST1.1	1	3	11.9	5.4	8.0	IDP6077-Lim51
2	MQTLST1.2	1	2	63.4	3.6	28.5	IDP4925-magi39284
3	MQTLST1.3	1	4	193.1	6.8	5.0	umc1955-mate10
4	MQTLST2.1	2	3	175.2	4.3	3.0	bnl17.14-ufg55
5	MQTLST3.1	3	2	85.5	5.4	12.0	TIDP5096-Pin14
6	MQTLST3.2	3	2	114.1	2.3	5.0	gpm823-TIDP3751
7	MQTLST4.1	4	2	39.8	4.4	8.5	IDP7593-umc1329
8	MQTLST4.2	4	2	68.7	13.3	7.5	Pco109372-bnlg1189
9	MQTLST5.1	5	2	33.9	2.1	8.5	bnlg237-gpm732b
10	MQTLST5.2	5	2	40.4	10.9	9.5	IDP8686-gpm732b
11	MQTLST5.3	5	3	165.0	8.6	30.0	magi77095-IDP9100
12	MQTLST6.1	6	2	114.4	8.8	5.0	IDP7726-Wak137
13	MQTLWL3.1	3	2	52.2	14.0	5.0	gpm854-Iaa8

14	MQTLWL3.2	3	2	108.7	1.6	9.0	IDP8416-umc1449
15	MQTLWL3.3	3	3	115.2	0.7	6.0	umc1729-IDP58
16	MQTLWL4.1	4	2	75.8	1.4	5.0	bnlg2162-wri2
17	MQTLWL5.1	5	2	127.0	7.0	7.5	IDP6017-aasr6
18	MQTLDT1.1	1	2	14.3	1.3	6.0	IDP2420-IDP658
19	MQTLDT1.2	1	3	161.5	7.2	11.0	umc1812-umc2287
20	MQTLDT4.1	4	3	125.6	12.1	6.5	TIDP6178 -IDP8476
21	MQTLDT9.1	9	2	64.7	8.7	6.5	TIDP5595-umc114

Notes: MQTLST-Meta-QTL for starch content, MQTLWL-Meta-QTL for waterlogging tolerance, MQTLDT-Meta-QTL for drought tolerance.

Four MQTL hotspot regions on chromosomes 1, 3, 4, and 5 were identified as key genomic regions influencing both starch accumulation and abiotic stress tolerance. Within these regions, 680 candidate genes were detected, including those related to starch biosynthesis and stress-responsive transcription factors such as NAC, WRKY, MYB, MADS-box, and AP2/ERF. Functional annotation, pathway enrichment, and in silico expression analyses supported their roles in metabolic and stress-response pathways.

Overall, the identified MQTLs and candidate genes provide precise genomic targets for marker-assisted breeding, genomic selection, and genetic engineering to develop climate-resilient, high-starch maize cultivars for sustainable bioethanol production.

Breeding for high zinc and quality protein maize

Significant progress has been achieved toward enhancing zinc (Zn), iron (Fe), and protein quality traits in maize through integrated genomics, breeding, and genome-editing approaches. Transcriptome profiling of maize line CML 451Q under high Zn, Fe, Zn+Fe, and control conditions previously identified 6,249 differentially expressed genes (DEGs) in kernels and 5,766 DEGs in shoots. Building upon these findings, key candidate genes associated with high zinc accumulation—*Zm00001eb138620,Zm00001eb281980, Zm00001eb198340, Zm00001eb025850,Zm00001eb025950*, and *Zm00001eb182310* were validated using qRT-PCR, strengthening their functional relevance in zinc biofortification.

To further dissect the genetic architecture of nutritional traits, a comprehensive Meta-QTL (MQTL) analysis was conducted using 308 QTLs compiled from 29 published studies. Sixteen stable MQTLs were identified across eight maize chromosomes (excluding chromosomes 4 and 6) for grain zinc (GZn), grain iron (GFe), protein content (PC), and protein quality (PQ) (Fig. 1.8; Table 1.16)**.** These MQTLs explained phenotypic variation ranging from 7.3% to 41% and reduced confidence intervals by 4.86-fold, significantly improving mapping precision. Six MAS-friendly and five hotspot MQTLs were identified, along with 591 candidate genes within MQTL regions. Fourteen of these genes are functionally associated with grain filling, metal ion homeostasis, fatty acid biosynthesis, and protein metabolism, providing valuable genomic resources for marker-assisted breeding and biofortification.

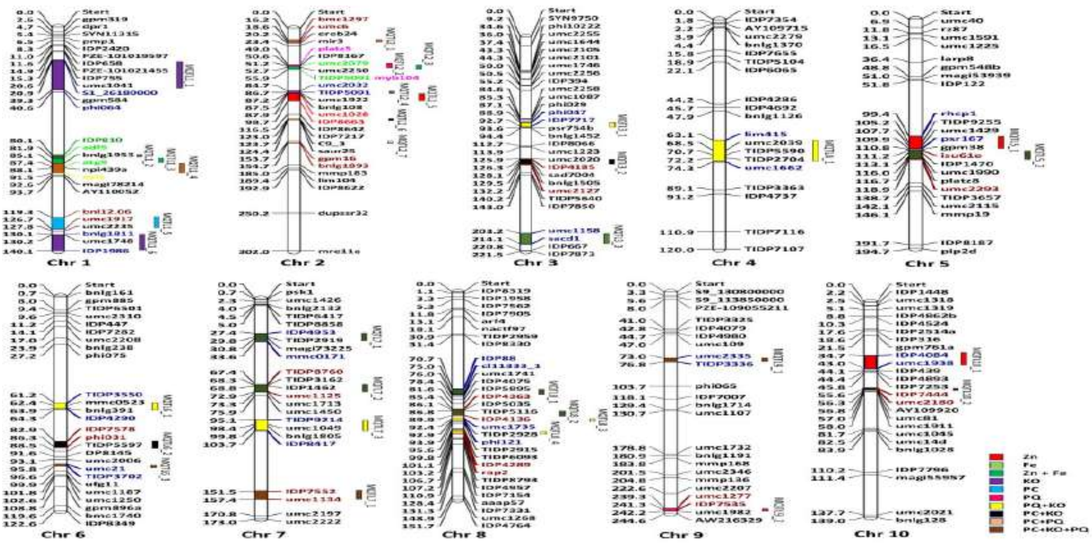


Figure 1.8: Graphical representation of 16 MQTLs distributed on eight chromosomes of maize for polygenic nutritional traits such as Fe, Zn, Protein content and quality.

Table 1.16. List of meta-QTLs identified for grain iron, grain zinc, protein content, and protein quality.

Trait	MQTLs	Chr. No.	Position (cM)	R^2 (PVE %)	Flanking Markers
GZn	MQTL2_5	2	88.3	33.3	umc1028 - IDP8663
GZn	MQTL5_1	5	106.2	8.6	rhcp1 - psr167
GZn	MQTL10_1	10	36.3	25.1	IDP4084 - umc1938
GFe	MQTL1_3	1	79.9	29.4	adf5 - atg9
GFe	MQTL2_3	2	58.4	19.0	umc2079- TIDP5091
GZn, GFe	MQTL1_2	1	74.2	7.3	IDP810 - adf5
GZn, GFe	MQTL3_3	3	208.9	13.5	umc1158 - sacd1
GZn, GFe	MQTL5_2	5	114.9	31.0	isu61e - umc2293
GZn, GFe	MQTL7_1	7	29.7	6.3	IDP4953 - mmc0171
GZn, GFe	MQTL7_2	7	71.6	24.7	TIDP8760 - umc1450
GZn, GFe	MQTL8_1	8	73.8	41.0	IDP88 - C11133_1
GZn, GFe	MQTL8_2	8	87.4	28.0	IDP4363-IDP4136
PC	MQTL1_5	1	123.5	12.5	bnl12.06-umc1917
PQ	MQTL2_2	2	52.6	23.3	platz5-myb104
PQ	MQTL9.2	9	240.2	12.5	umc1277 - IDP7535
PC, PQ	MQTL2_6	2	119.3	16.8	IDP8642-IDP7217

GZn: grain zinc, GFe: grain zinc, PC: protein content, and PQ: protein quality, Chr: chromosome

In parallel, genome editing approaches were initiated to enhance Fe and Zn accumulation. The *HRZ* (Hemerythrin E3 ligase) gene, a key regulator of metal homeostasis validated in rice and Arabidopsis, was targeted using CRISPR–Cas9 technology. Maize *HRZ* orthologues were isolated from the elite hybrid DMRH 1308, and a highly efficient, low off-target guide RNA was designed using CRISPR Direct and CHOP-CHOP tools, with structural validation via RNAfold. The optimized gRNA was cloned into the pRGEB32-BAR vector containing the spCas9 system and mobilized into *Agrobacterium tumefaciens*. More than 500 nodal explant–derived calli were transformed, and regenerated events are currently progressing through selection and regeneration stages, representing a major step toward precise biofortification through genome editing.

Considerable progress has also been made in developing nutritionally enriched maize hybrids. Two hybrids, IQH 7-219 (Lys+Trp+Zn) and IQH 7-225 (Lys+Trp), successfully completed three years of multilocation AICRP testing in 2025 and will be proposed for identification. IQH 7-219 recorded yields up to 10.0 t/ha across Rabi and up to 8.0 t/ha in *Kharif* seasons, while IQH 7-225 yielded up to 6.5 t/ha in *Kharif*. Additionally, thirteen promising IQH-25 series hybrids enriched with Lys+Trp+Zn are under evaluation, recording yields of 7.0-8.5 t/ha in *Kharif* and 9.0-10.0 t/ha in Rabi. These hybrids demonstrate strong potential to combine high productivity with enhanced nutritional traits, contributing directly to nutritional security.

Development of Multi-Trait Quality lines: Number of lines have been developed for multiple quality traits viz., high lysine, tryptophan content along with high Pro-vitamin A and low Phytic acid. QIL 4-3564 is identified with high Protein content, tryptophan, lysine, pro-vit A and low Phytic Acid. QIL 4-3502 and QIL 4-3575 have been identified for Low Phytic Acid whereas QIL 4-3580 and QIL 4-3558 have also shown good potential for all these traits. The details of the lines is given below:

Table 1.17: Multi-Trait Quality lines with high lysine, tryptophan content along with high Pro-vitamin A and low Phytic acid

S.No.	Name of Inbred	Protein (%)	Lysine (%)	Try (%)	Pro. A (ppm)	PA (mg/g)
1	QIL4 -3502	9.19	2.03	0.46	3.08	**1.91**
2	QIL4 -3506	8.20	3.18	0.68	6.84	3.42
3	QIL4 -3511	7.87	1.95	0.37	6.30	2.93
4	QIL4 -3518	8.13	2.74	0.66	5.75	2.92
5	QIL4 -3532	10.33	2.74	0.70	7.08	3.04
6	QIL4 -3536	9.18	3.30	0.79	5.66	3.17
7	QIL4 -3538	8.14	2.79	0.65	5.34	2.88
8	QIL4 -3542	9.30	3.89	0.92	6.82	3.18
9	QIL4 -3551	9.79	2.59	0.67	3.01	2.52
10	**QIL4 -3558**	**8.30**	**2.69**	**0.74**	**7.24**	**2.62**
11	QIL4 -3562	9.57	4.93	0.70	2.96	**1.92**
12	**QIL4 -3564**	**8.78**	**3.39**	**0.83**	**8.10**	**2.06**
13	QIL4 -3567	8.20	2.79	0.64	2.26	2.51
14	QIL4 -3568	8.32	3.38	0.73	2.73	2.86
15	QIL4 -3574	8.34	4.29	0.87	5.18	3.27
16	QIL4 -3575	9.27	2.13	0.34	3.06	**1.86**
17	QIL4 -3577	9.41	3.75	0.80	3.56	2.92
18	**QIL4 -3580**	**10.03**	**3.74**	**0.75**	**6.47**	**2.53**
19	PMI-PV6	8.91	3.91	0.84	7.02	3.18
	CD	0.45	0.13	0.01	0.33	0.21
	CV	2.44	19.53	3.59	3.33	3.67

Promising line for improved protein quality

A set of 25 inbred lines was evaluated for tryptophan, lysine and methionine content. Five promising lines, namely QIL 4-2311, QIL 4-2784, QIL 4-2800, QIL 4-2825 and QIL 4-2829 have been identified for high methionine content, lysine and tryptophan content and these five lines have been submitted to ICAR-NBPGR for germplasm registration. Out of these lines one line have been registered and remaining four will be put in next meeting. The details of these lines is given below and the registered line certificate is also given below:

Table 1.20: Methionine, tryptophan and lysine content of the maize inbred lines

Sr No.	Genotype	Methionine (% of protein)	Tryptophan (% of protein)	Lysine (% of protein)
1	QIL-4-2784	2.35	0.74	3.18
2	QIL-4-2800	2.36	0.73	3.03
3	QIL-4-3080	2.39	0.92	3.68
4	QIL-4-2825	2.38	0.71	2.95
5	QIL-4-2828	1.70	0.81	3.24
6	QIL-4-2829	2.60	0.62	2.72
7	QIL-4-2830	2.44	0.66	2.69
8	QIL-4-2831	2.96	0.63	2.85
9	QIL-4-2836	1.56	0.86	3.42
10	QIL-4-2840	1.83	0.61	2.67
11	QIL-4-2841	1.62	0.74	3.02
12	QIL-4-2047	1.67	0.52	2.08

13	QIL-4-2124	1.75	0.53	2.13
14	QIL-4-2160	1.61	0.65	2.85
15	QIL-4-2169-1	1.60	0.61	2.64
16	QIL-4-2170-2	1.74	0.53	2.12
17	QIL-4-2192 (Check)	1.65	0.70	3.21
18	QIL-4-2209-1 (Check)	2.09	0.62	2.77
19	QIL-4-2234	1.71	0.63	2.66
20	QIL-4-2243	1.84	0.60	2.78
21	QIL-4-2295	2.07	0.53	2.12
22	QIL-4-2297	2.12	0.70	3.35
23	QIL-4-2300	1.80	0.69	3.06
24	QIL-4-2306	1.74	0.68	3.02
25	QIL-4-2311	2.42	0.60	2.79

Per se Performance of DH lines: New inbred lines have been developed by using DH technology and these lines were evaluated for their per se performance so that we can select the best lines for use in breeding programme. The best performing lines are given below:

Table 1.21: Per se Performance of DH lines

S. no.	Inbred Line	Grain Yield (Q/ha)
1	QIL4-3294	34.8
2	QIL4-3279	34.0
3	QIL4-3286	33.5
4	QIL4-3288	33.0
5	QIL4-3296	31.9
6	QIL4-3352	31.7
7	QIL4-3344	31.6
8	QIL4-3298	31.6
9	QIL4-3295	31.3
10	QIL4-3304	31.2
11	QIL4-3307	31.0
12	QIL4-3301	31.0
13	QIL4-3303	30.8
14	QIL4-3255	22.1
15	QIL4-3358	20.6
16	QIL4-3293	19.9
17	DQL 2192 (Check)	25.3
18	DQL 2209 (Check)	25.5
19	DMRQPM 106(Check)	31.3
	CD	2.87
	CV (%)	4.7

Evaluation of experimental QPM hybrids

One hundred and eleven experimental hybrids were evaluated during Kharif, 2025 for grain yield. Out of 111 hybrids, 15 experimental hybrids out yielded the best check Bio 9544 and 10 hybrids have recorded more 10.0 t/ha grain yield. The details of these hybrids is given below:

Table 1.22: Performance of experimental QPM hybrids

S. No.	Experimental Hybrids	Grain Yield(Q/ha)
1	QIL 4-3524 × T3	124.7
2	QIL 4-3545 × T3	113.3
3	QIL 4-3529 × T1	112.0
4	QIL 4-3524 × T1	111.6
5	QIL 4-3554 × T1	111.3
6	QIL 4-3556 × T1	111.1
7	QIL 4-3528 × T1	106.3
8	QIL 4-3529 × T3	106.0
9	QIL 4-3549 × T1	102.4
10	QIL 4-3515 × T1	101.4
11	QIL 4-3513 × T3	99.5
12	QIL 4-3555 × T1	98.5
13	QIL 4-3551 × T3	98.0
14	QIL 4-3519 × T3	98.0
15	QIL 4-3571 v T3	97.8
16	Bio-9544 (Check)	94.7
17	IQMH-206 (Check)	54.3
	CD	7.2
	CV	16.4

CHAPTER-2

BASIC SCIENCES

Developing Improved Maize Plant Types Using Genome Editing Tools:

Genome editing in maize was undertaken at ICAR–Indian Institute of Maize Research (ICAR–IIMR) to improve multiple agronomically important traits. Five CRISPR/Cas9-based genome-editing constructs were developed targeting *SBEII*, *FBL41*, *ALS*, *KRN2*, and *RAVL1*, genes known to regulate starch composition (high amylose content), resistance to banded leaf and sheath blight (BLSB), herbicide tolerance, kernel number and yield, and plant architecture, respectively. These genes are well characterized and play critical roles in key biological pathways in maize.

The coding sequences (CDS) of the target genes were amplified from the Indian maize genotypes DMRH 1308 and BML6. Target-specific guide RNAs (gRNAs) were designed toward the 5′ region of the coding sequences using CRISPR Direct and CHOPCHOP platforms, ensuring minimal predicted off-target activity. The secondary structures of the gRNAs were evaluated using the RNAfold 2.0 program to ensure structural stability and functionality.

Selected gRNAs were cloned into the pRGEB32-BAR binary vector. Correct assembly of the constructs was confirmed by colony PCR, restriction enzyme digestion, and Sanger sequencing. The validated constructs were introduced into embryogenic calli derived from nodal explants of DMRH 1308 via biolistic transformation. Transformed calli were subjected to three successive rounds of selection in darkness on callus induction medium supplemented with 2 mg L^{-1} DL-phosphinothricin (PPT/Basta). Resistant calli were subsequently transferred to regeneration medium and incubated under a 16 h light/8 h dark photoperiod, followed by transfer of regenerated shoots to rooting medium. Stable integration of the genome-editing constructs in putative transgenic plants was confirmed by PCR amplification using *bar* and *nptII* gene-specific primers (**Figure 2.1**).

To date, T_0 transformants have been generated using the *SBEII*, *FBL41*, and *KRN2* genome-editing constructs. Molecular characterization by PCR and Sanger sequencing confirmed successful vector integration in the T_0 plants; however, targeted genome editing was not detected at the T_0 stage. Generation advancement of these transgenic plants is currently underway to assess editing events in subsequent generations. In parallel, genetic transformation using the remaining constructs, as well as additional transformation experiments with these is in progress.

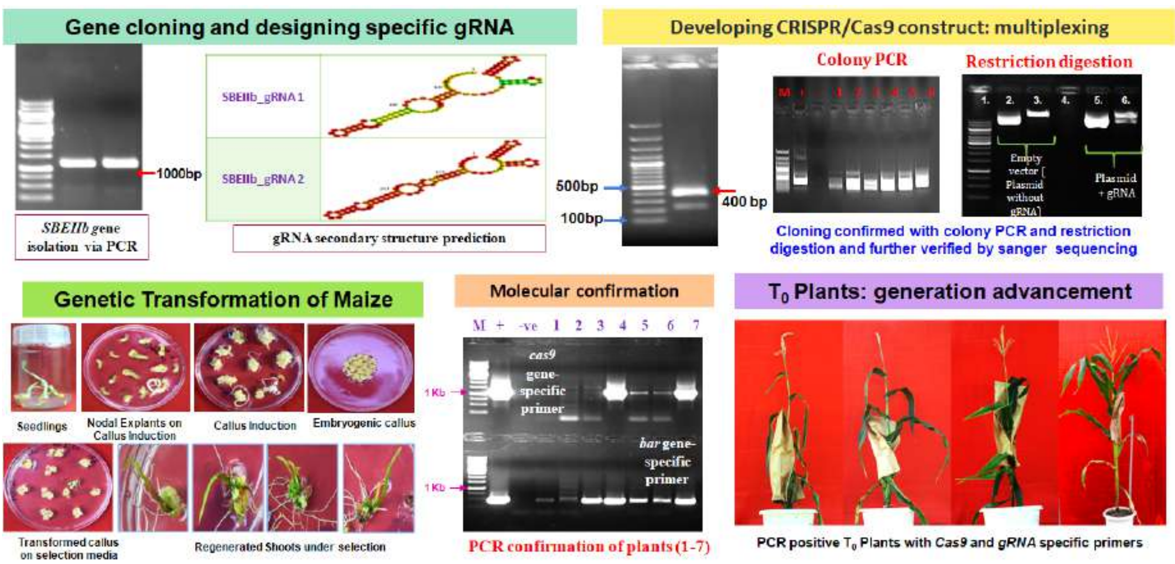


Figure 2.1: Schematic representation of genome-editing construct development and genetic transformation workflow in tropical maize for generating Starch Branching Enzyme II (*ZmSBEII*) knockout mutants.

Provisional Patent on a Process for Aflatoxin Management in Maize

A provisional patent application entitled **"A Post-Harvest Risk Management System for Preventing Mycotoxin Contamination in Cereal Grains Through Adaptive Fungistatic Treatment" (Application No. 202611038663)** has been filed to address the persistent challenge of aflatoxin contamination in maize during post-harvest storage.

The development process involved screening multiple candidate technologies for their ability to inhibit microbial growth. As shown in **Figure 2.2**, several options were evaluated, including silica gel, ethylene, an IIMR-developed suppressor formulation, and volatile organic compound (VOC) tablets. These materials were tested in controlled laboratory conditions to assess their effectiveness in restricting fungal development. Among the evaluated treatments, the IIMR suppressor formulation demonstrated superior fungistatic activity and was selected for further validation.

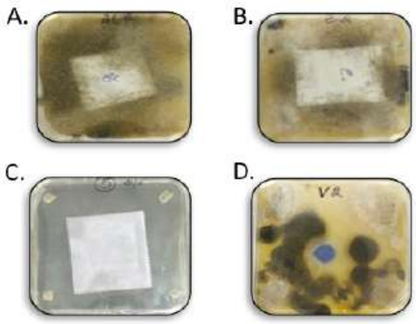


Figure 2.2: Screening of multiple options including (A) Silica gel, (B) Ethylene, (C) IIMR 'suppressor' formulation, & (D) VOC Tablets, on microbial growth.

The efficacy of the suppressor formulation was subsequently assessed using sealed Petri plate assays containing potato dextrose agar (PDA) medium (**Figure 2.3**). In these experiments, untreated control plates exhibited extensive fungal growth and microbial colonization, whereas plates exposed to 5% suppressor treatment showed markedly reduced fungal development. The visual comparison clearly demonstrated the ability of the formulation to create an unfavorable environment for fungal proliferation, thereby validating its potential as a post-harvest management tool.

Figure 2.3: Assay of treatments (A) control and (B) 5% 'suppressor' in sealed Petri plates with PDA medium.

To evaluate practical applicability under real storage conditions, maize grain samples harvested during the Kharif 2025 season were subjected to storage trials. Approximately 20 kg of grain at 25% moisture content was stored for six months under two treatments: an untreated control and a treatment with 5% suppressor applied immediately after harvest. At the end of the storage period, the untreated grains showed visible signs of fungal deterioration, discoloration, and quality degradation, whereas the treated grains retained a cleaner appearance with substantially reduced fungal contamination.

The impact of the treatment on aflatoxin accumulation was assessed using a visual kit for total aflatoxins and a quantitative immunoassay for aflatoxin B1. Results revealed a striking difference between the two treatments. The untreated grain sample tested strongly positive for aflatoxin contamination, with a measured aflatoxin B1 concentration of approximately 430 ppb, indicating severe mycotoxin accumulation during storage. In contrast, the suppressor-treated grain sample tested negative for aflatoxin and contained only 3 ppb aflatoxin B1, representing a dramatic reduction in contamination levels and remaining well within safe limits.

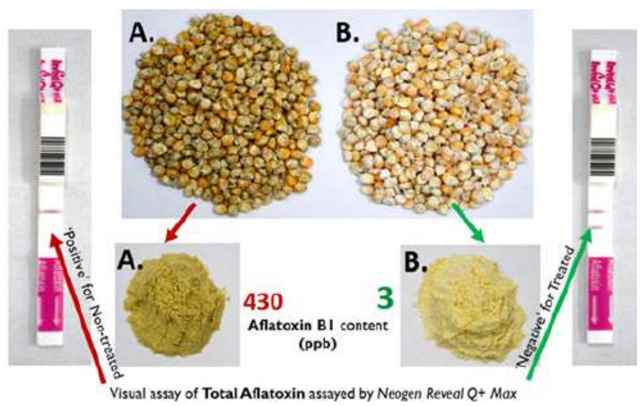


Figure 2.4: Effect of post-harvest suppressor treatment on aflatoxin contamination in maize during storage.

CHAPTER-3

CROP PRODUCTION

India's agricultural future increasingly depends on moving beyond the traditional rice–wheat rotation, which is constrained by high water demand, rising energy costs, and declining sustainability. The comprehensive evaluation of maizebased and diversified cropping systems, nutrient management trials, and seasonal yield analyses undertaken at ICAR-IIMR provides nationally significant evidence that improved agronomic management can bridge yield gaps and unlock the genetic yield potential of maize. By demonstrating that technologyenabled diversification, precision nutrient application, and optimized planting practices can simultaneously enhance productivity, reduce resource use, and strengthen resilience to climatic variability, this work offers a pathway for sustainable intensification at scale. Its importance lies in guiding national strategies for food security, feed supply, and bioeconomy growth, positioning maize as a cornerstone crop for India's agricultural transformation.

Performance of diversified cropping systems under technology-enabled resource management

A field experiment on crop diversification was initiated at ICAR-IIMR, Ludhiana, during the *Rabi* season of 2024-25 to evaluate seven diversified cropping systems in comparison with the conventional rice–wheat (RW) system. In the first year of evaluation, all alternative systems except the cotton–wheat (CW) system recorded a significant improvement in system productivity, ranging from 36 to 89% higher than that of the rice–wheat system. Among these, the rice–potato-maize (RPM) system emerged as the most productive; however, this system had higher irrigation water demand, increased input and energy use, and consequently had greater production costs, highlighting its limited potential and scalability with long-term sustainability under resource-constrained conditions.

In contrast, maize-based diversified cropping systems [maize-wheat-mungbean (MWMb), maize-mustard-sunflower (MMuSf), maize-mustard-mungbean (MMuMb), and soybean-green pea-maize (SGpM)] integrated with sustainable and improved production technologies, such as efficient water management through subsurface drip irrigation, precision nutrient application, and residue retention, demonstrated a more balanced performance. These systems not only enhanced system productivity by 33.6–56% over the conventionally managed rice–wheat system, but also reduced irrigation water use by 66–75% and lowered energy consumption by 13.9–36%. Furthermore, the adoption of these cropping systems substantially enhanced resource-use efficiency and economic returns. This indicates that technology-enabled diversification can improve resource-use efficiency while enhancing productivity, thereby offering a more sustainable alternative to traditional cropping practices in the region.

Performance of maize-based cropping systems and comparison with the conventional rice–wheat system

Assessment of maize-based cropping systems under different management practices was carried out in comparison with the conventional rice–wheat (RW) system to evaluate productivity, biomass accumulation, and system performance under kharif conditions. Four maize-based treatments under maize–wheat–mungbean (MWM) systems and one rice-based treatment under RW system were evaluated. Since the MSP of maize (₹2400/q) and paddy (₹2369/q) were nearly similar, actual grain yield and maize equivalent yield values were comparable. The present analysis includes only *Kharif* season crop productivity and does not include wheat and mungbean yields of the cropping systems. Results revealed that maize-based systems recorded substantially higher productivity over the rice-based system. Among the treatments, CA 100% R produced the highest mean grain yield (7.6 t/ha), followed by CA 1/3 R representing 54.0% and 51.1% higher productivity, respectively, over the RW system Similarly, MWM with R and MW without R recorded 27.7% and 21.1% higher productivity, respectively, compared to the RW system. Straw yield and biological yield were also higher under maize-based systems, indicating greater biomass production potential. Statistical analysis showed significant treatment effects on grain yield, straw yield, and harvest index, while correlation analysis indicated positive associations between plant height, biomass accumulation, and grain yield. The findings demonstrate the potential of diversified maize-based systems as productive and sustainable alternatives to the conventional rice–wheat system under north-western Indian conditions.

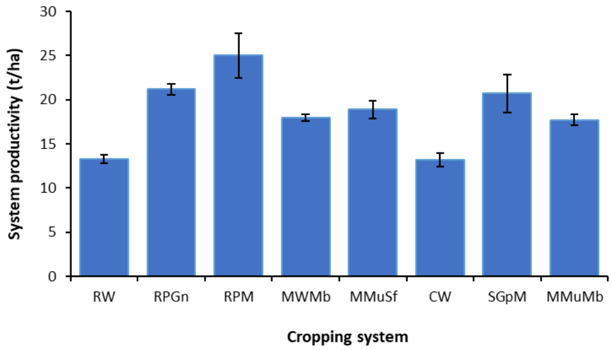


Figure 3.1: System productivity under different cropping systems during 2024-25

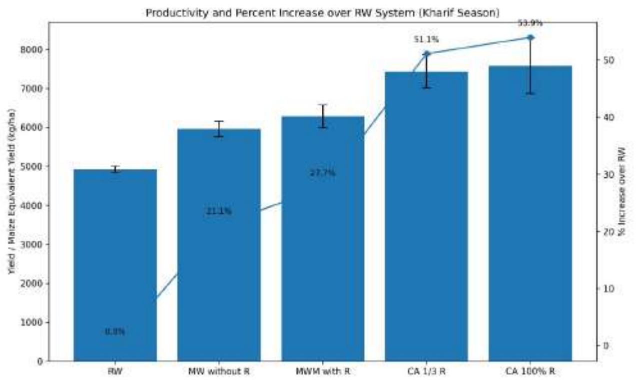


Figure 3.2: Productivity and percentage increase of maize-based cropping systems relative to the rice-based system.

Response of three maize hybrids to integrated basal and foliar zinc fertilization during *Kharif* 2025

A field trial was conducted during Kharif 2025 to evaluate the response of previously identified three maize hybrids IMH 228, IMH 222, and COH(M) 6 to a 3 × 3 factorial of soil-applied basal zinc (0, 2.5, 5.0, and 7.5 kg Zn/ha) combined with foliar zinc sprays (no spray, 0.5%, and 1.0% $ZnSO_4$). Across all hybrids, yield increased steadily with increasing basal zinc and was further improved by foliar application. The Zn-deficient control (T1: no basal Zn, no foliar) gave the lowest yields of 5.21 t/ha for IMH 228, 4.42 t/ha for IMH 222, and 4.00 t/ha for COH(M) 6 while the highest basal with foliar combination (T8: 7.5 kg Zn/ha + 0.5% foliar) produced the highest yields with a gain of about 22–34% over the control. The response curves showed a clear evidence of a synergistic basal foliar interaction where the 1.0% foliar dose at 7.5 kg basal Zn (T9) gave a marginal pullback versus T8 in all hybrids suggesting 0.5% as the more efficient foliar concentration at high basal rates. Hybrid ranking was consistent across all treatment and had the order of IMH 228 > IMH 222 > COH(M) 6, confirming IMH 228 as the most zinc-responsive hybrid, with the widest spread (≈2.1 t/ha between IMH 228 and COH(M) 6) occurring under the highest Zn treatments. Variability across replicates was low (SD typically 0.04–0.25 t/ha), indicating robust agronomic response. Taken together, the data support a practical recommendation of 7.5 kg basal Zn/ha combined with a 0.5% foliar spray on IMH 228 for maximum gain in productivity under the trial's growing conditions, with the same combination delivering meaningful yield uplift on IMH 222 and COH(M) 6 as well.

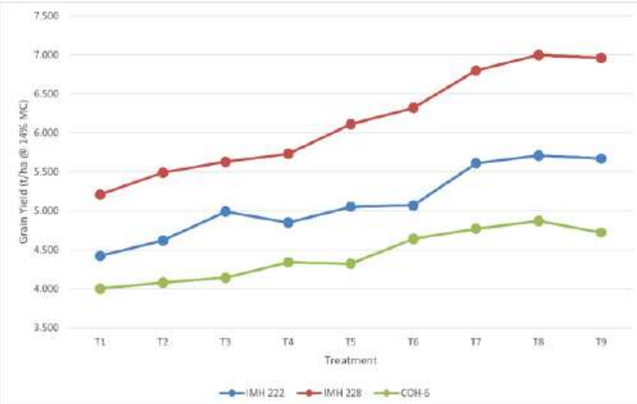


Figure 3.3: Yield of hybrids under different zinc fertilization treatments.

Application of image analysis for area, yield and stress estimation in maize

Accurately and promptly estimating maize acreage, yield, and crop stress remains a complex challenge in India. Traditional groundbased surveys, often conducted with nongeotagged data, are timeconsuming, laborintensive, and limited in spatial resolution. These constraints are compounded by variability in agroclimatic conditions, fragmented land holdings, and inconsistencies in data reporting, all of which hinder effective monitoring and timely decisionmaking. Against this backdrop, the districtwise compilation of maize area, production, and yield for 202324 provides a critical evidence base. It highlights regional disparities in performance and productivity, offering valuable insights into both strengths and vulnerabilities of the maize sector. More importantly, this dataset serves as a cornerstone for advancing targeted interventions, enabling precision farming practices, and integrating modern image analysis tools to refine yield estimation and crop stress monitoring. By bridging the gap between traditional survey limitations and emerging digital technologies, such districtlevel information strengthens the foundation for resilient maize cultivation and informed policy planning.

The analysis of maize acreage and productivity across districts during *Kharif* 2023, *Rabi* 202324, and spring 2024 reveals significant temporal shifts and spatial contrasts that shape India's maize economy (Fig. 3.4 and 3.5). In *Kharif* 2023, maize occupied the largest area, particularly in rainfed belts of Madhya Pradesh, Karnataka, Telangana, and Bihar. This season underscores maize's role as a monsoon crop, yet productivity remained uneven higher in irrigated southern districts but constrained in eastern states where rainfall variability and flood risks reduced yields.

In contrast, *Rabi* 202324 marked a shift in acreage towards eastern and peninsular India, with Bihar and Andhra Pradesh emerging as major contributors. The assured irrigation and cooler winter climate supported higher productivity compared to *Kharif*, demonstrating the advantages of diversifying maize cultivation beyond monsoon dependence. This seasonal expansion reflects farmers' growing confidence in maize as a remunerative winter crop, aided by hybrid adoption and better crop management.

In spring 2024, acreage was limited to northwestern states such as Punjab, Haryana, and western Uttar Pradesh. Despite smaller coverage, productivity was the highest among all seasons, driven by intensive management, mechanization, and favourable agroclimatic conditions. Shortduration hybrids and assured irrigation allowed farmers to achieve remarkable yields, positioning spring maize as a high-efficiency crop system. Spatially, the variability is striking: rainfed districts in central and eastern India continue to show unstable yields, while irrigated northern and southern districts maintain consistent performance. This duality highlights both the vulnerability of maize to climatic fluctuations and the resilience offered by irrigation and technology.

From a broader perspective, the findings suggest that while *Kharif* remains the acreage backbone of maize cultivation, spring and *Rabi* seasons are increasingly critical for yield stability and national output. Expanding maize cultivation in irrigated belts during nonmonsoon seasons could reduce dependence on erratic rainfall, enhance food and feed security, and support India's growing demand for maize in poultry, starch, and ethanol industries.

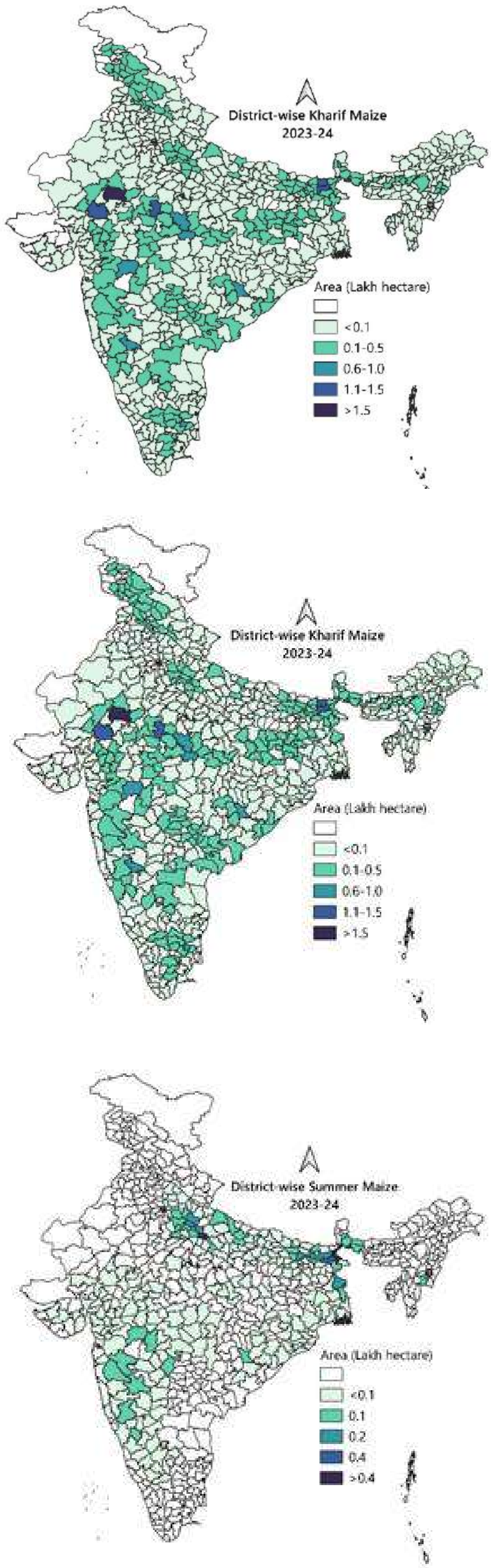


Figure 3.4: Acreage of maize in different districts of India during kharif 2023, rabi 2023-24 and spring 2024.

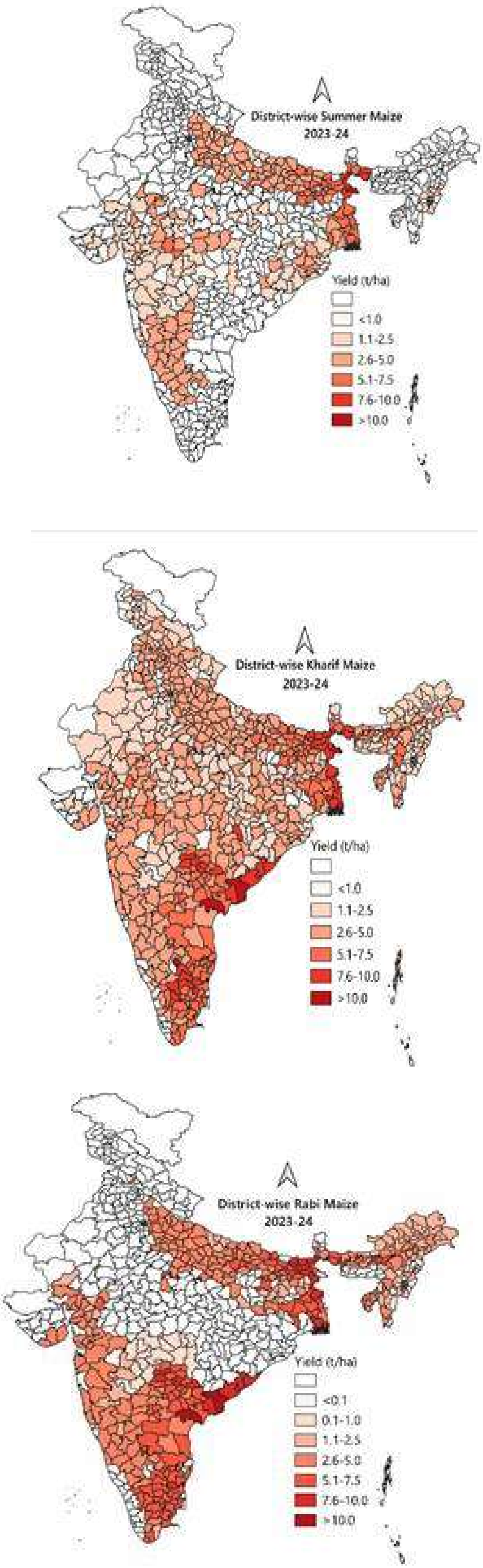
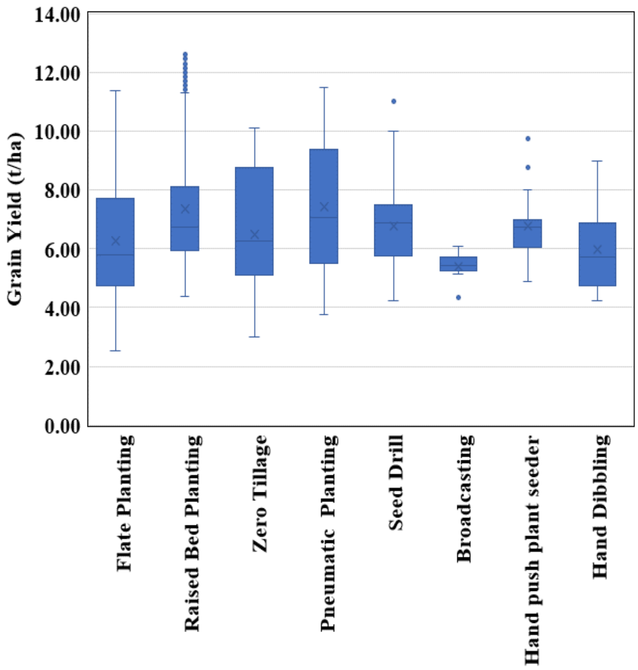


Figure 3.5: Productivity of maize in different districts of India during kharif 2023, rabi 2023-24 and spring 2024.

Best production practices for enhanced productivity and profitability in maize--based cropping system

Nationwide analysis of maize yield patterns highlights the significant influence of both planting method and planting time on productivity. As illustrated in **Fig. 3.6**, mechanized and precision planting methods consistently outperform traditional approaches, ensuring uniform plant stands, improved soil–seed contact, and more efficient use of inputs. This translates into higher grain yields and greater profitability at scale. Similarly, **Fig. 3.7** demonstrates that sowing maize within the optimal agroclimatic window is critical for maximizing yield potential. Delayed planting exposes crops to moisture stress, pest pressure, and shortened growing periods, leading to reduced productivity across regions. Overall, spring is coming up as the best ecology for yield point of view in India. The late *Kharif* is the least yielding season in India amongst wide range of sowing window observed in India.

These findings emphasize the importance of embedding best production practices into maizebased cropping systems. Adoption of improved seed varieties, balanced nutrient management, conservation agriculture techniques, efficient water and weed control, and integrated pest management, when combined with precision planting and timely sowing, can substantially enhance productivity and profitability nationwide. Tailoring these practices to diverse agroecological zones strengthens resilience against climatic variability and ensures resourceuse efficiency. By integrating improved and entirely new agronomic strategies, maizebased systems can drive sustainable intensification, reduce input costs, and unlock the full potential of maize as a cornerstone of India’s food security, feed supply, and emerging bioeconomy.



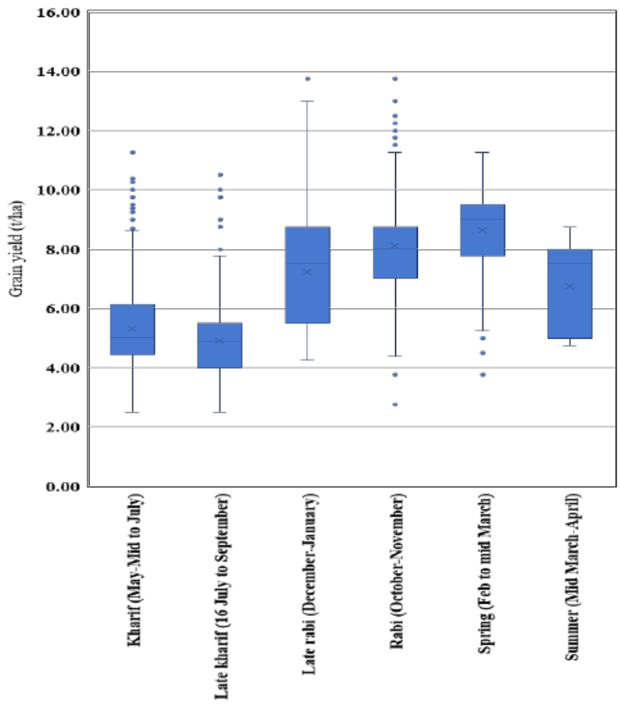


Figure 3.6: Effect of various planting method on the grain yield of maize

Figure 3.7: Effect of different planting time on the yield of maize in India

CHAPTER-4

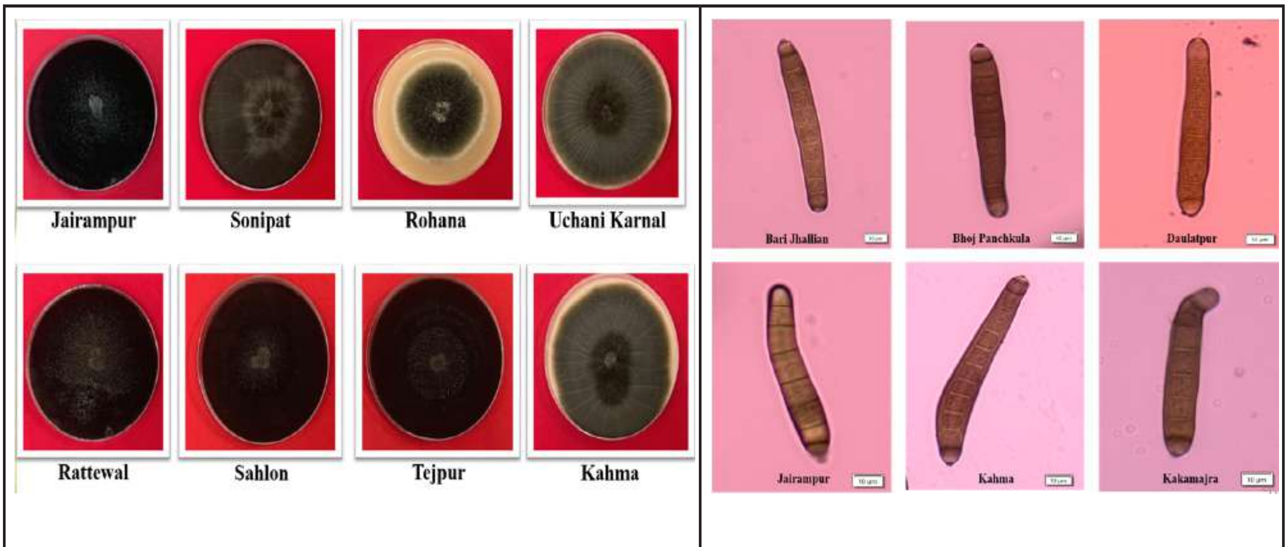
CROP PROTECTION

Maydis Leaf Blight (MLB)

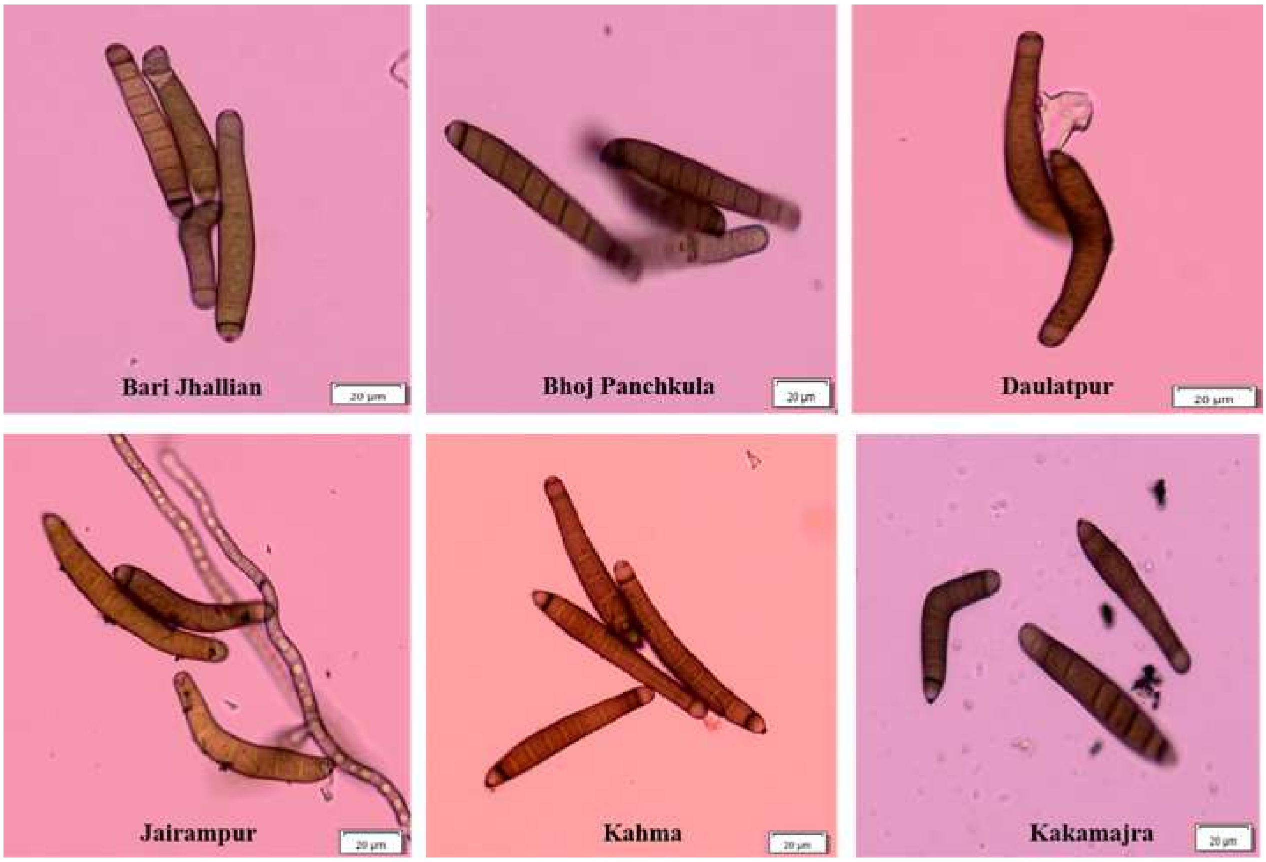
During the period, a total of 62 diseased leaf samples showing symptoms like MLB disease, were collected from different farmer's maize fields of Punjab and Haryana states in India. Isolations from these diseased samples were carried out on Potato Dextrose Agar (PDA) medium according to standard methodology. Of these, thirty-five isolates were obtained and purified by the hyphal-tip method. All isolates are preserved by the paper disc method and glycerol stocks in -20°C freezer and as PDA slants at 4°C in laboratory refrigerator for long-term as well as short-term storage.

Morphological studies revealed significant variation in conidial length, width and number of septa per conidium. The average conidial length of MLB isolates was observed to be 67.4 µm with the smallest conidium of Garhi Ajit Singh (Punjab) isolate (24.4 µm) and the largest of Sahlon (Punjab) isolate (124.8 µm). Likewise, the average conidial width of MLB isolates was observed to be 11.8 µm with the minimum in Garhi Ajit Singh (Punjab) isolate (7.6 µm) and the maximum in Uttal (Punjab) isolate (22.2 µm). Similarly, the mean number of conidial septa was 6.7, with the maximum observed in isolates from Kakamajra, Ambala (Haryana). Additionally, hyphal width of MLB isolates is varied from 4.4 - 8.5 µm as shown in Figure 4.1.

Furthermore, a set of 12 susceptible and resistant maize genotypes was maintained and used for screening pathogenic variability among *B. maydis* isolates (Table 4.1). Among these, ABSH-4, IML-103 and IMR-331 possess different cytoplasmic male sterility (CMS) germplasm backgrounds, *viz.,* CMS-T, CMS-C and CMS-S, respectively. Among the genotypes tested, LM-13, LM-14 and ABSH-4-1 (CMS-T) exhibited resistant reactions against the Ludhiana isolate, whereas CM-400, CM-500 and CM-600 showed susceptible reactions. The resistant response of ABSH-4-1 (CMS-T) against Ludhiana isolate suggests that this isolate likely belongs to the race-O rather than the race-T.



A. Mycelial Morphology | B. Conidial Morphology (40X)



C. Conidial Morphology (20X)

Table 4.1: Pathological studies of Bipolaris maydis Ludhiana isolate under field conditions (Design- RBD, Rep.- 6)

S. No.	Genotype	Ludhiana	Reaction	S. No.	Genotype	Ludhiana	Reaction
1.	BML-6	6.3	MS	7.	CM-400	8.0	S
2.	BML-7	5.0	MR	8.	CM-600	7.1	S
3.	LM-14	2.7	R	9.	IML-103	5.3	MS
4.	LM-13	2.6	R	10.	IMR 331	4.5	MR
5.	CM-500	7.2	S	11.	ABSH-4-1	3.0	R
6.	CM-501	6.1	MS	12.	RCRMH-4-1	4.8	MR

Turcicum Leaf Blight (TLB)

Molecular characterization of four *Exserohilum* isolates, *viz.,* Ero_DWD-20, Ero_DWD-27, Ero_Mya-1 and Ero_Rri-1, was performed using ITS, LSU and β-tubulin markers. The obtained sequences were aligned with representative sequences of *E. turcicum*, *E. rostratum* and *Bipolaris maydis*, retrieved from the NCBI database using the CLUSTALW program. A phylogenetic tree was subsequently constructed in MEGA7 with 1,000 bootstrap replicates (Figure 4.2). Phylogenetic analysis revealed that all four *Exserohilum* isolates from maize (highlighted by a red bracket) clustered with *E. rostratum* rather than *E. turcicum*.

Furthermore, Koch's postulates were verified for these isolates (Figure 4.3). The pathogenicity assay confirmed that *E. rostratum* infects maize and produces symptoms typical of turcicum leaf blight (TLB). Upon re-isolation, conidia characteristic of *E. rostratum* were consistently observed (Figure 4.4), confirming its role in the etiology of the disease. This study constitutes the first report of *Exserohilum rostratum* as the causal agent of turcicum leaf blight of maize in India.

Figure 4.3: Koch postulate studies of Exserohilum rostratum isolates at Larnoo centre using Larnoo Local cultivars

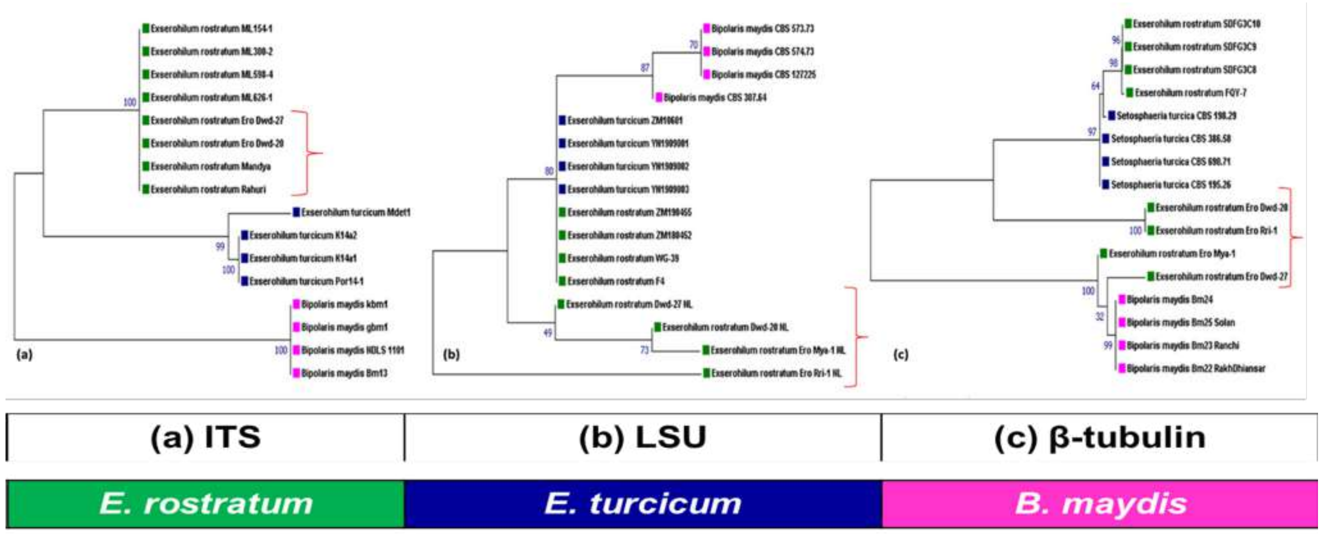
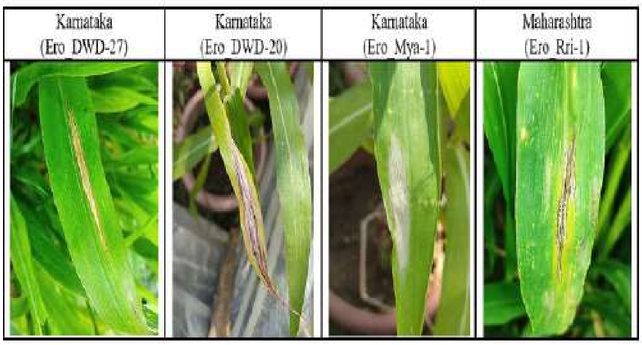


Figure 4.2: Maximum Likelihood (ML-Tamura-Nei) model of phylogenetic tree comprising of (a) ITS, (b) LSU and (c) β-tubulin sequences of *Exserohilum rostratum* (ITS-8); (β-TUB-8); (LSU-8), *Exserohilum turcicum* (ITS-4); (β-TUB-4); (LSU-4), *Bipolaris maydis* (ITS-4); (β-TUB-4); (LSU-4). All the sequences were aligned using CLUSTALW, and the phylogenetic tree was constructed using MEGA7 with 1000 bootstraps. Four identified isolates of *E. rostratum* in maize are highlighted by a red bracket.



Development of sustainable management tools for major insect pests of maize

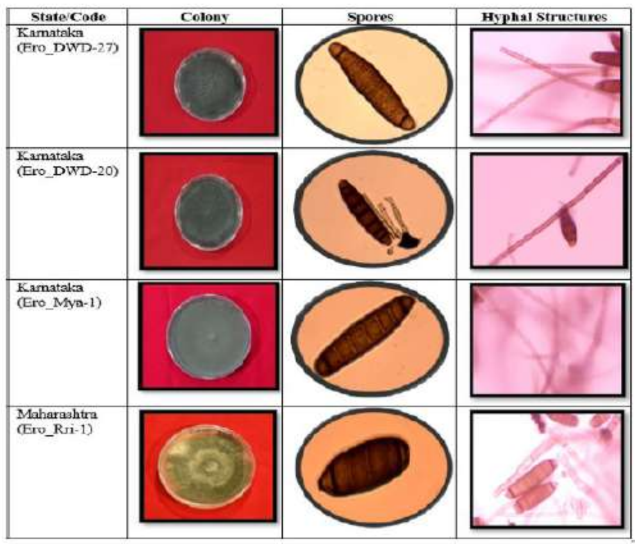


Figure 4.4: Morphological characterization of Exserohilum rostratum isolatesIdentification of resistant sources against spotted stem borer, Chilopartellus (Swinhoe)

1. Identification of resistant sources against spotted stem borer, *Chilo partellus* (Swinhoe)

Spotted stem borer, *Chilo partellus* (Swinhoe) is one of the important pest of *Kharif* maize causing 26 to 80% yield losses in different agroecological regions of India (Panwar 2005). The typical damaging symptoms of maize stem borer is characterized by bored holes on stems and destroyed internal stem tissue, resulting in tunnels and rotten insect and plant tissue debris inside the stems. A total of 267 maize genotypes along with resistant (DMRE 63, CM 500) and susceptible checks (CM 202) were screened under artificial infestation against spotted stem borer during *Kharif* 2025 at WNC, ICAR-IIMR Hyderabad. The resistant, moderately resistant, and susceptible genotypes were categorized by LIR 1.0-3.0, >3.1-6.0, and >6.1-9.0, respectively. None of the genotypes were found resistant against SSB, while 32 genotypes were moderately resistant.

2. Identification of resistant sources against pink stem borer, *Sesamia inferens* Walker

Pink stem borer, *Sesamia inferens* Walker is the significant pest of *Rabi*/winter maize causing yield losses ranging 25.7-78.9% (Rao 1983) by boring into stems. One hundred sixty-eight inbred lines, along with resistant (DMRE 63, CM 500) and susceptible checks (CM 202), were screened under artificial infestation against pink stem borer (SSB) during *Rabi* 2024-25. The resistant, moderately resistant, and susceptible lines were grouped based on LIR of

1-3, >3.1-6 and >6.1-9, respectively. Five genotypes CML 337 (2.47), DHO-82-7 (2.50), MIL 2-154-1 (2.5), MIL-2-1721-3 (2.79) were found promising against pink stem borer under artificial infestation, while 105 were moderately resistant.

3. Identification of resistant sources against fall armyworm, *Spodoptera frugiperda* (J.E.Smith)

Fall armyworm *Spodoptera frugiperda* (J.E.Smith) is the most destructive invasive insect pest of maize causing yield losses ranging between 20-50% (Murua et al. 2006) by feeding on plant foliage and reproductive parts. A total of 252 lines and 285 maize genotypes were evaluated for foliar resistance at the V5 leaf stage under artificial infestation against fall armyworm during *Rabi* 2024-25 and *Kharif* 2025, respectively. The resistant, moderately resistant, and susceptible genotypes were categorized by LDR 1.0-3.0, >3.1-6.0, and >6.1-9.0, respectively. Among 252 lines, three lines, i.e. MIL-2-325-1 (2.88), V412 (2.78) and IC 212929 (2.17) were found promising, while 146 were moderately resistant. Out of 285, two lines 2420109 (2.10), 2420177 (2.18) were found promising against fall armyworm while 31 were moderately resistant.

4. Determination of induced defense responses

Fall armyworm (FAW) feeding, and wounding followed by regurgitant application, induced total phenolics and hydroxycinnamic acids mediated defense responses in maize. Resistant genotypes MIL 9-1309 and MIL 9-1308 exhibited elevated phenol levels (1.98 mg/g and 2.50 mg/g) in response to insect feeding and wounding followed by regurgitation, respectively (Figure 4.5). In contrast, the susceptible genotype Sarhad HSRB showed the lowest phenol accumulation (0.37 mg/g) under MeJA treatment, which likely contributes to its susceptibility to FAW. Resistant genotype MIL 9-1309 showed elevated levels (1265.69µg/g) of ferulic acid content with wounding followed by regurgitant application (Figure 4.6) whereas in case of p-Coumaric acid, the moderately resistant genotypes MIL 9-1260 (1589.81 µg/g) and MIL 9-1179 (1456.66 µg/g) showed strong induction under insect feeding compared to susceptible genotypes (Figure 4.7). The present study indicates that maize phenolic defense responses were highly induced by FAW attack and wounding followed by regurgitant application in most of the resistant and moderately resistant genotypes.

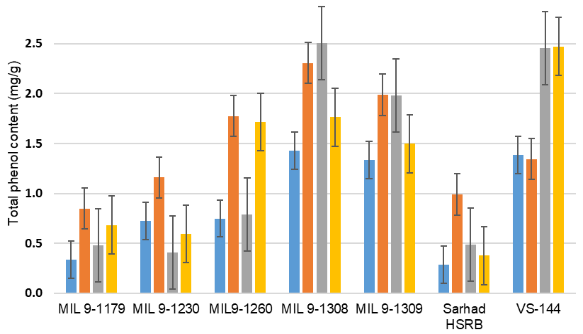


Figure 4.5: Changes in total phenol content in maize genotypes under different induced treatments

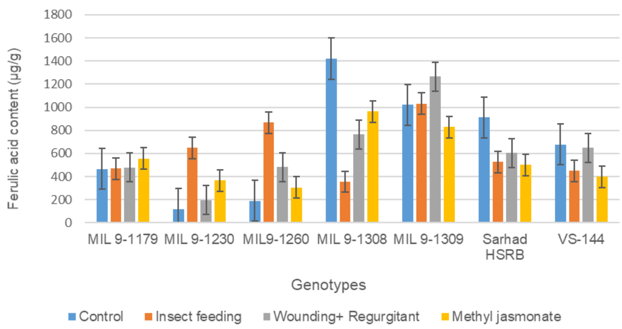


Figure 4.6: Changes in ferulic acid content in maize genotypes under different induced treatments

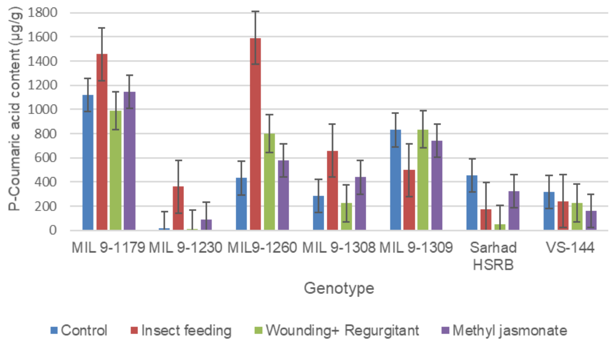


Figure 4.7: Changes in p-Coumaric acid content in maize genotypes under different induced treatments

CHAPTER-5

EXTENSION & OUTREACH

Extension and Outreach programmes

ICAR-IIMR, Ludhiana have a dynamic extension and outreach programme aimed at engaging stakeholders and complementing its research mandate. The institute reaches farmers and other beneficiaries through several initiatives, including Frontline Demonstrations (FLDs) under the National Food Security Mission (NFSM), supported by the Department of Agriculture and Cooperation, Government of India. Other key programmes include the Scheduled Tribe Component (STC), North Eastern Hill (NEH) Component, Scheduled Caste Sub Plan (SCSP), the Agribusiness Incubation Centre (ABI), and the Agri-Drone project.

In addition, the institute is implementing various national projects such as Enhancement of Maize Production in Catchment Areas of Ethanol Industries, Upscaling of Maize-Based Silage Value Chain in Punjab and Haryana, the District Mineral Foundation (DMF) project in Koraput, and the DBT-KISAN project, among others, covering diverse regions across the country.

Frontline demonstration under NSFM

During the Rabi 2024–25 season, 16 centers implemented Front Line Demonstrations (FLDs) on 1,388 hectares, benefiting a total of 3,018 farmers (Table 5.1 & fig 1 & 2). The average yield increase compared to farmer practices during the season was 16.89%, ranging from 8.66% in Peddapuram to 46.11% in Kalyani. In the Spring of 2025, FLDs were conducted on 337 ha, benefiting 719 farmers, and resulted in a recorded mean yield increase of 18.76%. In the Kharif season of 2025, FLDs were expanded to cover 1,731.19 ha, benefiting 4,072 farmers. These demonstrations exhibited a yield increase of 38.19% over farmer practices, attributed to the adoption of improved technologies, with variations observed from 10.97% in Mandya to an impressive 79.13% in Kalyani. Overall, FLDs covered 3,456.19 ha, benefiting 7,809 farmers. Krishi mapper were done for each demonstration.

The FLDs also showcased recently released public sector hybrids such as IMH 222, IMH 223, IMH 225, IMH226, PMH 17, NK 30, JK 502, SQPMH 1, CO6, DHM 206.

Table 5.1 Centre-wise, season-wise NFSM FLD conducted in maize

Sr. No	State	Area(ha)	Yield (q/ha)		Diff. +/- in q/ha	Yield Gain (%)	No. of FLD
		Achievement	FLD	FP			
	Rabi 2024-25						
1.	AAU, Gossaingaon	100	62.84	48.7	14.14	29.03	269
2.	BCKV, Kalyani	116.6	95	65.02	29.98	46.11	204
3.	DrRPCAU, Dholi	14	78.39	69.39	9	12.97	23
4.	CRS, Bahraich	21	72.44	87.19	14.75	20.36	59
5.	RMRSPC, Begusarai	100	98.99	86.28	12.71	14.73	250
6.	MPKV, Kolhapur/Rahuri	100	53.72	48.06	5.66	11.78	249
7.	PJTSAU, Karimnagar	200	88.3	78.09	10.21	13.07	500
8.	ANGRAU, Peddapuram	200	80.05	73.67	6.38	8.66	322
9.	TNAU, Coimbatore	242	60.09	52.09	8.6	16.51	430
10.	UAS, Dharwad	18	66.81	59.1	7.71	13.04	26
11.	UAS, Mandya	14	51.7	44.4	7.3	16.44	30
12.	WNC, IIMR, Hyderabad	50	72.03	65.32	6.71	10.28	125
13.	TNAU, Vagarai	100	75.79	68.22	7.57	11.1	250
14.	AAU, Godhara	8	40.03	32.12	7.92	24.65	20
15.	JNKVV, Chhindwara	24.4	65.13	52.63	12.5	23.75	61
16.	ARS, Banswara	80	87.63	71.29	16.34	22.92	200
	Total/mean (Rabi 2024-25)	**1388**	**69.99**	**59.88**	**10.11**	**16.89**	**3018**

	Spring 2025						
1.	GBPUAT, Pantnagar	50	86.2	80.3	5.9	7.35	49
2.	IIMR, Ludhiana	80.8	90.6	70.84	19.77	27.91	161
3.	CCSHAU, Karnal	100	95.28	73.82	21.47	29.08	250
4.	IFTM, Moradabad	50	77.78	67.7	10.08	14.89	125
5.	CRS, Bahraich	27	78.93	65.2	13.74	21.07	61
6.	DrRPCAU, Dholi	29.2	77.16	68.18	8.99	13.18	73
	Total/mean (Spring 2025)	**337**	**84.33**	**71.01**	**13.32**	**18.76**	**719**
	Kharif 2025						
1.	CAU, Imphal	50	39.1	31.33	7.77	24.81	125
2.	VPKAS, Almora	12.18	42.2	25.5	16.7	65.49	63
3.	SKUAST, Srinagar	150.3	60.3	42.9	17.4	40.56	368
4.	IIMR, Ludhiana	24	50.3	33.5	16.8	49.95	60
5.	PAU, Ludhiana	100	47.39	41.82	5.57	31.32	250
6.	BCKV, Kalyani	55.39	86.49	48.28	38.21	79.13	131
7.	BHU, Varanasi	117.3	damaged by flood				181
8.	OUAT,Bhubaneshwar	50	53.47	30.71	22.76	74.12	125
9.	BAU, Ranchi	52.8	32.18	22	10.18	46.26	285
10.	CRS, Bahraich	50	69.88	54.67	15.21	27.82	184
11.	RMD College, Ambikapur	76.8	46.24	35.09	11.15	31.77	192
12.	DrRPCAU, Dholi	68	55.56	45.84	9.72	21.21	170
13.	RMRSPC, Begusarai	50.02	66.3	45.37	20.93	46.13	84
14.	MPKV, Kolhapur/ Rahuri	160	54.97	48.13	6.84	14.22	382
15.	TNAU, Coimbatore	90	67.38	59.6	7.78	13.05	175
16.	UAS, Dharwad	180	60.7	52.87	7.82	14.79	289
17.	UAS, Mandya	88	52.93	47.7	5.23	10.97	220
18.	TNAU, Vagarai	40	71.78	64.38	7.4	11.5	100
19.	AAU, Godhara	8	32.79	28.18	4.61	16.36	20
20.	JNKVV, Chhindwara	82.4	55.71	42.69	13.02	30.5	103
21.	MPUAT, Banswara	20	47.34	34.9	12.44	35.64	50
22.	MPUAT, Udaipur	206	37.85	24.17	13.68	56.61	515
	Total/mean (Kharif 2025)	**1731.19**	**59.6**	**43.13**	**16.47**	**38.19**	**4072**

#FLD-front line demonstration; FP-Farmer practice

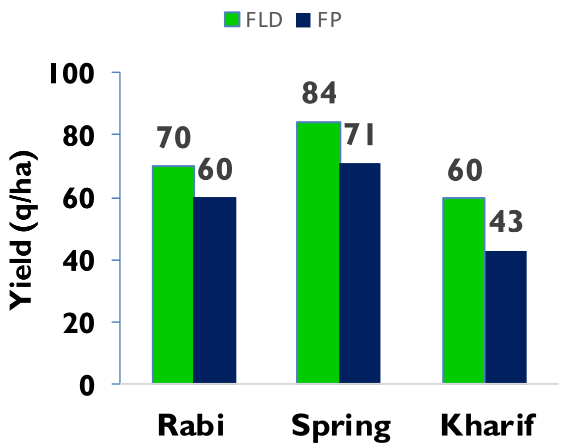


Figure 5.1: Average maize yield during *across season* in FLDs (in green) and farmers' Practices (in blue)

Input Distribution for FLD by Kolhapur

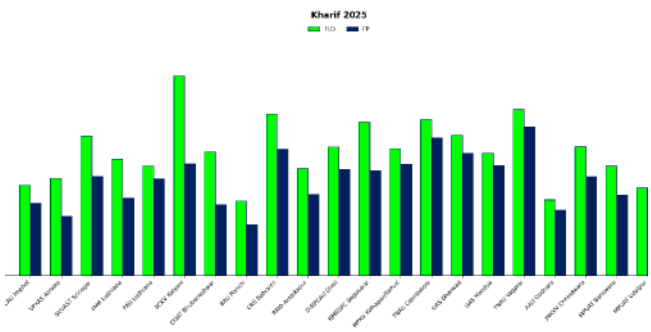


Figure 5.2: Maize Yield during *rabi* 2024-25 In FLDs (in green) and farmers' Practices (in blue)

Input Distribution by AAU, Godhara

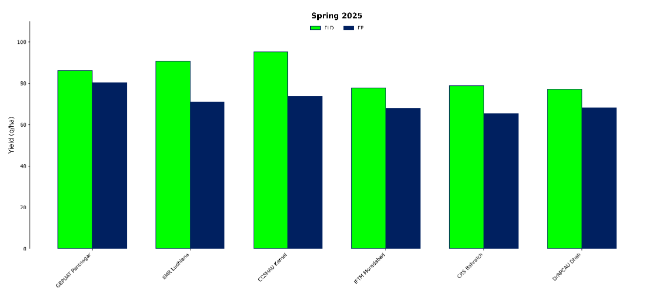


Figure 5.3: Maize Yield during *Spring* 2025 in FLDs (in green) and farmers' Practices (in blue)

FLD organized by Chhindwara centre

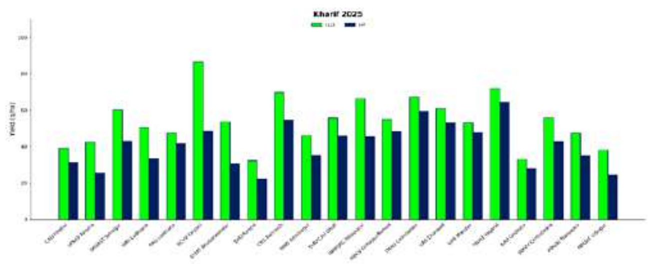


Figure 5.4: Maize Yield during *kharif* 2025 in FLDs (in green) and farmers' Practices (in blue)

Officials visted FLD sites at Coimbatore

Scheduled Tribe Component (STC)

Under STC, in Rabi 2024–25, FLDs were taken up on 141.6 ha of land benefitting 352 farmers (Table 5.2). An average yield gain of 32.24% (8.79% in Vagarai to 99.96% in Kalyani) was observed. During Spring 2025, FLDs were conducted on 15 ha area and benefited 40 farmers. Maize was introduced as a new crop at GBPUAT, Pantnagar, and hence no comparative yield gain data was available. During Kharif 2025, 569.8 ha FLDs were conducted and benefitted 1,531 farmers. An average yield gain of 45.60% was recorded over farmers' practices, which varied from 14.93% in Mandya to 125.64% in Kalyani.

Under the STC, 48 farmers' training/field day/awareness programmes were conducted in different parts of the country on various aspects of scientific maize cultivation, benefiting 2968 tribal farmers which include 759 women farmers (Table 5.3). More than 4689 households also benefitted from the input distributions (Table 5.4).

Table 5.2: Centre-wise, season-wise TSP FLD conducted in maize

Centre	Area (ha)	Yield (q/ha)		Yield Gain (%)	No. of FLD
		FLD	FP		
Rabi 2024-25					
AAU, Gossaigaon	20	64.50	50.20	46.11	50
BCKV, Kalyani	30	90.02	45.02	99.96	73
MPKV, Kolhapur	20	51.80	39.10	32.48	50
PJTSAU, Karimnagar	15.6	88.68	80.69	9.90	39
ARS, Banswara	30	89.54	64.54	38.74	75
MMRS,Godhra	6	40.00	32.00	25.00	15
MRS, TNAU, Vagarai	20	58.20	53.50	8.79	50
Total/ average	**141.6**	**68.96**	**52.15**	**32.24**	**352.0**
Spring 2025					
GBPUAT, Pantnagar#	15	86.1	-	-	40
Kharif 2025					
RMDCARS, Ambikapur	70	48.80	28.40	71.83	178
BHU, Varanasi	30	55.02	35.00	57.20	69
BCKV, Kalyani	20	90.30	40.02	125.64	100
MPKV, Kolhapur	40	58.02	49.20	17.93	100
UAS, Mandya Centre	100	60.80	52.90	14.93	250
SKUAST, Srinagar	90	38.40	26.70	43.82	210
ZARS, JNKVV, Chhindwara	50	52.01	41.07	26.64	63
ARS, Banswara	20	48.14	39.33	22.40	50
MPUAT, Udaipur Centre	46.4	40.95	27.19	50.61	170
OUAT, Bhubaneswar	30	52.87	32.47	62.83	100
BAU, Ranchi	66.2	31.73	18.70	69.68	223
MMRS,Godhra	7.2	33.00	28.00	17.86	18
Total/ average	**569.8**	**50.84**	**34.92**	**45.60**	**1531.0**

 # No competitive crops or non-beneficiaries were available for comparison.

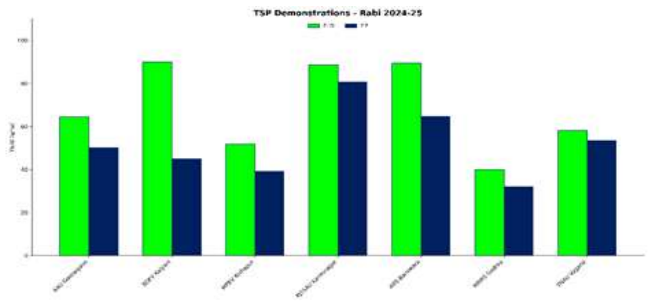


Figure 5.5: Maize Yield during *rabi* 2023-24 in FLDs (in green) and farmers' Practices (in blue) under TSP

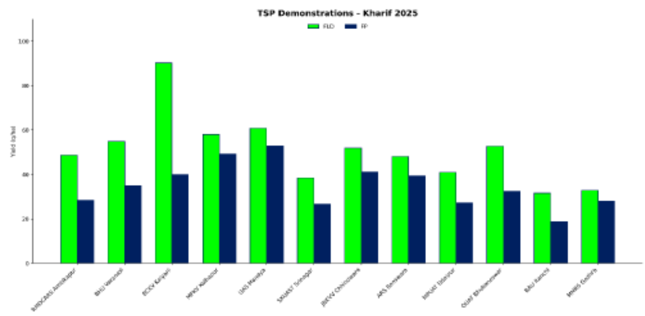


Figure 5.6: Maize Yield during Kharif 2024 in FLDs (in green) and farmers' Practices (in blue) under TSP

Input Distribution for FLD by AAU, Godhara

Field day organized by Karimnagar centre

Inputs distrbution by Banswara centre

Input distribution/Training programme organized by Vagarai centre

Inputs distrbution by Peddapuram centre

Inputs distrbution by Kalyani centre

Table 5.3: Details of training programme conducted under TSP

S. No.	Centre	Date	Location (Village, Block, District)	Type	Programme Title	Beneficiaries	Female
1	RMDCARS, Ambikapur	26.03.2026	Dumki, Amdi, Lundra, Surguja	T	Improved maize cultivation practices	30	7
2	AAU, Gossaigaon	17.01.2025	Amlaiguri, Kochugaon, Kokrajhar	T	Hybrid maize production technology	25	15
3	AAU, Gossaigaon	20.01.2025	Majatigaon, Kochugaon, Kokrajhar	T	Hybrid maize production technology	25	2
4	AAU, Gossaigaon	21.03.2025	Majatigaon, Dotma, Kokrajhar	FD	Field day on maize	58	20
5	BCKV, Kalyani	11.02.2025	Kushumdanga, Binpur II, Jhargram	T, ID	Maize profitability in tribal areas	100	50
6	BCKV, Kalyani	03.07.2025	Mohonpur, Binpur I, Jhargram	T, ID	Maize vs paddy in uplands	100	32
7	MPKV, Kolhapur	07.08.2025	Harankhuri, Dhadgaon, Nandurbar	T, ID, A	Advanced maize cultivation	50	0
8	MPKV, Kolhapur	07.08.2025	Rommal, Dhadgaon, Nandurbar	T, ID, A	Farm women maize training	25	25
9	MPKV, Kolhapur	08.08.2025	Chichinalkuwa, Dhadgaon, Nandurbar	T, ID, A	Advanced maize cultivation	25	0
10	UAS, Mandya	11.07.2025	Magudilu, H.D. Kote, Mysore	T, ID	Maize production & value addition	100	21
11	UAS, Mandya	25.07.2025	Kenchanahalli, H.D. Kote, Mysore	T, ID	Maize production & inputs	150	40
12	PJTAU, Hyderabad	31.10.2025	Ippalapalli, Keshampet, Rangareddy	T, ID	Good maize management practices	25	7
13	GBPUAT, Pantnagar	05.02.2025	Khirana, Sitarganj, U.S. Nagar	T, ID	Spring maize cultivation	40	0
14	GBPUAT, Pantnagar	25.04.2025	Ghuseri, Sitarganj, U.S. Nagar	FD, A	IPM in spring maize	35	5
15	ANGRAU, Peddapuram	31.10.2025	ANGRAU, Peddapuram	T, ID	Managing monkey & bird menace	50	4
16	SKUAST-Kashmir	26.12.2025	Wangath, Ganderbal, Ganderbal	T, A, ID	Scientific maize management	25	5
17	SKUAST-Kashmir	22.01.2026	Kupwara, J & K	T, A	Boosting maize productivity	50	12

18	SKUAST-Kashmir	30.10.2025	Renni, Anantnag, Anantnag	T, ID	Tribal maize strengthening	30	8
19	SKUAST-Kashmir	20.10.2025	Rangreth, Srinagar, Srinagar	A	Tribal farmer empowerment	60	22
20	SKUAST-Kashmir	10.10.2025	Doudkulan, Pulwama, Pulwama	T, ID	Sustainable maize farming	30	9
21	PJTAU, Karimnagar	31.03.2025	Degavath Thanda, Rudrangi, Rajanna Sircilla	T, ID	Good agricultural practices	50	12
22	JNKVV, Chhindwara	20.06.2023	Damaua, Prayasia, Chhindwara	T	Scientific maize cultivation	73	21
23	JNKVV, Chhindwara	25.06.2025	Damaua, Prayasia, Chhindwara	ID	Hybrid maize cultivation	148	35
24	JNKVV, Chhindwara	26.10.2025	Damaua, Prayasia, Chhindwara	FD, A	FAW & ethanol awareness	76	12
25	ARS, Banswara	18.06.2025	ARS, Banswara	T	Crop management & inputs	91	29
26	ARS, Banswara	09.09.2025	ARS, Banswara	T	Crop management & urea	50	12
27	ARS, Banswara	22.11.2025	ARS, Banswara	T	Crop management & urea	60	15
28	ARS, Banswara	23.11.2025	ARS, Banswara	T	Crop management & urea	117	35
29	Maize Research Station, Vagarai	26.03.2025	MRS, Vagarai	T	FAW management	50	11
30	BHU, Varanasi	30.05.2025	Bharari, Chopan, Sonbhadra	T	Training & seed distribution	50	15
31	KVK, Banswara	18.06.2025	KVK, Banswara	T, ID, A	Improved maize production	48	12
32	KVK, Dungarpur	19.06.2025	KVK, Dungarpur	T, ID, A	Improved maize production	48	18
33	KVK, Pratapgarh	19.06.2025	KVK, Pratapgarh	T, ID, A	Improved maize production	50	20
34	KVK, Rajasamand	22.06.2025	KVK, Rajasamand	T, ID, A	Improved maize production	50	15
35	KVK, Rajasamand	22.07.2025	KVK, Rajasamand	T, ID, A	Improved maize production	50	15
36	MPUAT, Udaipur	02.10.2025	Sangwa, Khemli, Mavli, Udaipur	T, ID, A, FD	Improved maize production	130	35
37	OUAT, Bbsr	25.03.2025	Umerkote, Nabarangapur, Odisha	T, ID	Scientific maize production	25	12

38	OUAT, Bbsr	26.03.2025	Umerkote, Nabarangapur, Odisha	T	Scientific maize production	25	8
39	OUAT, Bbsr	01.03.2025	Jashipur, Mayurbhanj, Odisha	T	Scientific maize production	25	9
40	OUAT, Bbsr	25.06.2025	Badabharandi, Umerkote, Nabarangapur	A, ID	Kharif maize capacity building	50	2
41	OUAT, Bbsr	26.06.2025	Ghatabagara, Jeypore, Koraput	A, ID	Kharif maize capacity building	25	3
42	OUAT, Bbsr	02.07.2025	Begunia, Jashipur, Mayurbhanj	A, ID	Kharif maize capacity building	25	12
43	ANDUAT, Bahraich	27.02.2026	Vishunapur, Mihipurwa, Bahraich	T, ID	Spring maize improved practices	81	12
44	MMRS, Godhra	02.07.2025	MMRS, Godhra,Panchmahal	T	Scientific methods of maize cultivation	34	-
45	MMRS, Godhra	17.09.2025	MMRS, Godhra,Panchmahal	T, A	Scientific methods maize cultivation	80	35
46	MMRS, Godhra	08.11.2025	MMRS, Godhra,Panchmahal	T	Scientific methods of maize cultivation	47	-
47	MMRS, Godhra	17.12.2025	MMRS, Godhra,Panchmahal	T	Methods of maize cultivation	30	-
48	MMRS, Godhra	24.12.2025	MMRS, Godhra,Panchmahal	T	New methods of rabi maize cultivation	30	-
Total						**2651**	**689**

T-Training; ID-Input Distribution; FD-Field Days; A-Awareness

Table 5.4: Input distribution under STC

Particulars	Unit	Quantity	Beneficiaries
Maize Seed	kg	7.75	1,617
Other Crop Seeds (Paddy, Cowpea/Rajmash, etc.)	kg	70	25
Fertilizers (Urea, DAP, MOP & SSP)	Tonnes	22.69	606
Plant Protection Inputs (Herbicides, Insecticides,			
Bio-pesticides & Bio-fertilizers)	kg	1,434	2,176
Farm Implements & Small Equipment	No.	1,697	1,730
Information & Extension Materials (Literature)	No.	1,502	1,407

SCSP programme

Under the Scheduled Caste Sub Plan (SCSP) programme, improved maize production technologies were demonstrated on 220 ha of farmers' fields during Rabi 2024–25, Spring 2025 and Kharif 2025, benefiting 573 farmers through Front Line Demonstrations (FLDs).

During Rabi 2024–25, FLDs covered 55 ha and benefited 187 farmers. At PJTAU, Karimnagar, demonstrations recorded a grain yield of 90.99 q/ha against 80.46 q/ha under farmers' practices, resulting in a yield advantage of 13.09%. Demonstrations at BCKV, Kalyani were conducted in rice-fallow areas where comparable farmers' practice data were not available.

During Spring 2025, FLDs were conducted on 125 ha benefiting 315 farmers. At ICAR-IIMR, Ludhiana, demonstrated technologies yielded 68.34 q/ha compared to 62.30 q/ha under farmers' practices, recording a yield gain of 9.70%. Demonstrations at GBPUAT, Pantnagar were conducted in rice-fallow situations without comparable farmers' practice data.

During Kharif 2025, FLDs covered 110 ha and benefited 238 farmers. The demonstrations recorded an average grain yield of 48.8 q/ha compared to 33.5 q/ha under farmers' practices, resulting in an average yield gain of 45.6%. The highest yield advantage was recorded at CAU, Imphal (40.0%), followed by ZARS, JNKVV, Chhindwara (36.4%), CCS HAU, Karnal (29.2%) and MPKV, Kolhapur (15.1%). Demonstrations at BCKV, Kalyani recorded a grain yield of 70.0 q/ha; however, comparable farmers' practice data were not available.

In addition, 35 capacity development programmes, including trainings, awareness programmes and field days, were organized, benefiting 1568 farmers, including 621 women farmers. Various inputs including seed, fertilizers, chemicals, small farm implements and farm literature were also distributed to 6035 SC households. Five food processing equipment units (Industrial Oven, Sealing Machine, Weighing Balance, Dough Kneader and Gas Stove), four dehusker-cum-shellers with engines, and eight power weeders were distributed to FPOs and village panchayats to strengthen Custom Hiring Centres promote rural entrepreneurship, and enhance access to mechanization and post-harvest services.

Table 5.5:Centre-wise, season-wise SCSP FLD conducted in maize

Centre	FLD (ha)	Yield under FLD (q/ha)	Yield under FP (q/ha)	Yield gain	No. of Beneficiaries
Rabi 2024-25					
PJTAU, Karimnagar	35	90.99	80.46	13.09	87
BCKV, Kalyani, West Bengal	20	50	rice fallow	-	100
Total/mean (Rabi 2024-25)	**55**	**90.99**	**80.46**	**13.09**	**187**
Spring 2025					
GBPUAT, Pantnagar	15	84.65	rice fallow	-	48
ICAR-IIMR, Ludhiana	125	68.34	62.3	9.70	315
Total/mean (Spring 2025)	**140**	**68.34**	**62.3**	**9.70**	**363**
Kharif 2025					
CCS HAU, Karnal	7	62.0	48.0	29.2	17
CAU, Imphal	45	35.0	25.0	40.0	48
MPKV, Kolhapur	20	34.3	29.8	15.1	50
ZARS, JNKVV, Chhindwara	18	42.7	31.3	36.4	23
BCKV, Kalyani	20	70.0	-	-	100
Total/ average (Kharif 2025)	**110**	**48.8**	**33.5**	**45.6**	**238**

Table 5.6: Details of training programme conducted under SCSP

S. No.	Centre	Date	Location (Village, Block, District)	Type	Programme Title	Beneficiaries	Female
1	BHU Varanasi	19-09-2025	Ballia, UP	A	Farmers training	100	32
2	BHU Varanasi	22-11-2025	Ballia, UP	A	Farmers training	100	31
3	CAU, Imphal	07.03.2025	Imphal, Imphal West, Manipur	ID	Input Distribution Programme under SCSP (AICRP on Maize)	29	10
4	BCKV, Kalyani	12.06.2025	Susunia, WB	T, ID	Maize can replace upland rainfed rice	50	50
5	BCKV, Kalyani	21.08.2025	Bankura, WB	T, ID	Maize can replace upland rainfed rice	50	50
6	MPKV, Kolhapur	08.03.2025	Alve, Panhala, Kolhapur	T, ID, A, FD	Opportunities for farm women in maize cultivation	62	62
7	MPKV, Kolhapur	17.03.2025	Kisrul, Panhala, Kolhapur	A, FD	Constraints in maize cultivation	31	12
8	MPKV, Kolhapur	03.07.2025	Kognoli, Kavathemahankal, Sangli	T, ID, A, FD	Improved production technology of maize	50	7
9	MPKV, Kolhapur	03.07.2025	Ranjani, Kavathemahankal, Sangli	T, ID, A, FD	Improved production technology of maize	50	10
10	MPKV, Kolhapur	29.12.2025	Andur, Gaganbawda, Kolhapur	T, ID	Farm women training on post-harvest maize technology	23	23
11	PJTSAU, Karimnagar	29.08.2025	Palem, Bijinepalli, Nagarkurnool	T, FD, ID	Good agricultural practices in maize (Rabi)	25	8
12	GBPUAT, Pantnagar	14.02.2025	Gandhi Nagar, U. S. Nagar	T, ID	Cultivation practices of spring maize	47	3
13	GBPUAT, Pantnagar	15.05.2025	Vanusha, U. S. Nagar	T, ID	Pest Management in spring maize	25	2
14	ANGRAU, Peddapuram	07.01.2026	Yarnagudem, Devarapalli, East Godavari	T	Improved maize management practices	40	4
15	ANGRAU, Peddapuram	07.01.2026	Yarnagudem, Devarapalli, East Godavari	ID	Distribution of chemicals	25	0
16	ANGRAU, Peddapuram	10.02.2026	Gokavaram, Gokavaram, East Godavari	ID	Distribution of sprayers	25	3
17	PJTAU, Karimnagar	02.05.2025	Kathlapur, Kathlapur, Jagtial	T, ID, FD	Zero tillage maize and good agricultural practices	62	9
18	ZARS, JNKVV, Chhindwara, MP	24.06.2025	Dugariya, Amarwara, Chhindwara	ID	Hybrid maize with recommended fertilizer dose	23	4
19	Maize Research Station, Vagarai	26.03.2025	Vagarai, Theni	T	Maize production and FAW management	50	15
20	ICAR-IIMR, Ludhiana	07.07.2025	Lapra & Bilaspur, Ludhiana	T, ID	Improved maize management practices	200	90

21	ICAR-IIMR, Ludhiana	04-05.03.2025	RMR & SPC (ICAR-IIMR) Begusarai.	T, ID	Improve Seed Production Techniques for Training & Field visit of IARI, Jharkhand under SCSP Project.	29	18
22	ICAR-IIMR, Ludhiana	02.09.2025	Jagraon, Ludhiana	T, ID	Improved maize management practices	40	9
23	ICAR-IIMR, Ludhiana	19.11. 2025	ICAR-IIMR, Ludhiana	T, ID	Promotion of farm mechanization	76	30
24	ICAR-IIMR, Ludhiana	10.12. 2025	ICAR-IIMR, Ludhiana	T, ID	Promotion of farm mechanization	30	0
25	ICAR-IIMR, Ludhiana	14.10. 2025	ICAR-IIMR, Ludhiana	T, ID	Promotion of farm mechanization	62	34
26	ICAR-IIMR, Ludhiana	4.09.2025	Nurpur bet, Ludhiana	T, ID	Improved maize management practices	21	0
27	ICAR-IIMR, Ludhiana	4.09.2025	Chahar, Ladowal	T, ID	Improved maize management practices	26	0
28	ICAR-IIMR, Ludhiana	23.12.2025	ICAR-IIMR, Ludhiana	T, ID	Improved maize management practices	20	0
29	HAREC, Bajaura	31.12.2025	Palsehar, Bachhar	A	Farmers training	25	10
30	TNAU, Tamilnadu	26.03.2025	Aanakkanpatti,Ayakudi, KotturAvaramopatti	A	Maize production technologies and management of FAW	50	18
31	ARS, Karimnaganr	30-09-2025	ARS, Karimnaganr	P	Weed Management in zero tillage for maize production	62	24
32	RMP & SP, Begusrai	04 to 05.03. 2025; 28.04.2025 & 18.09.2025	Hazari Bagh, Jharkhand ; RMP & SP, Begusrai	IP	Improved maize management practices	60	23
			Total			1568	621

T-Training; ID-Input Distribution; FD-Field Days; A-Awareness

Table 5.7: Majors Inputs distributed under SCSP

S. No.	**Item**	**Unit**	**Quantity Distributed**
Particulars	Unit	Quantity	
Maize & Other Crop Seeds (Finger Millet)	tonnes	6.1	775
Fertilizers (DAP + MOP)	tonnes	10	100
Herbicides (Atrazine, Atrawill, Herbicide, Tembotrione & Topramezone)	Units	649	649
Plant Protection Inputs (Phule Micronutrients, Delegate, Plant Protection Chemical, Zinc Phosphide & Spinetoram)	Units	756	756
Sprayers (Knapsack + Battery-operated)	Nos.	727	727
Farm Implements & Equipment (Spades, Tarpaulin, Khurpi, Bucket, Manual Tiller, Power Weeder, Hand-operated Maize Sheller)	Nos.	878	878
Food Processing Equipment (Industrial Oven, Sealing Machine, Weighing Balance, Dough Kneader, Gas Stove, Dehusker-cum-Sheller with Engine)	Nos.	6	250
Power Weeder	Nos.	**8**	**900**
Dehusker-cum-Sheller with Engine	Nos.	**8**	**1000**

Input distribution by Pantnagar centre

Inputs distribution by Vagarai centre

Hybrid maize promotion among SC women by ICAR-IIMR

Training programme for farmers by Karimnager centre

Maize sheller distribution by IIMR, Ludhiana

Input distribution by IIMR, Ludhiana

Promotion of Maize in North Eastern Hill Region under NEH component

Under the North Eastern Hill (NEH) programme, Front Line Demonstrations (FLDs) on improved maize production technologies were conducted on 352.4 ha during Rabi 2024–25, Spring 2025 and Kharif 2025, benefiting 1,019 farmers across the region. During Rabi 2024–25, FLDs were conducted on 75 ha covering 188 farmers. The demonstrations recorded an average grain yield of 53.27 q/ha compared to 38.61 q/ha under farmers' practices, resulting in an average yield gain of 37.97%. The highest yield advantage was recorded at MTTC&VTC, CAU (I), Nafra (40.80%), followed by AAU, Gossaigaon (36.45%). During Spring 2025, FLDs were organized on 36 ha benefiting 40 farmers. Demonstrations at MTTC&VTC, CAU (I), Nafra and CAU, Imphal recorded yield gains of 34.55% and 54.63%, respectively, highlighting the potential of improved maize technologies under spring cultivation.

During Kharif 2025, FLDs covered 241.4 ha and benefited 791 farmers. The demonstrations recorded an average grain yield of 38.48 q/ha against 29.67 q/ha under farmers' practices, resulting in an average yield gain of 29.67%. The highest yield advantage was recorded at CAU, Imphal (62.47%), followed by IARI, Assam (39.88%), MTTC&VTC, CAU (I), Nafra (34.27%), AICRP on Maize, CAU, Meghalaya (22.63%) and AAU, Gossaigaon (21.82%).

To strengthen farmers' knowledge and skills, 32 training-cum-input distribution programmes, field days and awareness programmes were organized, benefiting 2,678 participants, including 1,349 women farmers. Besides these, 2379 rural households also benefitted from input distribution programmes (Table 5.10).

Table 5.8:Centre-wise NEH FLD conducted in maize

Centre	FLD (ha)	Yield under FLD (q/ha)	Yield under FP (q/ha)	Yield gain (%)	Beneficiaries
Rabi 2024–25					
AAU, Gossaigaon	30	68.50	50.20	36.45	83
MTTC&VTC, CAU (I), Nafra	45	38.03	27.01	40.80	105
Total/ average	75	53.27	38.61	37.97	188
Spring 2025					
MTTC&VTC, CAU (I), Nafra	6	35.01	26.02	34.55	5
CAU, Imphal	30	205.50	132.90	54.63	35
Total/ average	36	35.01	26.02	34.55	40
Kharif 2025					
AICRP on Maize, CAU, Meghalaya	147.4	16.80	13.70	22.63	607
AAU, Gossaigaon	50	55.50	45.56	21.82	84
IARI, Assam	20	45.21	32.32	39.88	70
MTTC&VTC, CAU (I), Nafra	4	36.40	27.11	34.27	10
CAU, Imphal	20	209.10	128.70	62.47	20
Total/ average	241.4	38.48	29.67	29.67	791

Table 5.9: Details of training programme conducted under NEH

S. No.	Centre	Date	Location (Village, Block, District)	Type	Programme Title	Beneficiaries	Female
1	CAU, Imphal, Kyrdemkulai	29.01.2025	Kyrdemkulai, Ri-Bhoi, Meghalaya	T, ID	Cultivation of specialty corn & FAW management	54	36
2	CAU, Imphal, Kyrdemkulai	30.01.2025	Kyrdemkulai, Ri-Bhoi, Meghalaya	T, ID	Cultivation of specialty corn & FAW management	69	55
3	CAU, Imphal, Kyrdemkulai	15.02.2025	Kyrdemkulai, Ri-Bhoi, Meghalaya	T, ID	Cultivation of specialty corn & FAW management	100	84
4	CAU, Imphal, Kyrdemkulai	20.02.2025	Kyrdemkulai, Ri-Bhoi, Meghalaya	T, ID	Cultivation of specialty corn & FAW management	60	47
5	CAU, Imphal, Kyrdemkulai	17.04.2025	Kyrdemkulai, Ri-Bhoi, Meghalaya	T, ID	Cultivation of specialty corn & FAW management	145	103
6	CAU, Imphal, Kyrdemkulai	22.04.2025	Nongsder, Ri-Bhoi, Meghalaya	T, ID	Cultivation of specialty corn & FAW management	12	10
7	CAU, Imphal, Kyrdemkulai	06.06.2025	Umiarong, Ri-Bhoi, Meghalaya	T, ID	Cultivation of specialty corn & FAW management	36	31
8	CAU, Imphal, Kyrdemkulai	01.07.2025	Kyrdemkulai, Ri-Bhoi, Meghalaya	T, ID	Cultivation of specialty corn & FAW management	29	24

9	CAU, Imphal, Kyrdemkulai	18.07.2025	Kyrdemkulai, Ri-Bhoi, Meghalaya	T, ID	Cultivation of specialty corn & FAW management	30	19
10	CAU, Imphal,Kyrdem-kulai	02.08.2025	Kyrdemkulai, Ri-Bhoi, Meghalaya	T, ID	Cultivation of specialty corn & FAW management	36	26
11	CAU, Imphal,Kyrdem-kulai	11.10.2025	Kyrdemkulai, Ri-Bhoi, Meghalaya	T, ID	Cultivation of specialty corn & FAW management	33	11
12	CAU, Imphal,Kyrdem-kulai	17–19.11.2025	Kyrdemkulai, Ri-Bhoi, Meghalaya	ID	CAU Regional Agri-Fair 2025	500	230
13	AAU, Gossaiga-on	26.02.2025	Hawriapet, Ko-chugaon, Kokra-jhar	T	Scientific cultivation of maize	25	17
14	AAU, Gossaiga-on	27.02.2025	Dompara, Manik-pur, Bongaigaon	T	Scientific cultivation of maize	26	5
15	AAU, Gossaiga-on	04.03.2025	Kakiladanga, Hatidura, Dhubri	T	Scientific cultivation of maize	25	5
16	AAU, Gossaiga-on	25.03.2025	Burichatam, Ko-chugaon, Kokra-jhar	FD	Field day on maize	51	25
17	AAU, Gossaiga-on	27.03.2025	Borbila, Manik-pur, Bongaigaon	FD	Field day on maize	50	14
18	AAU, Gossaiga-on	29.03.2025	Kakiladanga, Hatidura, Dhubri	FD	Field day on maize	50	1
19	IARI, Assam	26.02.2025	Bordoloni, Bag-inadi, Dirpai	A, ID	Awareness and input distri-bution for scientific maize cultivation 300	114	
20	CAU, Imphal	11–12.02.2025	Imphal, Imphal West, Manipur	T	Scientific cultivation of maize	130	53
21	CAU, Imphal	02.05.2025	Heinoubok, Bish-nupur, Manipur	FD	Maize field day	106	37
22	CAU, Imphal	28.05.2025	Andro, Imphal East, Manipur	T	Scientific maize cultivation under rainfed conditions	50	36
23	CAU, Imphal	05.06.2025	Nongbrum, Imphal East, Manipur	T	Scientific maize cultivation under rainfed conditions	50	31
24	CAU, Imphal	06.06.2025	Keirak, Kakching, Manipur	T	Scientific maize cultivation under rainfed conditions	50	34
25	CAU, Imphal	09.10.2025	Leimaram, Bish-nupur, Manipur	FD	Maize field day	57	28

26	MTTC&VTC, CAU (I), Nafra	22.02.2025	Pasighat, East Siang, Arunachal Pradesh	T, ID	Good agricultural practices in maize cultivation	60	35
27	MTTC&VTC, CAU (I), Nafra	25.02.2022	Pasighat, East Siang, Arunachal Pradesh	ID	Input distribution	20	11
28	MTTC&VTC, CAU (I), Nafra	04.03.2025	Koronu, Lower Dibang Valley, Arunachal Pradesh	T, ID	Scientific cultivation of specialty corn	30	14
29	MTTC&VTC, CAU (I), Nafra	17.03.2025	Pasighat, East Siang, Arunachal Pradesh	T	Scientific cultivation of hybrid maize	30	16
30	MTTC&VTC, CAU (I), Nafra	28.03.2024	Pasighat, East Siang, Arunachal Pradesh	T, ID	Scientific cultivation of hybrid maize	50	32
31	MTTC&VTC, CAU (I), Nafra	18.04.2025	Tawang, Tawang, Arunachal Pradesh	ID	Input distribution	20	25
32	MTTC&VTC, CAU (I), Nafra	18.09.2025	Not specified	ID, A	Awareness on scientific maize cultivation	120	80
Total						2404	1289

Table 5.10: Majors Inputs distributed under NEH

Particulars	Unit	Quantity	Beneficiaries
Maize Seed	Tonnes	5.49	1,712
Fertilizers (Urea, DAP, MOP & SSP)	Tonnes	18.93	232
Plant Protection Inputs (Herbicides, Insecticides, Bio-pesticides & Bio-fertilizers)	kg	≈6.12	1,334
Farm Implements & Small Equipment	No.	3,149	2,379
Information & Extension Materials	No.	901	901

Enhancement of maize production in catchment areas of ethanol industries

To promote sustainable maize production and strengthen the feedstock supply chain for ethanol industries, 3,227 Front Line Demonstrations (FLDs) were conducted across major maize-growing states during Rabi 2024–25, Spring 2025, and Kharif 2025 (Table 11). The demonstrations showcased improved maize hybrids, scientific crop management practices and improved cropping system to enhance productivity and profitability in the catchment areas of ethanol industries.

During Rabi 2024–25, FLDs benefited 803 farmers. The demonstrations recorded an average grain yield of 73.47 q/ha, compared with 60.93 q/acre under farmers' practices, resulting in an average yield gain of 22.19%. The highest yield advantage was recorded in Tamil Nadu (50.39%), followed by West Bengal (47.35%) and Rajasthan (28.78%).

During Spring 2025, FLDs covered 875 farmers and achieved an average grain yield of 87.31 q/acre, compared with 73.86 q/ha under farmers' practices, resulting in an average yield gain of 18.48%. The highest yield gain was observed in Uttarakhand (24.30%), followed by West Bengal (21.73%) and Rajasthan (20.75%).

During Kharif 2025, FLDs benefited 1,549 farmers. The demonstrations recorded an average grain yield of 51.93 q/ha, compared with 42.82 q/ha under farmers' practices, registering an average yield gain of 22.62%. The highest yield advantage was observed in West Bengal (48.30%), followed by Odisha (36.99%), Madhya Pradesh (28.67%), and Maharashtra (28.29%), demonstrating the effectiveness of improved maize production technologies across diverse agro-climatic regions.

To complement the demonstration activities, 262 extension programmes were organized during January–December 2025, comprising 132 awareness programmes, 84 training programmes, and 46 field days (Table 12). These programmes benefited 9,244 farmers and other stakeholders, including 4,581 participants in awareness programmes, 2,513 in training programmes, and 2,150 in field days. The interventions significantly improved awareness and adoption of improved maize production technologies, contributing to increased maize production in the catchment areas of ethanol industries.

Table 5.11. State-wise, season-wise maize demonstration performance

State	Demo Yield (Q/ha)	Non-demo Yield (Q/ha)	Yield Gain (%)	No. of Beneficiaries/ FLDs
Rabi 2024–25				
Assam	98.61	91.8	7.42	115
Andhra Pradesh	79.2	71.2	11.24	103
Madhya Pradesh	66.07	58.75	12.46	96
Rajasthan	63.1	49	28.78	49
Maharashtra	65.38	61.23	6.78	125
Odisha	63.87	55.68	14.71	40
Telangana	69.74	60.25	15.75	75
Uttar Pradesh	66.89	52.68	26.99	48
West Bengal	74.08	50.28	47.35	102
Tamil Nadu	87.79	58.38	50.39	50
Average/total (Rabi 2024–25)	**73.47**	**60.93**	**22.19**	**803**
Spring 2025				
Haryana	91.57	80.12	14.29	120
Rajasthan	62.55	51.8	20.75	18
Punjab	91.56	81.2	12.76	335
Uttar Pradesh	91.15	77.88	17.05	381
Uttarakhand	88.25	71	24.3	14
West Bengal	98.75	81.13	21.73	7
Average/total (Spring 2025)	**87.31**	**73.86**	**18.48**	**875**
***Kharif* 2025**				
Assam	40.91	33.46	22.27	40
Andhra Pradesh	50.22	42.4	18.44	110
Haryana	60.25	53.69	12.22	105
Madhya Pradesh	58.8	45.7	28.67	177
Rajasthan	45.17	37.64	20.01	165
Odisha	44.63	32.58	36.99	80
Maharashtra	54.81	42.73	28.29	265
Punjab	54.25	49.8	8.94	237
Telangana	62.25	58	7.33	68
Uttarakhand	48.92	42.31	15.62	2
Uttar Pradesh	46.83	37.65	24.38	220
West Bengal	56.13	37.85	48.3	80
Average/total (Kharif 2025)	**51.93**	**42.82**	**22.62**	**1,549**

Table 5.12. Capacity development programme under the project

Program	Number of Program	Number of farmers' Participation
Awareness Campaign	132	4,581
Training Program	84	2,513
Field Day	46	2,150
Total	262	9,244

FLDs of Improve management practices

Awareness campaign among farmers

Upscaling maize-based silage value chain in Punjab and Haryana

The project on **"Upscaling Maize-Based Silage Value Chain in Punjab and Haryana"** made significant progress during the year 2025 towards strengthening sustainable fodder production systems and improving livestock productivity in North-West India. The project focused on dissemination of improved maize hybrids and scientific silage-making technologies, establishment of efficient supply chains, and enhancement of farmers' socio-economic conditions through adoption of modern fodder management practices.

During Spring 2025, 104 acres were covered in Punjab and Haryana districts with an average yield of 206 quintals per hectare. Further, in Kharif 2025, 148 acres of FLDs were organized across six clusters, achieving yields ranging from 160 to 180 quintals per acre under favorable conditions. These demonstrations emphasized improved hybrids and scientific silage-making practices, although in some areas yield performance was affected by excessive rainfall and flooding.

Systematic evaluation of maize hybrids for silage suitability was undertaken during the period. During Spring 2025, 62 hybrids were assessed, followed by evaluation of 98 hybrids in Kharif 2025. In addition, nearly 240 experimental hybrids, including leafy maize types, were evaluated during Kharif 2025. One promising leafy hybrid recorded a grain yield of 8.5 t ha^{-1} along with a fodder yield of about 400 quintals ha^{-1}, indicating strong potential for dual-purpose use. Biochemical and quality analyses of selected hybrids are being carried out to identify superior genotypes for silage production.

In 2025, six major training-cum-field-day programmes were conducted across Punjab and Haryana, benefiting 621 farmers. These programmes focused on improved maize production practices, silage preparation methods, resource management, and profitability enhancement. In addition, a one-day workshop on strengthening the maize-based silage value chain was organized in October 2025, which provided a platform for interaction among farmers, FPO members, and stakeholders.

To enhance outreach and technology dissemination, informative leaflets and folders on maize silage production were developed and distributed in Hindi, English, and Punjabi. These materials covered critical aspects such as crop selection, harvesting stage, chaffing, compaction, and storage techniques, ensuring wider accessibility and improved adoption of scientific silage practices. A project success story highlighting the impact of maize silage in transforming livestock feeding systems in North-West India was published on the ICAR website in November 2025, and an impact video was produced to showcase field-level adoption and benefits of silage technology. Two silage units were established at Kunjpura, Karnal, Haryana and Sahdra, SBS Nagar, Punjab. A success story on "Maize silage revolution : IIMR's Breakthrough inititiative transform livestock in North-West, India" published on ICAR website.


Established silage units


Workshop on strengthening the maize-based silage value chain

Farmers' Training cum Field days

S. No.	Locations	No. participants	Date	Organized by
1.	Ambala	100	25-08-2025	Drs. Pardeep Kumar, Romen Sharma & BS Jat
2.	SBS Nagar (Nawanshahr)	110	18-09-2025	Drs. Pardeep Kumar, Romen Sharma & BS Jat
3.	Karnal	100	19-09-2025	Drs. Pardeep Kumar, Romen Sharma & BS Jat
4.	Hoshiarpur	108	23-09-2025	Drs. Pardeep Kumar, Deep Mohan Mahala & BS Jat
5.	Jalandhar	103	24-09-2025	Drs. Pardeep Kumar & BS Jat
6.	Jagroan (Ludhiana)	100	25-09-2025	Drs. Pardeep Kumar, Romen Sharma, Deep Mohan Mahala & BS Jat

Improving the livelihood and nutritional security through scientific maize cultivation and maize based entrepreneurship development in Koraput District, Odisha

Under the project "Improving the Livelihood and Nutritional Security through Scientific Maize Cultivation and Maize-Based Entrepreneurship Development in Koraput District, Odisha," ICAR–Indian Institute of Maize Research (ICAR-IIMR), Ludhiana implemented frontline demonstrations (FLDs), input distribution, and capacity-building programmes across six blocks of Koraput district—Koraput, Semiliguda, Pottangi, Laxmipur, Narayanpatna, and Dasmantpur.

During Rabi 2024–25, FLDs were conducted on 35 acres, covering 66 tribal farmers across 9 villages under the Mastiput, Maliput, Kutinga, and Borgi Gram Panchayats. Beneficiaries also received 40 Topramezone, and 80 Emamectin Benzoate, promoting the adoption of improved maize production technologies and scientific crop protection practices.

During Kharif 2025, demonstrations were expanded to 56.5 ha (140 acres), benefiting 377 tribal farmers. FLDs were conducted using both public- and private-sector maize hybrids (Kalingaraj, P3501, and P3350), and farmers were supplied with crop protection inputs, including Topramezone, Emamectin Benzoate, and Spinetoram, through input distribution programmes organized during 17–20 June 2025 to ensure timely sowing and effective crop management.

To strengthen farmers' knowledge and skills, four training and sensitization programmes on scientific maize cultivation, integrated pest management, and the safe use of pesticides were organized, benefiting 221 farmers.

Overall, the project significantly enhanced the adoption of improved maize production technologies, strengthened farmers' technical capacity, and contributed to improved productivity, livelihood, and nutritional security among tribal farming households in Koraput district.

Input distrbutions for FLDs

Provide Technical Support and Capacity Building of Farmers on Sustainable Agricultural Practices Related to Maize Cultivation in Project Blocks of Haryana and Punjab

The FAO-funded project, "Provide Technical Support and Capacity Building of Farmers on Sustainable Agricultural Practices Related to Maize Cultivation in Project Blocks of Haryana and Punjab," was implemented by the ICAR–Indian Institute of Maize Research (ICAR-IIMR), Ludhiana, to strengthen farmers' capacity in sustainable maize cultivation and promote climate-resilient agricultural practices across the districts of Karnal and Kaithal in Haryana and Patiala and Sangrur in Punjab. The project focused on enhancing farmers' knowledge, improving resource-use efficiency, and promoting crop diversification from water-intensive rice to maize.

A total of 34 farmer training programmes were organized across 12 project blocks and 34 villages, with 17 training programmes each in Haryana and Punjab. These programmes benefited 1,299 farmers, including 595 farmers in Haryana and 704 farmers in Punjab. The training covered improved maize production technologies, including quality hybrid seed, scientific crop establishment, balanced nutrient management, precision irrigation, integrated pest management, conservation agriculture, and other climate-smart practices. To strengthen experiential learning, 100 farmers from Haryana and Punjab participated in exposure visits to ICAR-IIMR and the Borlaug Institute for South Asia (BISA), Ludhiana, where they gained practical knowledge of advanced maize production technologies and sustainable farming systems. In addition, ICT-enabled advisory services were established through WhatsApp groups, providing regular weather forecasts, crop management advisories, nutrient scheduling recommendations, and pest surveillance alerts to more than 290 farmers throughout the cropping season.

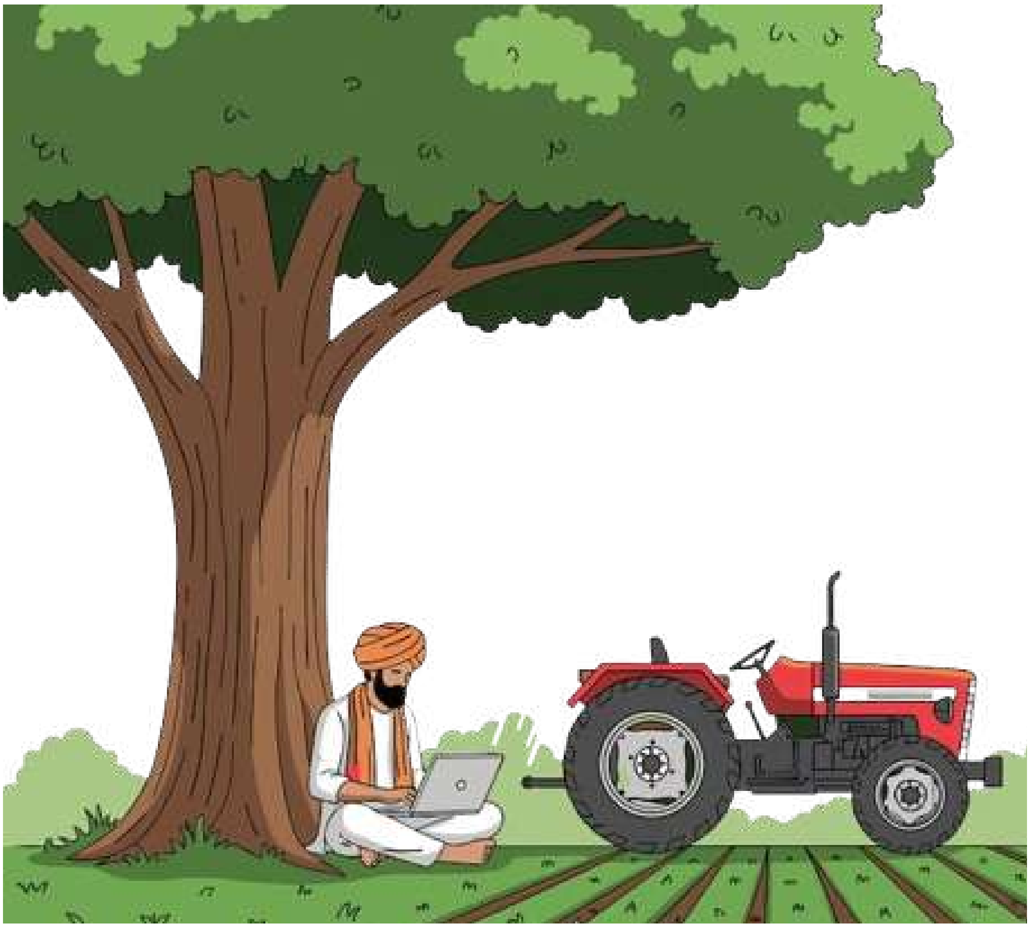
The project generated strong scientific evidence on the environmental and economic advantages of maize cultivation over conventional rice-based systems. Field assessments demonstrated that maize cultivation can reduce irrigation water use by 60–70%, lower production costs by 15–25%, and improve farm profitability by 20–30%. Maize-based production systems also substantially reduced greenhouse gas emissions, particularly methane emissions, while improving soil health and resource-use efficiency. These findings reinforce maize as a sustainable, climate-smart, and economically viable alternative to rice in the rice–wheat production systems of north-western India.

Training programme at Dinger Majra, Gharunda Block, Karnal, Haryana on 28th July, 2025.

Training programmes at Chanauli village, Dhuri Block, Sangrur, Punjab on 29th July, 2025.

Maize demonstration in Gharunda Block of Karnal, Haryana.

Exposure visit of the farmers from Haryana and Punjab at ICAR-IIMR, Ludhiana.



CHAPTER-6

AICRP ON MAIZE

Breeding Summary of AICRP kharif 2024

Field corn

During kharif 2024, a total of 405 (excluding check and filler entries) test entries were evaluated in different maturity groups, namely long, medium, early and stages (NIVT, AVT-I, and AVT-II) under AICRP. The test entries were in different trials depending on the agro-ecological zones, type of test entry, maturity group, and stage of testing. The total number of trials was 29 which includes NIVT (6), AVT-I (11), AVT-II (9), AVT-I and II (1), OPV (1), and Rainfed (1). The total number of entries evaluated in NIVT was 253 which includes early (47), medium (132), long (62) and OPV (12). Out of 253 entries, 69 (27.27%) entries were promoted to AVT-I. The 69 promoted entries comprise 6, 28, 28, and 7 entries of early, medium, long, and OPV with success rates of 12.76, 21.21, 45.16, and 58.33 per cent, respectively. The total number of entries evaluated in AVT-I were 55 which includes 10, 23, 20, and 2 entries of early, medium, long and OPV, respectively. Out of 55 entries, 20 (36.4%) were promoted to AVT-II which includes 3, 6, 10, and 1 entry of early, medium, long, and OPV with a success rate of 30.0, 26.1, 50.0, and 50.0, per cent, respectively. The total number of test entries with >10% (medium and early) and >5% (long) superiority over the best check entry across one or more than one zone in NIVT were 10, 14, 46, and 3 in early, medium, and long duration, and OPV, respectively. Similarly, 2, 5, 7, and 1 AVT-I entries were in early, medium, long duration, and OPV, respectively. The number of test entries which have completed three years of testing with >10% superiority over best check in early and medium across one or more than one zone was 2, whereas in long duration 12 entries were >5% superior over best check in one or the other zones.

QPM

The QPM trials were conducted in five agro-ecological zones namely NHZ, NWPZ, NEPZ, PZ, and CWZ. The number of trials conducted in NHZ was one, whereas, in the rest of the zones, three trials were conducted. The number of test entries evaluated in NHZ were 9, 3, 2, 7, and 2 under QPM- I, QPM-II EDV, QPM-III EDV, QPM-I IDV, and QPM-II IDV, respectively; however, the number of EDVs differed between different zones depending on the zone for which the initial variety (IV) has been released. The major traits for which the EDVs developed were provitamin A (proA), QPM, vitE, waxy1 (wx1), Fe, and Zn, high oil, methionine, and different combinations.

The number of biofortified EDV entries promoted in NHZ from AVT-I and AVT-II in different categories were 7, 1, 4, and 1 in QPM, proA+QPM+wx1, ProA+QPM, wx1, respectively. The number of QPM entries promoted from NIVT to AVT-I in NWPZ, NEPZ, PZ, and CWZ, were 13, 8, 9, and 12, respectively. Similarly, the number of QPM entries promoted from AVT-I to AVT-II in NWPZ and CWZ were 2 and 5, respectively. In NWPZ, the number of biofortified EDV entries promoted from NIVT to AVT-I in different categories namely, proA+QPM, Zn+QPM, proA+QPM, were 2, 1, and 1, respectively; similarly, the number of EDVs promoted from AVT-I to AVT-II in different categories namely, wx1, wx1+QPM, proA+QPM+Methionine, QPM+proA+high amylose, and QPM+proA+vitE+high oil was 1, 1, 1, 1, and 1, respectively. In NEPZ, the number of biofortified EDV entries promoted from NIVT to AVT-I in proA+QPM was 2; whereas from AVT-I to AVT-II, the number of entries promoted in different categories namely, proA+QPM, wx1, proA+QPM+methionine, QPM+proA+high amylose, QPM+proA+vitE+high oil and were 1, 1, 1, 1 and 1, respectively. In PZ, the number of biofortified EDV entries promoted from NIVT-AVT-I in different trait combinations namely, proA+QPM and QPM+Zn were 2 and 1, respectively; whereas from AVT-I to AVT-II, the number of entries promoted in different trait/gene combinations namely, wx1+QPM, proA+QPM+methionine, QPM+proA+high amylose, QPM+proA+vitE+high oil was 1, 1, 1, and 1, respectively. In CWZ, the number of biofortified EDV/IDV entries promoted from NIVT to AVT-I in different trait combinations namely, proA+QPM and QPM+Zn were 2 and 1, respectively; whereas from AVT-I to AVT-II, the number of entries promoted in different gene/trait combinations namely, wx1, wx1+QPM, proA+QPM+methionine, QPM+proA+high amylose, QPM+proA+vitE+high oil, QPM+proA+vitE+high oil, Zn (IDV) were 1, 1, 1, 1, 1, 1, and 1, respectively.

Specialty corn

During kharif 2024, the sweet corn trial of the rest of the zones (NWPZ, NEPZ, PZ, and CWZ) comprises 14 test entries which comprise 6, 5, and 3 entries in NIVT, AVT-I, and AVT-II, respectively; Out of 14 entries, one entry (16%) was promoted from NIVT to AVT-I and 4 (80%) entries were promoted from AVT-I to AVT-II. Sweet corn trial of NHZ comprises 6 entries which include 1, 2, and 3 entries of NIVT, AVT-I, and AVT-II, respectively and none of the entries were promoted to the next stage. The baby corn trial of the rest of the zone (WPZ, NEPZ, PZ, CWZ) comprises 10 test entries, which comprise of 5, 2, and 3 entries in NIVT, AVT-I, and AVT-II, respectively. Out of 10 entries, 4 entries (80%) were promoted from NIVT to AVT-I and 2 (100%) entries were promoted from AVT-I to AVT-II. The bay corn trial of NHZ comprises 3 NIVT and 2 AVT-II entries. Out of 3 NIVT entries one entry (33%) was promoted to AVT-I.

Breeding Summary of AICRP Rabi 2024-25 trials

During Rabi 2024-25, a total of 142 entries were received for multi-location evaluation in AICRP late, medium maturity of normal corn and quality protein maize (QPM), Sweet Corn, Baby Corn, Popcorn trails. Of 142 test entries, total 96 entries were received in NIVT trials -NIVT late (36) and NIVT medium (60); total 10 entries were evaluated in AVT I trials- AVT-I late (07), AVT-I medium (03); there were five (05) entries for testing in AVT II trials-AVT-II late (04), AVT-II medium (01);six (05) entries were received for QPM trial; In Baby corn trial there were six (06) entries; Sweet corn trial had one (01) entries; Popcorn trial had nineteen (19) entries, for evaluation. Out of the total 142entries, 55 were contributed by the Private sector (18 different firms) and the rest (87) came from 32 centres of AICRP on maize. Total of twelve different breeding trials was constituted, viz., NIVT late, NIVT medium, AVT-I late, AVT-I medium, AVT-II late, AVT-II medium, QPM, Sweet Corn, Baby Corn, Popcorn, Medium starch, and late starch trails, were constituted across the zones. One hundred thirty-five (135) entries were to be promoted from the first and second year of testing.

Table 6.1: Total trials constituted in Rabi, 2024-25

Discipline	No. of entries
Breeding	12
Pathology	3
Entomology	3
Total	18

Table 6.2: Details of the breeding trials constituted during Rabi 2024-25

Trial Name	No. of entries
NIVT	2
AVT	4
QPM	1
Baby corn	1
Sweetcorn	1
Popcorn	1
Starch	2
Total	12

Table 6.3: Details of the number of entries evaluated during Rabi 2024-25

Trial Name	No. of entries
NIVT	96
AVT I	10
AVT II	5
QPM	5
Babycorn	6
Sweetcorn	1
Popcorn	19
Total	142

Breeding Summary of AICRP Kharif 2025 trials

During Kharif 2025, a total of 404 entries were received for multi-location evaluation in AICRP short, medium and long maturity of normal corn and quality protein maize (QPM), Sweet Corn, Baby Corn trials, Popcorn, OPV, Rainfed and High Fe/Zn trials. Of 404 test entries, total 234 entries were received in NIVT trials -NIVT long (74), NIVT medium (120) and NIVT short (40); total 45 entries were evaluated in AVT I trials- AVT-I long (14), AVT-I medium (21), and AVT -1 short (10); there were twenty five (16) entries for testing in AVT II trials- AVT-II long (08), AVT-II medium (04), AVT-II short (04); sixty-eight

(68) entries were received for QPM trial; In Baby corn trial there were 10 entries; Sweet corn trial had (07) entries; Popcorn trial had only one (01) entry, 23 entries were OPV.

A total of forty-nine different breeding trials were constituted, one set of trials exclusively for Zone I, i.e. the Northern Hill Zone, and the other for the rest of the zones

NHZ: Total fourteen trials,viz. NIVT medium, NIVT short, AVT-I-II medium, AVT-II short, QPM 1st, QPM 2nd, QPM 3rd, Baby Corn I-II-III and Popcorn I-II-III, OPV, starch, Rainfed, QPM (Quality), and High Zn trials

Rest of the Zones: Total of thirty-seven trials viz. NIVT long, NIVT medium-1,NIVT medium-2, NIVT short,AVT- I short, AVT-I medium, AVT-I long, AVT-II short,AVT-IImedium, AVT-II long, QPM 1st, QPM 2nd, QPM 3rd , Sweet Corn I-II-III, Baby Corn I-II-III, QPM (Quality), Rainfed, Waterlogging, Starch short, Starch Medium and long, High Fe/Zn trails were constituted across the zones.

Zone-specific trials

NWPZ (5): AVT-I short, AVT-I medium, AVT-IImedium, QPM II, QPM III

NEPZ (8): AVT-I short, AVT-II short,AVT-I medium, AVT-II medium, AVT-I long, AVT-II long, QPM II, QPM III

PZ (5): QPM II, QPM III, AVT-I, II medium, AVT- I long, AVT- II long

CWZ (7): QPM II, QPM III, AVT- I short, AVT- II short,AVT-I medium, AVT- I long, AVT- II long.

The total number of trials constituted, details of the breeding trials constituted, details of the number of entries evaluated during kharif 2025 are given in Table 6.4, Table 6.5 and Table 6.6, respectively.

Table 6.4: Total trials constituted in Kharif 2025

Discipline	No.
Breeding	49
Pathology	8
Entomology	4
Nematology	1
Total	**62**

Table 6.5: Details of the breeding trials constituted during Kharif 2025

Trial Name	No. of trials
NIVT (Short/Medium/Long duration NHZ (3) and rest of the zones (3)	6
Advanced Varietal Trials I & II (Zone-wise Short/Medium/Long duration)	19
Quality Protein Maize (QPM)	12
Baby corn	2
Sweetcorn	1
Open Pollinated Variety	1
Popcorn	1
Rainfed	2
Waterlogging	1
Starch	2
Quality	1
High Fe/Zn	1
Total	49

Table 6.6: Details of the number of entries evaluated during Kharif 2025 –Trial-wise

Trial Name	No. of entries
NIVT	234
AVT I	45
AVT II	16
QPM	68
Baby corn	10
Sweetcorn	07
Popcorn	01
OPV	23
Total	404

Plant Pathology

Kharif 2024

During *Kharif* 2024, AICRP Plant Pathology trials on maize were conducted in five zones, *viz.*, NHZ (Northern Hill Zone), NWPZ (North West Plain Zone), NEPZ (North East Plain Zone), PZ (Peninsular Zone) and CWZ (Central Western Zone), against major diseases prevalent in those regions. A total of 108 entries of short and medium maturity were screened in the NHZ zone, while 359 entries of short, medium and long maturity groups were evaluated under artificial epiphytotic conditions in the NWPZ, NEPZ, PZ and CWZ zones across different trials under the AICRP on maize against major diseases prevalent in these regions. In NHZ, entries in NIVT, AVT and QPM were evaluated against Turcicum leaf blight (TLB); entries in sweet corn (SC), baby corn (BC) and popcorn (PC) trials against TLB, BLSB (Banded leaf and sheath blight) and BSR (Bacterial stalk rot). Similarly, in the rest of the zones, different entries were tested against their respective major diseases, *viz*., MLB (Maydis leaf blight), BLSB, ChR (Charcoal rot) and BSR in NWPZ; MLB and BLSB in NEPZ; TLB, BLSB, ChR and SDM (Sorghum downy mildew) in PZ; and FSR (*Fusarium* stalk rot) in CWZ. The promising resistant entries from different maturity groups and trials in different zones are listed in Table 6.7.

Table 6.7. Summarized list of resistant entries/genotypes in different zones during *Kharif* 2024

Zone	Maturity group	Trials	Disease	Resistant entry
NHZ	Short	NIVT	TLB	AMH 2022-141, DH 380, DH 381, FDH 93, FH 4236, FMH 66, IMH 10-24K-6-E, JH 32984, KGH 23-17, LMH 2438
		AVT I	TLB	AHD 1639
		AVT II	TLB	IX 7851
	Medium	NIVT	TLB	AH 4142, AMH 2022-161, BMH C-57-18, DH 383, HKH 417, IMH 10-24K-3, IMH 10-24K-4, IMH 10-24K-8, IMH 10-24K-9, IMH 2-24K-107, IMH 2-24K-112, IMH 2-24K-3, IY 8291 (DKC 9274), IY 8323 (DKC 9273), IY 8384, KDMH 140, LMH 1324, LMH 6524, MAH 19-2, MAH 22-55, MAH 22-79
		AVT I	TLB	IX 8455 (DKC 9254), IX 8466 (DKC 9256)
	Specialty corn	QPM I	TLB	APH 9, FBH 105, FBH 106, IMH 10-K24wx2, IQPMH 2402, IQPMH 2403, IQPMH 2405, IQPMH 2406, IQPMH 2407, IQPMH 2408
		QPM II	TLB	APH 7
		QPM III	TLB	FMH 24
		OPV I	TLB	ADC 9, APC 12, CAU-LMC-3, DOP 351, JC 1520, JC 1526, SKMC 5
		OPV II	TLB	APC 10, PFM 12
		SC II	BLSB	CP SWEET KING
		SC III	BLSB	APTSKH1
		BC I	BLSB	IBH 11-246
		BC III	BLSB	JH 32484
NWPZ	Medium	NIVT	MLB	BH 418203
	Long	NIVT	ChR	CT 1171, PMH 8447, VNR 4344
			BSR	PM 24110

NEPZ	Medium	NIVT	MLB	BRM 21-5
		AVT II	BLSB	BH 417189, IW 8477 (9243C), JH 20088, JKMH 4823
	Long	NIVT	MLB	PM 24104
			BLSB	3469 (IU), ADV 7570, AH 4734, AH 4739, AH 4743, AH 4754, BRM 21-6, GH 22568, GH 23276, JH 23015, KMH 24-2, PH 421343, PM 24104, PM 24107, PM 24108, PM 24109, PM 24111, PM 24114, PM 24116, SMH 1971, SMSX22366, SRMH 7677, SYN 243703L, SYN 244802L, VNR 4344, VNR 4352
		AVT I	BLSB	ADV 7405, BH 418103, GH 20113, HARLAL 1001, PM 23112, PM 23115, PM 23116, SRIKAR AADI, VNR 32583
		AVT II	BLSB	HARLAL 24, HM 22201, IQ 8701 (9222C), PM 22117, SRMH 999, SYN 221610 L, VNR 4324
	Specialty corn	QPM I	BLSB	AZH 1, AZH 2, IQPMH 2402, IQPMH 2408, QQPMH 1981
		QPM II	BLSB	APH 8, IMH 10-282W-1, IMH 10-292W-3, IQPMH 2311
		QPM III	BLSB	APQWH 8, IQPMH 2203
		SC I	BLSB	FSCH 290
		SC III	BLSB	ISH 6-2104
		BC I	BLSB	MBC 23-44
PZ	Short	NIVT	ChR	AH 4735, FSMH 2024-1, AH 4732, AHD 2006, AHD 2009, KMH 8115
		AVT I	ChR	CP 418
		AVT II	ChR	SMH 9099
	Medium	NIVT	ChR	AH 4733, BMH 0084, HARLAL 414, IM 36507, IMH 10-24K-119, IMH 9-241, IY 8384, NAOMI 9091
		AVT II	ChR	IW 8477 (9243C)
	Long	NIVT	TLB	BIO 046, BIO 057, PM 24109
			ChR	NS 8018
		AVT I	TLB	ADV 7454, GH 20113
			ChR	SRIKAR 3699
		AVT II	TLB	KMH 8388
	Specialty corn	QPM I	ChR	APH 9, IQPMH 2404, IQPMH 2408
		QPM II	ChR	APTQOH 5, IMH 10-12A
		SC II	ChR	CP SWEET KING, ISH 6-2101
CWZ	Short	NIVT	FSR	AH 4746, AMH 2022-141, BMH I-51-11, DH 380
		AVT I	FSR	AHD 2035
	Medium	NIVT	FSR	ADV 7536, GH 23213, IMH 9-241, NAOMI 9091, OMH 24-2, RCRMH 24, SMH 0073
		AVT I	FSR	GH 22336
	Specialty corn	QPM II	FSR	APH 8, IMH 10-282W-4
		SC III	FSR	FSCH 131

Disease management trials *Kharif* 2024

A multi-location assessment of fungicide formulations at Udaipur, Pantnagar, Dharwad and Mandya against major maize diseases prevalent in those regions demonstrated the efficacy of strobilurine-triazole formulations. Foliar application of azoxystrobin 18.2% + cyproconazole 7.3% SC (0.20%) on the 3rd and 18th days post-inoculation showed maximum efficacy against Maydis leaf blight (MLB), Rajasthan downy mildew (RDM) and Curvularia leaf spot (CLS). Trifloxystrobin 25% + tebuconazole 50% WG (200 g/ha) showed high efficacy against Banded leaf and sheath blight (BLSB). Similarly, azoxystrobin 18.2% + difenoconazole 11.4% SC (0.10%) was more effective against Turcicum leaf blight (TLB), Polysora rust and Common rust, whereas fluopyram 21.37% + trifloxystrobin 21.37% SC (0.20%) showed maximum efficacy against *Fusarium* stalk rot (FSR). For Charcoal rot (ChR), azoxystrobin 18.2% + difenoconazole 11.4% SC (0.10%) applied at 30-45 DAS considerably reduced disease severity at the Ludhiana and Delhi centres. Biological control of maize cyst nematode (*Heterodera zeae*) using enriched vermicompost with *Metarhizium anisopliae* (5 q/ha) significantly reduced nematode populations and increased grain yield in Pratap Makka-5.

Rabi 2024-25/Spring-2025

During *Rabi* 2024-25, AICRP Plant Pathology trials on maize were conducted in three zones, *viz*., NEPZ (North East Plain Zone), PZ (Peninsular Zone) and CWZ (Central Western Zone), against major diseases prevalent in these regions. A total of 142 entries of long and medium maturity were screened across all three zones in different trials under AICRP on maize. In the NEPZ, PZ, and CWZ, entries were evaluated for resistance to maize diseases, including Maydis leaf blight (MLB) and Turcicum leaf blight (TLB) in NEPZ, Charcoal rot (ChR) and *Fusarium* stalk rot (FSR) in PZ, and FSR in CWZ, under artificial epiphytotic conditions. The promising resistant entries from different maturity groups and trials in different zones are listed in Table 6.8. During Spring 2025, AICRP Plant Pathology trials on maize were conducted in two zones, namely the NWPZ (North West Plain Zone) and the PZ (Peninsular Zone), against ChR disease prevalent in those regions. A total of 52 entries across short, medium and long-maturity categories were screened in the aforementioned zones under artificial epiphytotic conditions. Of 52 entries, only two representative entries, namely DH 389 and JH 24090, from the medium-maturity group exhibited resistance to ChR disease in the NIVT trial in the NWPZ zone.

Table 6.8. Summarized list of resistant entries/genotypes in different zones during *Rabi* 2024-25.

Zones	Maturity group	Trials	Disease	Resistant entry
NEPZ	Long	NIVT	MLB	ADV 7134, BRM 23R-180, MMH 24-14, PM 24207L
			TLB	54M45
		AVT II	MLB	PM 22203L
	Medium	NIVT	MLB	CORNTECH 1012, DKC 9270 (IZ8711), JH 21020, PA 6666
			TLB	CORNTECH 1012, DKC 9270 (IZ8711)
		AVT I	MLB	DKC 9225 (IY 8533)
			TLB	DKC 9225 (IY 8533)
	Specialty corn	QPM I	MLB	IMH-10-24Rwx1
		BC I	MLB	IBH 9-249
		BC II	MLB	AHD 2754
CWZ	Long	NIVT	FSR	54M45, ADV 7134, BH 419505, BH 420105, BH 420205, KMH 24-6, MMH 24-11, PM 24202L, PM 24203L
		AVT I	FSR	ADV 7394, PM 23204L, PM 23202L, PM 23207L
		AVT II	FSR	ADV 7126, DM 9445
	Medium	NIVT	FSR	AMH 2023-21, BH 418103, BMH-I-51-11, BRM 23R-162, BRM 23R-70, CORNTECH 2737, DKC 8268 (IZ 8212), DKC 9265 (IZ 58299), GH 22583, GH 23113, KMH 24-5, MMH 24-16, PH 420009, PH 421266, SYN 247899, WH 1047
		AVT I	FSR	AHD 2100
		AVT II	FSR	BS 652

Entomology

Kharif 2024

The Maize AICRP Entomology *Kharif* 2024 experimental trials are primarily aimed at resistance screening for spotted stem borer (SSB) [*Chilo partellus* (Swinhoe)] and fall armyworm (FAW) [*Spodoptera frugiperda* (J. E. Smith)] at hotspot locations. Post-screening, genotypes were categorized as resistant, moderately resistant, or susceptible based on leaf injury rating (LIR) on a 1-9 scale (Resistant 1.0-3.0, Moderately resistant >3.1-6.0 and Susceptible >6.1-9.0) for stem borers. During *Kharif* 2024, a total of 135 entries, comprising four AICRP trials in short (13), medium (31), and long (33) maturity groups, OPV (6), Sweet corn (10), baby corn (5) and QPM (37), were evaluated against spotted stem borer *Chilo partellus* (Swinhoe) and fall armyworm (FAW) under artificial infestation. None of the entries were found resistant to both pests. Population dynamics of FAW and *Helicoverpa armigera* were monitored across different AICRP locations. The efficacy of various insecticides as foliar sprays, ITK practices, and non-chemical methods was evaluated for FAW management. Spraying chlorantraniliprole 18.5% SC @ 0.4 mL, spinetoram 11.7% w/w SC @ 0.5 mL/L, isocycloseram 18.1% w/w SC @ 0.6 mL/L or broflanilide 20 SC @ 0.25 mL/L of water showed the most effective control against FAW. Among the ITK practices evaluated, the most effective treatments against FAW were soil + insecticide (chlorantraniliprole 18.5% SC) and bait + chlorantraniliprole 18.5% SC. Maize intercropped with cowpea and EPN spray at 20 and 40 DAS recorded the lowest per cent plant infestation compared with the untreated control.

Management of fall armyworm

During *Kharif* 2025, maize AICRP entries (AVT I and II) were evaluated for SSB and FAW under artificial infestations at different AICRP locations. Monitoring of *Helicoverpa armigera* through pheromone traps was done. Various newer insecticide molecules, foliar sprays, and non-chemical methods were evaluated for the management of FAW. Studies on pest succession, incidence and estimation of yield losses were also conducted at different locations.

Rabi 2024-25/Spring-2025

The Maize AICRP Entomology *Rabi* 2024-25 and Spring 2025 experimental trials primarily aim to screen for pink stem borer (PSB) [*Sesamia inferens* Walker], spotted stem borer (SSB) [*Chilo partellus* (Swinhoe)], fall armyworm (FAW) [*Spodoptera frugiperda* (J. E. Smith)] and shoot fly [*Atherigona* sp.] at hotspot locations to identify resistant entries against these insect pests. Post-screening, genotypes are categorized as resistant, moderately resistant and susceptible based on LIR of 1-9 scale (Resistant 1.0-3.0, Moderately resistant >3.1-6.0 and Susceptible >6.1-9.0) for stem borers. For shoot fly, genotypes were categorized based on the mean per cent dead hearts (DH) as resistant <10% DH, moderately resistant >10-30% DH, moderately susceptible >30-50% DH, susceptible >50-70% DH and highly susceptible >70% DH (Sharma et al., 1992). A total of 38 maize entries across different maturity groups and specialty corn were screened for resistance to PSB and SSB at Hyderabad and Kolhapur, respectively, and none of the entries were found to be resistant to both pests. Out of 38 maize entries of different maturity groups and specialty corn, none of the entries were found resistant to FAW. A total of 16 and 6 maize entries from the medium-maturity and short-duration groups were screened for resistance to shoot fly, and none were found to be resistant.

Management of fall armyworm

Field experiments to evaluate insecticides and non-chemical methods for FAW management were conducted at various AICRP locations during the *Rabi* 2024-2025 season. All newly evaluated insecticides were effective against FAW. Among the non-chemical methods evaluated, maize intercropped with cowpea and EPN spray at 20 and 40 DAS were effective against FAW.

CHAPTER-7

SIGNIFICANT EVENTS

IMPORTANT EVENTS

Republic Day Celebrations

ICAR-Indian Institute of Maize Research, Ludhiana, proudly celebrated the 76th Republic Day on 26th January 2025 with the ceremonial hoisting of the national flag, honoring the occasion with great respect and patriotism. The event served as a heartfelt tribute to the ideals enshrined in the Constitution and to the countless contributions that have shaped the nation's journey of progress and resilience. On this significant day, the institute community reflected on India's achievements while reaffirming its unwavering commitment to excellence in agricultural research, innovation, and farmer-centric development. The celebration underscored the institute's continued dedication to strengthening food security and fostering a sustainable future for the nation.

Foundation Day Celebrations

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, celebrated its 11th Foundation Day on 9th February 2025 with the participation of eminent scientists, policymakers, and stakeholders. Dr. Satbir Singh Gosal, Vice Chancellor, Punjab Agricultural University, graced the occasion, while Dr. Sain Dass, former Director of ICAR-IIMR, delivered the Foundation Day Lecture. Dr. R.K. Singh, ADG (Agricultural Extension), Dr. Nachiket Kotwaliwale, Director, ICAR-CIPHET, and Dr. Yadvinder Singh, eminent soil scientist, attended as Guests of Honour. The Director, ICAR-IIMR, presented the institute's key achievements over the past year, including the development of high-yielding maize hybrids, ICAR-certified technologies, quality publications, expanded presence on the Sathi Portal, large-scale extension activities, and commercialization of hybrids with over 35 MSMEs. Dr. Jat highlighted the identification of IMH229/DMRH1410 for ethanol production, offering 5% higher recovery than existing hybrids, and emphasized strengthening seed production ecologies for timely availability of quality seed. Dr. Gosal underscored maize's growing importance in food, feed, fuel, and nutritional security, appreciating the institute's research excellence and role in crop diversification in Punjab. Dr. R.K. Singh stressed stronger coordination for effective hybrid availability to farmers. Dr. Sain Dass highlighted the potential of single cross hybrids and India's prospects as a hub for hybrid seed production. Dr. Kotwaliwale emphasized collaborative research in mechanization and post-harvest management, while Dr. Yadvinder Singh advocated conservation agriculture for sustainable maize production. Farmers were recognized for promoting maize adoption and value addition, and institute staff were honoured for their achievements. The programme concluded with a formal vote of thanks.

Winter School on "Climate-Smart maize Agriculture for Food and Energy Security in India"

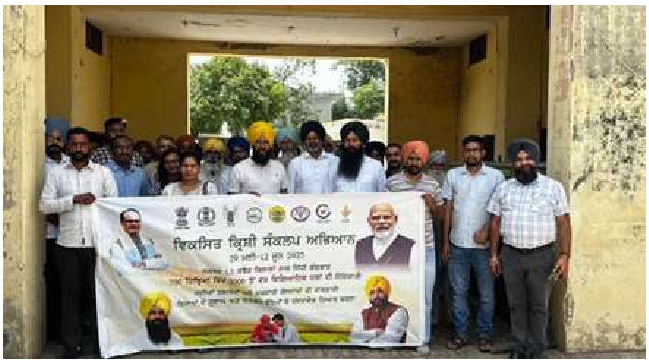
ICAR-Indian Institute of Maize Research, Ludhiana, in collaboration with ICAR-Central Institute of Post-Harvest Engineering and Technology, Ludhiana, inaugurated the ICAR-sponsored winter School on "Climate-Smart Maize Agriculture for Food and Energy Security in India" on 5th March, 2025. The programme is being conducted from 5-25th March, 2025 at ICAR-IIMR and ICAR-CIPHET, Ludhiana. Dr. R. K. Yadav, Director, ICAR-Central Soil Salinity Research Institute, Karnal, graced the inaugural session as the Chief Guest. The Winter School aimed to strengthen the capacity of scientists and stakeholders through advanced training on climate-resilient maize production, sustainable resource management, and innovative approaches to enhancing food and energy security under changing climatic conditions.

Poshan Pakhwada Celebrations

As part of the Poshan Surakshya Abhiyan, ICAR-IIMR and its regional centres organized a series of awareness activities from 8th to 22nd April, 2025 to promote the 'Eat Right Movement' under the message of 'Nutrition First', particularly among young children. The programmes were conducted at Jharkhandi Anganwadi and Kids Play School, Begusarai, led by RMR & SPC Begusarai, and at Village Jonewal near Machhiwara, Ludhiana, led by ICAR-IIMR, Ludhiana. Through interactive sessions, fun-based learning activities and food-focused demonstrations, children and community members were sensitized to the importance of balanced diets and nutritious food choices. The initiatives encouraged active community participation and highlighted the role of maize and other nutritious foods in addressing malnutrition. These activities reinforced ICAR-IIMR's commitment to building a healthier, nutrition-conscious future generation.

Innovate, Inform, Inspire: ICAR's Outreach to Farmers under "Viksit Krishi Sankalp Abhiyan-2025"

Under the Government of India's "*Viksit Krishi Sankalp Abhiyan-2025*", ICAR-IIMR and ICAR-CIPHET jointly conducted a large-scale farmer outreach and awareness campaigns across Punjab from 29th May to 12th June 2025. Eleven expert teams engaged directly with farmers across 23 districts through village visits and farmer-scientist interactions, focusing on timely Kharif sowing, high-yielding varieties, balanced input use, improved post-harvest management, value addition, and awareness of government schemes. The initiative was flagged off at Fatehgarh Sahib by Shri Gurmeet Singh Khuddian, Hon'ble Agriculture Minister of Punjab, with participation from Dr. Satbir Singh Gosal, Dr. Pervender Sheoran, Dr. Nachiket Kotwaliwale, and Dr. H. S. Jat. Throughout the campaign, teams promoted climate-smart agriculture, demonstrated improved technologies, addressed field-level challenges, gathered farmer feedback, and documented grassroots innovations to support sustainable and resilient farming. The programme strengthened farmer–scientist partnerships, encouraged crop diversification, water conservation, and technology adoption, and facilitated the transfer of advanced research to farmers' fields.



Glimpses of VKSA activities organized by ICAR-IIMR, Ludhiana from 29th May to 12th June 2025

Training-cum-Workshop on “Maize-Based Bioethanol and Catchment Development”

A three-day training-cum-workshop on “Empowering Field Implementation for Maize-Based Bioethanol and Catchment Development” was held from 23-25th July 2025 at ICAR-IIMR, Ludhiana, under the project “Enhancement of Maize Production in the Catchment Area of Ethanol Industries.” The programme was inaugurated by Dr. H. S. Jat, Director, ICAR-IMR, who highlighted the importance of scientific approaches, high-yielding hybrids, and mechanization to boost maize productivity and support the Government of India’s target of 30% ethanol blending (E30) by 2030. Dr. S. L. Jat (PI of project) outlined the projects focus on ensuring a stable raw material supply for ethanol industries through improved maize production and stronger field coordination. With maize cultivated on nearly 12 million hectares and yielding about 3.5 tonnes per hectare, the crop is increasingly important for ethanol production, generating around 380 liters per tonne. The workshop brought together 27 field personnel from 78 districts across 15 states, providing a platform to share field experiences and strengthen efforts toward sustainable maize production aligned with the national ethanol mission.

Live Telecast of PM-KISAN 20th Instalment Release

Staff of ICAR-IIMR, Ludhiana, along with its regional centers-RMR & SPC, Begusarai; WNC, Hyderabad; and the Delhi Unit attended the live telecast of the Hon'ble Prime Minister Shri Narendra Modi releasing the 20th instalment of the PM-KISAN scheme from Varanasi on 2nd August 2025. The event witnessed participation from scientists, technical staff, and other stakeholders. Under the 20th instalment, financial assistance of ₹20,500 crore was disbursed to over 9.7 crore farmers through Direct Benefit Transfer (DBT). The initiative highlighted the government's continued commitment to ensuring transparency, timely support, and the elimination of intermediaries in delivering benefits to farmers. The programme reinforced awareness among participants about the importance of welfare schemes in strengthening farmers livelihoods and promoting inclusive agricultural growth.

Independence Day Celebrations

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana proudly celebrated the 79th Independence Day on 15th August 2025, with the hoisting of the national flag and rendition of patriotic songs, reflecting the spirit of unity and patriotism. The occasion provided an opportunity to remember the sacrifices of our freedom fighters and reaffirm our dedication to the ideals of the nation. Scientists and administrative staff collectively pledged their commitment to empowering farmers through innovation-driven maize research and sustainable agricultural development. The celebration reinforced the institute's resolve to contribute meaningfully towards a self-reliant and progressive India.

Parthenium Awareness Week

ICAR-Indian Institute of Maize Research, Ludhiana, observed *"Parthenium Awareness Week"* from 16th-22nd August 2025, with a strong focus on highlighting the ill-effects of the invasive weed *Parthenium hysterophorus* and promoting its effective management. The programme aimed to sensitize farmers, students and the general public about the serious threats posed by this weed to agriculture, biodiversity, human and animal health. Under this programme, various awareness activities, including interactive sessions and demonstrations were organized to encourage community participation. Emphasis was also laid on integrated weed management practices and the collective responsibility required to control the spread of *Parthenium* effectively.

Workshop on "Biotech Intervention in Maize: Challenges and Opportunities"

A workshop on "Biotech Intervention in Maize: Challenges and Opportunities" was held on 1st September 2025 at ICAR-IIMR, Ludhiana, in collaboration with Biotech Consortium India Limited (BCIL) and supported by the Federation of Seed Industry of India (FSII), bringing together scientists, policymakers, industry representatives and farmer groups to highlight the urgent need for biotechnology in enhancing maize productivity, climate resilience and farmer incomes. Despite being the world's 5th argest maize producer with nearly 42.3 million tons from over 12 million hectares, its average productivity remains below the global average, underscoring the need for innovations to meet rising demand from food, feed and ethanol sectors. Speakers emphasized the potential of drought-tolerant, pest-resistant and nutritionally enhanced varieties, integration of genetic engineering and genome editing with conventional breeding for yield gains and the importance of science-based policies, faster regulatory approvals and stronger partnerships. The event concluded with a consensus on promoting responsible biotechnology adoption to strengthen national food, feed and fuel security.

Swachhta Hi Seva Campaign 2025

The "Swachhta Hi Seva Campaign 2025" was organized by ICAR-IIMR, from 17th September to 2nd October 2025 across its campuses at Ludhiana, the Delhi Unit, WNC Hyderabad, and RMR & SPC Begusarai under the theme "Swachhotsav," highlighting the importance of cleanliness, hygiene, and collective responsibility. The campaign featured a series of cleanliness drives, awareness programmes, and participatory activities aimed at promoting a healthy and well-maintained work environment while sensitizing staff and stakeholders to sustainable sanitation practices and citizen-led initiatives. Special drives conducted in and around office premises led to noticeable improvements in sanitation and surroundings, with active participation fostering a strong sense of shared responsibility and reinforcing the importance of maintaining cleanliness as a regular practice.

Workshop on "Upscaling Maize-Based Silage Value Chain in Punjab and Haryana"

A workshop on "Strengthening the Maize-Based Silage Value Chain in Punjab and Haryana" under the project "Upscaling Maize-Based Silage Value Chain in Punjab and Haryana," funded by the Ministry of Agriculture and Farmers Welfare, Government of India, was organized by the ICAR-Indian Institute of Maize Research (IIMR), Ludhiana on 6th October, 2025. Delivering the keynote address, Dr. H. S. Jat, Director, ICAR-IIMR, emphasized the importance of silage maize in addressing India's green fodder deficit, noting its benefits for land-use efficiency, soil health and higher farmer returns, while improving livestock productivity. He also highlighted ongoing efforts to develop region-specific silage hybrids and farmer-centric value chain models. Experts discussed key aspects of silage production, including suitable hybrids, quality parameters, crop management, harvesting and ensiling techniques, storage systems and microbial inoculants. Deliberations also covered entrepreneurship development, custom-hiring services, seed planning, and stronger linkages with the livestock sector. Participants highlighted silage maize as a sustainable and climate-resilient alternative that ensures consistent feed quality, enhances milk yield, and supports animal health, while also creating opportunities for rural entrepreneurship through FPOs, dairy cooperatives, and agri-startups. The workshop concluded with a consensus on the need for capaci-

ty building, policy support, and large-scale demonstrations to accelerate silage adoption and strengthen crop–livestock integration. Representatives from NDDB, Milkfed, Punjab Agro Industries Corporation, PDFA, Verka, seed companies, FPOs and other stakeholders attended the event.

Live Telecast of Prime Minister's Launch of Major Agricultural Projects

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, organized a live telecast of the Hon'ble Prime Minister Shri Narendra Modi's address during the Special Krishi Programme held at Pusa, New Delhi, on 11th October 2025, marking the nationwide launch "PM Dhan Dhaanya Krishi Yojana" and the "Mission for Aatmanirbharta in Pulse", with an outlay of over ₹42,000 crore, reaffirming the Government of India's strong commitment to sustainable agriculture and farmer empowerment. The event witnessed participation of over 358 farmers, scientists and extension personnel's. During the event, Dr. H. S. Jat, Director, ICAR-IIMR, Ludhiana, emphasized the awareness of government schemes, adoption of improved technologies and crop diversification, highlighting the escalating opportunities in maize driven by ethanol and feed demand.

Inauguration of New Administrative-cum--Laboratory Building of ICAR-IIMR, Ludhiana

The newly constructed Administrative-cum-Laboratory Building of ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, was inaugurated on 14th October by the Union Minister of Agriculture, Farmers' Welfare and Rural Development, Shri Shivraj Singh Chouhan, in the presence of Shri Bhagirath Choudhary (Union Minister of State for Agriculture and Farmers' Welfare), Shri Ravneet Singh Bittu (Union Minister of State for Railways), Shri Gurmeet Singh Khuddian (Punjab Agriculture Minister), and Dr. M. L. Jat (Secretary (DARE) & Director General (ICAR)), along with several dignitaries. A National Stakeholder Consultation Meeting with over 1000 participants was also organized to deliberate on strategies for enhancing maize productivity and farmers income. The state-of-the-art Administrative-cum-Laboratory Building constructed at a total cost of ₹37.56 crore, will support advanced research in genomics, biotechnology, agribusiness promotion, crop diversification, mechanization, and digital agriculture. Addressing the gathering, Shri Chouhan highlighted maize's expanding role in food, feed, industrial, and bioenergy security, which has significantly increased farmers' income and reduced crude oil imports, transforming farmers from *Annadata* to *Indhanadata*. Minister of State Shri Bhagirath Choudhary underscored efforts to develop maize as an all-season, pan-India crop for sustainable and stable farm incomes. Dr. M. L. Jat underscored ICAR's role in crop diversification, mechanization, conservation agriculture and emerging innovations such as maize-based biopolymers for environmental sustainability. Dr. H. S. Jat (Director, ICAR-IIMR), highlighted the institute's achievements, including development of over 45 high-yielding hybrids, 24 biofortified varieties, large-scale seed production and promotion of maize-based livelihoods through

FPOs, SHGs, and MSMEs across 78 districts in 15 states. The programme also featured field demonstrations on crop residue management, exposure visits to a bee enterprise, and a Farmers' Choupal that facilitated direct interaction among farmers, scientists, and industry representatives. The event concluded with a renewed commitment to strengthening maize-based agricultural transformation and enhancing farmer prosperity.

Vigilance Awareness Week 2025

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, and its Regional Centers observed Vigilance Awareness Week 2025 from 27th October to 2nd November 2025, with great zeal and commitment. As part of the observance, officers, scientists, and staff members participated in the Integrity Pledge, reaffirming their dedication to uphold honesty, transparency and accountability in all official and personal endeavors.

Workshop on "Sustainable Rice Residue Management in Punjab"

A one-day workshop on "Sustainable Rice Residue Management in Punjab" was jointly organized on 28th October 2025 at ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, in collaboration with ICAR-Central Institute of Post-Harvest Engineering and Technology (CIPHET), and International Maize and Wheat Improvement Centre (CIMMYT), bringing together around 100 participants to discuss environmentally sustainable and economically viable solutions to curb rice residue burning. Dr. H. S. Jat, Director, ICAR-IIMR, highlighted the importance of crop diversification and effective residue management for soil health, while Dr. N. Kotwaliwale, Director, ICAR-CIPHET, emphasized coordinated efforts among stakeholders for practical solutions. Experts from PAU and ICAR-ATARI discussed advancements in residue management technologies, soil health benefits and KVK-led initiatives to reduce stubble burning. CIMMYT specialists conducted live demonstrations of advanced machinery and in-situ decomposition techniques, providing practical insights into scalable solutions. The workshop concluded with a collective call for collaborative action among research institutions, industry, and policymakers to promote sustainable residue management practices for cleaner air, healthier soils, and resilient agro-ecosystems in Punjab.

Rashtriya Ekta Diwas Celebrations

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, celebrated "Rashtriya Ekta Diwas (National Unity Day)" with enthusiasm to commemorate the 150th birth anniversary of Sardar Vallabhbhai Patel on 31st October 2025. On the occasion, Dr. H. S. Jat, Director, ICAR-IIMR, highlighted Sardar Patel's pivotal role in uniting the nation and emphasized the values of unity, integrity and collective responsibility. The celebration featured various

activities like "Run for Unity" the administration of the "Unity Pledge" and various competitions, with active participation from scientists and staff. The programme reinforced the institute's commitment to national integration and the spirit of patriotism.

Janjatiya Gaurav Diwas Pakhwada Celebrations

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, commemorated the 150th birth anniversary of Bhagwan Birsa Munda by observing "Janjatiya Gaurav Diwas Pakhwada" from 1-15th November, 2025. Recognized as a valiant freedom fighter and social reformer, Birsa Munda remains a symbol of tribal pride and resistance against colonial rule. The observance highlighted his legacy, inspiring courage, justice and cultural pride, while honoring the contributions and resilience of India's tribal communities.

Commemorating 150 years of Vande Mataram

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, joined the nation in commemorating 150 years of "Vande Mataram" on 7th November 2025, the iconic national song that inspired India's freedom movement and continues to evoke a deep sense of unity, courage, and devotion to the motherland. The occasion was observed with pride and reverence, reaffirming the institute community's commitment to the values of patriotism, collective responsibility, and nation-building.

Release of 21st Installment of PM-KISAN

ICAR- Indian Institute of Maize Research (IIMR), Ludhiana, organized a live webcast of the Hon'ble Prime Minister's address on 19th November 2025, during which the 21st installment of the PM-KISAN Scheme was released. The event was attended by scientists, staff and stakeholders who collectively witnessed this important initiative supporting farmers nationwide. The Prime Minister highlighted the Government's continued commitment to farmer welfare and agricultural development, while participants appreciated the positive impact of such schemes on strengthening the agricultural sector. The programme concluded with an interactive session reflecting on the significance of sustained policy support for inclusive and resilient growth in agriculture.

Indian Constitution Day Celebrations

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana celebrated Indian Constitution Day on 26th November 2025 with great enthusiasm and solemnity. On this occasion, staff members collectively read the Preamble of the Constitution and reaffirmed their commitment to its core values and principles. The programme highlighted the importance of justice, liberty, equality and fraternity in strengthening democratic institutions. Participants were also sensitized to their constitutional duties and the role of public institutions in upholding the spirit of the Constitution in everyday professional and civic life.

Swachhta Pakhwada

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, organized the "Swachhta Pakhwada" from 16-31st December 2025, during which the Swachhta Pledge was administered to officers, scientists, technical staff, and employees, who actively participated in various activities and reaffirmed their collective commitment to cleanliness, hygiene and maintaining a clean, healthy, and sustainable work environment.

Kisan Divas Programme

On the occasion of Kisan Divas, ICAR-IIMR, Ludhiana and its regional centres organized a nationwide online programme on 23rd December 2025 through the Zoom platform, where 109 farmers attended and listened to the addresses of the Hon'ble Union Minister for Agriculture and Farmers Welfare, Shri Shivraj Singh Chauhan Ji, and the Hon'ble Minister of State, Shri Bhagirath Chaudhary Ji. Farmers were briefed on key rural employment initiatives, including the revamped MGNREGA under the Viksit Bharat-Guarantee for Rozgar and Ajeevika Mission (Gramin) Act, 2025, which provides 125 days of guaranteed employment per household, focusing on durable asset creation, rural infrastructure, water security, climate resilience, digital governance and decentralized planning. The programme emphasized policy reforms for strengthening rural livelihoods and sustainable development. Dr. H. S. Jat, Director, ICAR-IIMR and Dr. N. Sunil, In-charge (AICRP-Maize), along with senior officials and staff participated in the event.

SIGNING OF MoU'S FOR RESEARCH COLLABORATIONS

MoU with Sworn Agritech Private Limited, Jabalpur

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, signed a Memorandum of Understanding (MoU) with Sworn Agritech Private Limited, Jabalpur on 12th February 2025 for the production and marketing of the maize hybrid "DMRH 1308". The collaboration aimed to enhance the availability of quality hybridv seed, leading to increased maize productivity and higher corn production for the benefit of farmers and end users. The initiative is also expected to contribute to the Indian economy by strengthening maize-based industries, particularly through increased ethanol production.

MoU with Krishi Vikas Sahakari Samiti Ltd, Rajasthan

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, signed a Memorandum of Understanding (MoU) with Krishi Vikas Sahakari Samiti Ltd., Rajasthan, on 31st March 2025 for the production and marketing of the maize hybrid "IMH 224". This initiative will enhance the supply of quality hybrid seed to improve maize productivity and corn production, benefiting farmers and end users and contributing to economic growth through expanded ethanol production.

MoU with Precision Grow for AI-Enabled Smart Maize Farming

ICAR-Indian Institute of Maize Research (ICAR-IIMR) has signed a Memorandum of Understanding (MoU) with Precision Grow, a company specializing in AI-powered smart farming solutions on 2nd July 2025. The collaboration aimed to integrate artificial intelligence, weather stations and satellite imagery to enhance maize cultivation through precision irrigation, real-time crop monitoring and data-driven advisory services. The initiative is expected to improve resource-use efficiency, optimize crop management and support informed decision-making for farmers.

MoU with Bharatiya Beej Sahakari Samiti Limited

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, signed two Memoranda of Understanding (MoU) with Bharatiya Beej Sahakari Samiti Limited (BBSSL) on 15th July 2025 for the seed production and marketing of two promising maize hybrids *viz.,* DMRH 1308 and DMRH 1301. The collaboration aimed to promote large-scale adoption of these high-yielding hybrids at farmers fields, enhance maize productivity and system profitability and ensure increased maize availability for key industries such as starch, feed and ethanol.

MoU with Ashoka Seed Pvt. Ltd

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, has signed a strategic Memorandum of Understanding (MoU) with Ashoka Seed Pvt. Ltd. for the production and commercialization of two promising maize hybrids *viz.,* DMRH 1308 and LQMH1 on 26th July 2025. The collaboration aimed to ensure the availability of quality hybrid maize seed at affordable prices, strengthen India's feed and bioenergy sectors and advance the vision of Atmanirbhar Krishi. Supported by the Ministry of Agriculture & Farmers' Welfare, ICAR, Agri Innovate and the Ministry of Petroleum & Natural Gas. The partnership is expected to make a significant contribution to sustainable agriculture and clean energy initiatives.

MoU with SHUNYA Fodder and Forage Pvt. Ltd.

ICAR–-Indian Institute of Maize Research (IIMR), Ludhiana, has signed a Memorandum of Understanding (MoU) with SHUNYA Fodder and Forage Pvt. Ltd. on 31st July 2025, to conduct research on hydroponic maize green fodder production. The collaboration aimed to promote sustainable, nutrient-rich fodder cultivation, enhancing livestock productivity and supporting efficient, climate-resilient farming practices.

MoU with Star Agriseeds Pvt Ltd, Rajasthan

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, signed a Memorandum of Understanding (MoU) with Star Agriseeds Pvt. Ltd., Rajasthan on 31st July 2025 for the production and marketing of the maize hybrid DMRH 1308. The collaboration aimed to enhance the availability of quality hybrid seed, leading to higher maize productivity and increased corn production for the benefit of farmers and end users.

Agreement with Basudha Seeds Ltd., West Bengal

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, signed an agreement with Basudha Seeds Ltd., West Bengal, on 25th November 2025 for the large-scale seed production of its promising maize hybrid IMH 229 (DMRH 1410), a high-yielding, medium-duration variety, that offers superior grain yield, good silage quality and enhanced starch content, making it well-suited to diverse farming systems and feed requirements. This collaboration aimed to enhance the availability of quality seed for farmers, strengthen the maize value chain, support the national ethanol programme and boost overall agricultural productivity.

IMPORTANT MEETINGS

National Symposium on Hybrid Technology for Enhancing Crop Productivity (NSHT)

Dr. H. S. Jat, Director, ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, delivered an invited lecture titled "India's Maize Improvement Program: Challenges, Progress, and Roadmap" at the National Symposium on Hybrid Technology for Enhancing Crop Productivity (NSHT), held at the National Agricultural Science Centre (NASC), New Delhi, from 8-10th January 2025. In his lecture, he highlighted the current status of maize improvement in India, key technological advancements and emerging challenges in hybrid development. He also outlined strategic priorities and future roadmaps for strengthening maize productivity, resilience and farmer profitability through hybrid technology.

1st International Farming Systems Conference-2025

Dr. H. S. Jat, Director of ICAR-IIMR, delivered a lead lecture on "Sustainable Intensification of Maize-Based Farming Systems for Enhancing Resilience and Profitability in Smallholders" on 8th March, 2025, during the 1st International Farming Systems Conference-2025. The conference, themed "Transforming Food, Land, and Water Systems under Global Climate Change," was held from 7-9th March, 2025, at ICAR-Indian Institute of Farming Systems Research (IIFSR), Modipuram, Meerut, Uttar Pradesh, India.

Meeting for Strengthening Maize Ecosystem

A meeting was held on 4th July 2025 at the Agriculture Directorate, Lucknow, to discuss strengthening the maize ecosystem in Uttar Pradesh, under the chairmanship of Shri Ravindra Kumar, Principal Secretary, Agriculture, Government of Uttar Pradesh. Dr. H.S. Jat, Director, ICAR-IIMR, and Dr. Mahesh Gathala, CIMMYT India Head, presented a roadmap and strategy for collaborative action by the State Department of Agriculture, State Agricultural Universities (SAUs), and CIMMYT. The discussions focused on the development of the entire maize value chain in the presence of the Director of Agriculture, MD of Seed Corporation, Vice-Chancellors of SAUs, CIMMYT-India representatives, and scientists from ICAR, SAUs, and CIMMYT. The meeting marks a crucial step toward enhancing maize production to meet the rising demand for ethanol while promoting farmers' prosperity in the state.

IRC Meeting to Review the Progress of Ongoing Projects

An IRC meeting has been conducted from 17-18th July 2025 under the chairmanship of Dr. H. S. Jat, Director, ICAR-IIMR, Ludhiana, to review the progress of various ongoing research projects. The Principal investigators of various projects presented updates on key milestones, challenges and outcomes, followed by detailed discussions to streamline implementation and enhance projects efficiency. Emphasis was placed on strengthening collaboration, ensuring timely deliverables, and aligning research activities with institutional priorities. The meeting was concluded with strategic recommendations to accelerate innovation and maximize the impact of maize research for farmers and stakeholders.

Strengthening AICRP-Maize through Advanced Technologies and Skill Development

A three-day training programme for scientific and technical staff of the All India Coordinated Research Project (AICRP) on Maize was organized by ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, from 11-13th August, 2025, with participants from agricultural universities and research centers across India Dr. H.S. Jat, Director, IIMR was course Director, and the training was coordinated by Drs. Sunil Neelam, SL Jat and Abhijit Das. The training was mainly focused on AICRP trial management, data recording and uploading, germplasm development, hybrid seed production, experimental designs, agronomic and crop protection practices, conservation agriculture and mechanized sowing. Participants were also exposed to new-age technologies such as drones, pneumatic planters and mechanized field operations, while emphasizing the importance of outreach for yield realization. Concluding the programme, Dr. Jat underscored the critical role of advanced technologies in enabling farmers to meet the rising maize demand driven by the ethanol sector.

UPDA International Summit-2025

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, actively participated in the "UPDA International Summit 2025", held on 5th September 2025 at Hotel Radisson Blu, Noida. This summit organized by the Uttar Pradesh Distillers Association (UPDA), which brought together policymakers, industry leaders, researchers and other key stakeholders to deliberate on biofuels, technological innovations and the expanding role of maize in ethanol production. On this occasion, Dr. H. S. Jat, Director, ICAR-IIMR, highlighted the critical contribution of maize in achieving India's ethanol blending targets, while ensuring sustainable and environmentally responsible energy security. He emphasized the importance of research-led innovations, improved maize hybrids, and efficient production systems in strengthening the maize-ethanol ecosystem. ICAR-IIMR also showcased its latest technologies and research advancements, underlining their potential to enhance productivity, profitability and resilience across the maize-ethanol value chain.

Research Advisory Committee Meeting

ICAR-IIMR, Ludhiana organized its Research Advisory Committee (RAC) on 11-12th September 2025, meeting under the chairmanship of Dr. S.S. Gosal, Vice-Chancellor of PAU, Ludhiana with six official other members, including a farmers representative, to review the institute's research progress and plan future directions. The committee appreciated the significant work carried out by ICAR-IIMR, Ludhiana, during the past year. During 2024-25, a total of 27 maize hybrids were released among which 4 were from IIMR. Total 13 MoU's were signed with private seed companies/MSMEs for five IIMR Hybrids. Additionally, five maize hybrids from ICAR-IIMR were registered with PPV&FRA. Notably, IIMR hybrids have consistently received the highest breeder seed indents from DAC, over the last four years. Among the promising hybrids, IMH 222, IMH 223 and LQMH 1 were identified as better options during spring, while IMH 231 was recommended for kharif season. Further, ICAR–IIMR is advancing climate-resilient maize by developing stress-tolerant, high-starch hybrids with improved pest and disease resistance, while promoting innovative agronomic practices and using advanced tools such as genome editing, AI and agri-drones to support sustainable production. The committee recommended continued emphasis on multi-stress-tolerant, high-yielding hybrids with enhanced starch content and stronger market linkages to meet the growing demand for maize.

11th Edition of SugarTech 2025

During the 11th Edition of "SugarTech 2025", a key session on "*Biofuels: What's Next*" was chaired by Dr. H. S. Jat, Director, ICAR-Indian Institute of Maize Research (ICAR-IIMR), Ludhiana. The event was organized by the Confederation of Indian Industry (CII), Uttar Pradesh, which was held on 26th September 2025, at Hotel Taj Mahal, Lucknow. The conference, themed "Innovating Sugar & Bioenergy: Towards a Green, Resilient & Self-Reliant Bharat," highlighted the vital contribution of the sugar and bioenergy sectors to India's clean energy transition, rural economic growth and sustainable development goals.

Meeting with Secretary General (AARDO)

Dr. H. S. Jat, Director, ICAR-IIMR, along with the institute's scientific team, met Dr. Manoj Nardeo Singh, Secretary General of the "African-Asian Rural Development Organization (AARDO)", on 16th October 2025, to discuss leveraging maize for transforming rural livelihoods in African-Asian nations. The meeting was productive, and both parties expressed enthusiasm to collaborate on maize research, capacity building and value chain strengthening.

Advancing Maize Drying Technologies with Steamtech, Gujarat

On 16th October 2025, Dr. S.L. Jat and team met Mr. Shashwat Varia from Steamtech Innovative Machinery, Gujarat, a pioneer in maize and multi-commodity drying plants. They discussed innovative drying technologies and explored potential collaboration opportunities to improve maize processing and post-harvest management. The meeting highlighted strategies to enhance efficiency and adoption of advanced post-harvest solutions.

Session on Regenerative Agriculture, Krushi Odisha

Dr. H. S. Jat, Director of ICAR-Indian Institute of Maize Research (ICAR-IIMR), Ludhiana, delivered an invited lecture on "Value Chain and Regenerative Agriculture" during a special session on regenerative agriculture, organized in collaboration with ICRISAT at Krushi Odisha on 10th November 2025 by the Department of Agriculture and Farmers Empowerment, Government of Odisha. In his talk, Dr. Jat highlighted the importance of integrated value chains, sustainable production systems and regenerative practices in enhancing farmer incomes while restoring soil health and ecosystem services. The session saw active participation from policymakers, scientists and other stakeholders, fostering meaningful dialogue on scaling regenerative agriculture for long-term agricultural sustainability.

6th International Agronomy Congress

The ICAR-Indian Institute of Maize Research (IIMR) team actively participated in the "Sixth International Agronomy Congress" held from 24-26th November 2025 at CSIR-National Physical Laboratory (NPL), New Delhi. The congress brought together national and international experts to deliberate on recent advances in agronomy, sustainable production systems and climate-resilient agriculture. The ICAR-IIMR team showcased the institute's key contributions and ongoing innovations in maize research aimed at enhancing productivity, resource-use efficiency and climate adaptability. The interactions provided valuable opportunities for knowledge exchange, networking and exploring future research collaborations to advance sustainable agronomic practices for food and nutritional security.

Viksit Krishi, Viksit Uttar Pradesh 2047 programme

During the "Viksit Krishi, Viksit Uttar Pradesh 2047" programme organized on 27th November 2025 by the Government of Uttar Pradesh at Indira Gandhi Pratishthan, Lucknow, Dr. H. S. Jat, Director, ICAR-

IIMR, Ludhiana, delivered a presentation on enhancing maize production in the state. Addressing senior officials, scientists and farmers, he emphasized the adoption of improved maize hybrids, mechanization and modern agronomic practices as key strategies to increase productivity and ensure higher, sustainable income for farmers.

International Conference on Millet-Maize DDGS-Ethanol

Dr. H. S. Jat, Director, ICAR-Indian Institute of Maize Research (IIMR), participated as a panellist in the 2nd Millet-Maize DDGS-Ethanol International Conference, held at Hotel Leela Ambience, Gurugram, during 15-16th December 2025. The panel discussion focused on key issues related to sustainable biofuel production, the role of maize in the ethanol blending programme and opportunities for strengthening maize-based value chains through research, innovation and industry collaboration were deliberated.

EXTENSION AND OUTREACH ACTIVITIES

Driving Maize Innovation: Awareness cum Field Day in Panchkula

ICAR-IIMR, Ludhiana, in collaboration with MG Petrochem Pvt. Ltd., KVK Panchkula, and the Department of Agriculture, organized an "Awareness Cum Field Day on Maize" on 28th January 2025, in Dandlawar village, Panchkula, with participation of 150 stakeholders. The event offered farmers direct interaction with experts, focusing on advanced maize farming techniques, sustainable practices, aflatoxin-free production for bioethanol and feed industries, zero tillage, and mechanized cultivation. Dr. S.L. Jat highlighted maize's role in income stability, energy security, and environmental sustainability under the government's ethanol-blending initiative, while other experts, including Dr. B.S. Jat and Dr. Romen Sharma from ICAR-IIMR, Ludhiana); Jai Prakash Sharma (SMS, KVK Panchkula); Dr. Gurnam Singh (Department of Agriculture); and Dr. Rajesh Lather (Department of Horticulture), shared valuable insights on pest management, soil health, nutrient management, and agronomic practices. They emphasized the role of maize in crop diversification as a pathway to environmental sustainability.

Empowering Farmers: Three-Day Master Training on Maize at Begusarai

A three-day residential master training was held at the Regional Maize Research and Seed Production Center, Begusarai, under ICAR-IIMR, Ludhiana, from 18-20th February, 2025, with 25 participants, including ATMA officials, BTMs, agricultural coordinators, and farmer advisors from Katihar, Purnea, Madhepura, Muzaffarpur and Khagaria. Sponsored by BAMETI, Government of Bihar, the programme was facilitated by Dr. Chikkappa G. Karzagi, Dr. P.L. Saujanya, Dr. Mukesh Chaudhary, Dr. Alok Kumar Sahu, Dr. Pradeep Kumar, Dr. Alla Singh, Dr. Ramesh Kumar and Ms. Sukhmani Dhaliwal, who provided expert guidance on maize cultivation, integrated farming, pest management, seed production, value addition, food processing and nutrition-focused maize-based products. The training included hands-on demonstrations of maize-based foods, mixed cropping, silage and fodder production, and field visits to Kusumahaut farm to showcase commercial maize farming. Participants received certificates and were encouraged to serve as master trainers in their respective blocks, spreading knowledge and enhancing farmer income.

Bio-Fortified Maize for Nutrition Security and Farmer Prosperity

ICAR–IIMR, Ludhiana, organized a training programme entitled "Bio-Fortified Maize: A Gateway to Nutrition and Economic Prosperity" on 25^{th} February 2025, at Khandoor, Ludhiana, under the DBT Biotech-Kisan project focused on popularizing bio-fortified maize hybrids in Himalayan states, Central India, and the North Eastern Region for sustainable nutritional security. The programme benefitted 60 participants, providing them with knowledge on the nutritional and economic advantages of cultivating bio-fortified maize.

Bio-Fortified Maize: Enhancing Nutrition and Economic Growth

ICAR-IIMR, Ludhiana, organized a training programme titled "Bio-Fortified Maize: Bridging the Gap Between Nutrition Security and Economic Growth" on 27^{th} February 2025, at Wadda Ghar, Punjab, under the DBT Biotech-Kisan project focused on popularizing bio-fortified maize hybrids in Himalayan states, Central India, and the North Eastern Region for sustainable nutritional security. The programme benefitted 70 participants, providing them with practical knowledge on the cultivation and nutritional and economic advantages of bio-fortified maize.

Awareness and Farmer Interface Meeting in Mirzapur, U.P.

An awareness cum interface meeting was held on 9^{th} March, 2025 at Chandapur village, Mirzapur, UP, with over 95 maize growing farmers from surrounding areas. Dr. Partik Sinodiya (BHU), Mr. Omprakash (IIMR) and progressive farmer Shri. Harivansh delivered lectures on increasing maize cultivation and production. The program included the distribution of herbicides to 20 beneficiaries for 20 acres. In this area, previously seed was distributed to 100 farmers for 62 acre area in spring season and crops stand well.

Bio-Fortified Maize: Advancing Nutrition and Farmer Prosperity

ICAR-IIMR, Ludhiana, organized a training programme titled "Bio-Fortified Maize: Paving the Way for Nutritional Advancement and Economic Prosperity" on 10^{th} March 2025, at Shamshpur Village, Ludhiana, under the DBT Biotech-Kisan project aimed at popularizing bio-fortified maize hybrids in Himalayan states, Central India, and the North Eastern Region for sustainable nutritional security.

The programme benefited 70 participants, equipping them with knowledge on the cultivation, nutritional value and economic potential of bio-fortified maize.

Zero Tillage Maize Driving Prosperity in Srikakulam

Srikakulam district, Andhra Pradesh, is emerging as a key hub for zero tillage maize cultivation, with around 1 lakh acres planted using this sustainable practice, reducing costs, improving soil health, and boosting profitability. Supported by ANGRAU, ICAR-IIMR, and Reddy's Foundation, farmers are adopting innovative techniques showcased during a field day demonstrating advanced zero tillage machinery. An awareness campaign under the MoAFW-funded Catchment Area Development Project was held on 21st March, 2025 in Pydibheemavaram village, engaging 70 stakeholders in discussions on maize cultivation opportunities and value chain linkages. Dr. H.S. Jat, Director of ICAR-IIMR, encouraged farmers to expand maize cultivation for higher income and sustainable agriculture.

Scientific Maize Management for Higher Yields in Bihar

ICAR-IIMR, Ludhiana organized a four-day training program titled "Scientific Maize Management for Maximizing Productivity and Profit in Bihar" from 24-27th March, 2025, under the ATMA-Saran, Bihar-funded scheme. The programme was attended by 45 farmers and focused on imparting scientific maize cultivation practices to enhance productivity and profitability in the region.

Best Management Practices for Maize Cultivation and Value Addition

ORMAS (Odisha Rural Development and Marketing Society) in collaboration with ICAR-IIMR, Ludhiana, organized two training programmes on "Best Management Practices for Maize Cultivation and Processing" in Udayagiri and Mohana blocks of Gajapati district. The programmes conducted from 15-18th April, 2025 were designed specifically for female tribal farmers belonging to Particularly Vulnerable Tribal Groups (PVTGs). Each training session witnessed the participation of 50 women farmers, who are prospective members of the upcoming Farmer Producer Organization (FPO) under the Mukhyamantri Makka Mission, Government of Odisha.

Empowering Farmers through Input Support under SCSP

ICAR–IIMR, Ludhiana, organized an input distribution cum training programme on 7th July, 2025 at Lapra and Bilaspur villages in Ludhiana under the SCSP initiative. The programme benefitted scheduled caste farmers of the region by providing essential inputs along with practical guidance to support improved agricultural practices and livelihood enhancement.

Promoting Maize-Based Silage for Sustainable Livestock farming in Punjab and Haryana

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana organized a field day-cum-training programme on 27th August 2025 at Saha village, Ambala, Haryana under the project "Upscaling Maize-Based Silage Value Chain in Punjab and Haryana." The event highlighted the untapped potential of kharif maize for silage-making, stressing its vital role in addressing the seasonal fodder shortage, ensuring year-round feed availability and enhancing livestock productivity. Farmers were encouraged to adopt kharif maize-based silage as a sustainable pathway to improve dairy profitability and strengthen rural incomes.

Strengthening Small-scale Farming through SCSP Input Support

An input distribution programme was organized on 2nd September 2025 at Jagraon, Ludhiana under the Scheduled Caste Sub Plan (SCSP) scheme. During the programme, essential agricultural inputs including sprayers, tarpaulins and agro-chemicals were distributed to the beneficiaries. The initiative aimed at strengthening farm operations and enhancing productivity, directly benefiting 40 farming families and supporting their livelihood improvement.

Capacity Building of Odisha Farmers on Sustainable Maize Cultivation

ICAR-IIMR, Ludhiana organized a three-day training programme on "Sustainable Maize Cultivation for Diversifying Cropping Systems and Securing Rural Livelihoods" from 8-10th September 2025. The programme hosted 27 farmers from Boudh district, Odisha, sponsored under the CDP-MLIP scheme of the Government of Odisha. The training focused on practical demonstrations, field visits and hands-on sessions aimed at strengthening farmers technical skills, promoting sustainable maize production and enhancing livelihood security.

Promoting IPM Measures for Sustainable Maize Farming in Koraput

An awareness programmes on Integrated Pest Management (IPM) along with insecticide distribution was organized on 18th September 2025 under the DMF project titled “Improving Livelihood and Nutritional Security through Scientific Maize Cultivation and Maize-Based Entrepreneurship Development in Koraput District, Odisha.” The programmes were conducted across Semiliguda, Pottangi, Laxmipur, Dasmantpur, Narayanpatna and Koraput blocks, with a focus on promoting sustainable maize cultivation practices, enhancing farmers pest management skills and strengthening livelihood security through scientific crop protection approaches.

Training on Kharif Maize Silage for Sustainable Livestock Farming

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana organized a field day-cum-training programme on 18th September 2025 at Sahdra Village, SBS Nagar, under the project “Upscaling Maize-Based Silage Value Chain in Punjab and Haryana.” The event highlighted the largely untapped opportunities of kharif maize for silage, underlining its key role in addressing seasonal fodder deficits, maintaining continuous feed supply, and enhancing livestock productivity. The farmers were encouraged to adopt maize-based silage as a sustainable strategy to enhance dairy profitability and strengthen rural livelihoods through improved fodder management practices.

Unlocking Maize’s Potential for Year-Round Fodder Availability

ICAR-IIMR, Ludhiana organized a field day-cum-training programme on 19th September 2025 at Kunjpura Village, Karnal, Haryana, under the project “Upscaling Maize-Based Silage Value Chain in Punjab and Haryana.” The programme showcased the significant potential of kharif maize for silage production, underlining its key role in addressing seasonal fodder shortages, providing continuous feed supply throughout the year, and boosting livestock productivity. Participating farmers were encouraged to adopt maize-based silage as a sustainable strategy to increase dairy profitability and strengthen rural livelihoods through improved fodder management practices.

Training to Create Awareness on Maize Silage

ICAR-IIMR, Ludhiana, organized a field day-cum-training programme on 23rd September 2025 at Hambia village, Hoshiarpur, Punjab, under the project “Upscaling Maize-Based Silage Value Chain in Punjab and Haryana.” Around 105 farmers participated to learn about kharif maize’s potential for silage, addressing seasonal fodder shortages, ensuring year-round feed, boosting livestock productivity and enhancing farm incomes. Experts from ICAR-IIMR provided practical guidance on cultivation, pest and nutrient management and silage quality, emphasizing kharif maize as a nutritious alternative to spring maize and a sustainable option beyond the rice-wheat system. The programme concluded with an engaging farmer-scientist interaction, motivating participants to embrace kharif maize-based silage technologies, supported by ongoing on-farm demonstrations

Kharif Maize for Strengthening Fodder Resources and Farm Incomes

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, organized a field day-cum-training programme on 24th September 2025 at Samrai Village, Jalandhar, Punjab, under the project "Upscaling Maize-Based Silage Value Chain in Punjab and Haryana". The programme showcased the potential of kharif maize to overcome seasonal fodder shortages, provide year-round feed, boost livestock productivity, and increase farm incomes. Farmers were provided with practical guidance on improved maize cultivation, silage production, and fodder management practices, encouraging the adoption of sustainable maize-based strategies to strengthen rural livelihoods.

Kharif Maize: Strengthening Livelihoods besides Securing Fodder Availability

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, organized a field day-cum-training programme on 25th September 2025 at Dhothar village, Ludhiana, Punjab, under the project "Upscaling Maize-Based Silage Value Chain in Punjab and Haryana." The programme highlighted the potential of kharif maize to address seasonal fodder shortages, ensure year-round feed availability, enhance livestock productivity and increase farm incomes. Farmers were provided practical guidance on improved maize cultivation, silage production and effective fodder management practices, encouraging the adoption of sustainable maize-based strategies to strengthen rural livelihoods.

Kharif Maize: Boosting Profits for Karnal Farmers

A successful awareness programme was held on 29th September 2025 at Arainpura village, Karnal, where Dr. Narendra Singh, Dr. Kamboj, and Dr. Kiran from CCS HAU, Karnal, engaged with farmers to highlight the profitability and benefits of kharif maize cultivation. The experts also held discussions with interested farmers planning to go for maize cultivation in the upcoming season. The programme was attended by 53 farmers, who were well trained with practical insights and guidance to enhance productivity and farm incomes.

Empowering Ludhiana Farmers with Advanced Maize Cultivation Practices

ICAR-IIMR, Ludhiana, organized a training-cum-awareness programme on 30th September 2025 at Chaukiman village, Jagraon block, Ludhiana, which saw active participation of over 65 maize growing farmers. The event featured scientists Dr. Romen Sharma, Dr. Deep Mohan, and Dr. B. S. Jat from ICAR–IIMR, along with Mr. Pritiraj Singh from Corteva Agriscience and Mr. Amandeep Singh (ADO, Jagraon), who provided hands-on training on advanced maize farming technologies. The experts emphasized efficient nutrient management, pest and disease control, and improved harvesting and drying techniques to enhance yields and profitability. The interactive session allowed farmers to raise queries, all of which were addressed, equipping participants with practical knowledge to adopt improved practices and achieve better returns.

Advancing Maize Farming: Empowering Faridkot Farmers

A training-cum-awareness programme was organized on 1st October 2025 at village Chak Deep Singh Wala, Block Sadiq, Faridkot, focusing on advanced maize farming technologies and kharif maize cultivation. The event saw enthusiastic participation from over 75 farmers across the district. Experts Dr. Romen Sharma, Dr. Deep Mohan, and Dr. B. S. Jat from ICAR–IIMR, along with Mr. Harmail Singh Sandhu from Corteva Agriscience, provided hands-on guidance on modern maize practices, emphasizing efficient nutrient management, integrated pest and disease control and improved harvesting and drying techniques. The interactive session encouraged active engagement from farmers, who raised multiple questions that were comprehensively addressed, equipping participants with practical knowledge to boost productivity and profitability.

Training cum Awareness Programme at Bal village, Gurdaspur

An awareness programme on maize production was successfully conducted at Bal village, Block Dhariwal, District Gurdaspur on 3rd October 2025. The event was graced by the presence of Dr. B.S. Jat, Dr. Romen Sharma, Dr. Deep Mohan, AEO Arjinder Singh, ADO Jatinder Singh, and SDM Manjit Singh. The experts emphasized the economic and environmental benefits of maize cultivation and shared advanced production technologies. A special discussion was held on the pilot project of maize and ethanol production, highlighting its role in providing additional income avenues for farmers and promoting sustainable agriculture. The programme encouraged farmers to adopt innovative practices and contribute to the diversification of Punjab's cropping system

Maize Field Day: Boosting Farmer Knowledge and Prosperity

ICAR–IIMR, Ludhiana, organized a field day on maize on 9th October 2025 at Mehraj village, District Bathinda, to promote maize cultivation and raise awareness among farmers about its benefits. Scientists from IIMR, Ludhiana, provided valuable insights on nutrient management, pest control and post-harvest practices, equipping participants with practical knowledge to enhance productivity and profitability. The farmers actively engaged with the experts, and appreciated ICAR-IIMR's efforts in promoting sustainable and profitable maize farming in the region.

Modern Maize Techniques for Higher Productivity

ICAR-IIMR, Ludhiana organized a training-cum-awareness programme at Jagraon block, Ludhiana on 10th October 2025. The event was graced by Dr. Romen Sharma, Dr. Deep Mohan and Dr. Pardeep Kumar from ICAR–IIMR, along with Mr. Pritiraj Singh from Corteva Agriscience and Mr. Amandeep Singh (ADO, Jagraon). During the event, the experts trained farmers on various advanced technologies in maize farming. They emphasized the importance of efficient nutrient management, pest and disease control and improved harvesting and drying technologies to achieve better returns. In the event, more than 50 farmers from Ludhiana were actively participated.

Empowering Fazilka Farmers with Modern Maize Cultivation Technologies

On 6th November 2025, ICAR-IIMR, Ludhiana, successfully conducted an awareness programme at Jhumianwali village, Abohar, Fazilka district, under the project "Enhancement of Maize Production in Catchment Areas of Ethanol Industries." The event brought together IIMR scientists, local farmers, agricultural researchers and industry representatives, including Bayer Crop Science and Shakti Vardhak, to promote scientific maize cultivation and market-oriented farming. Scientists Dr. Romen Sharma and Dr. Deep Mohan Mahala provided valuable insights on the latest maize technologies, improved hybrid varieties, scientific crop management and effective marketing approaches. The interactive session encouraged farmers to share experiences and challenges, while experts offered practical solutions to improve productivity and profitability. The programme successfully strengthened linkages between farmers, scientists and industries, fostering the adoption of improved maize hybrids, better crop management practices and enhanced understanding of market opportunities.

Training Programme on "Sustainable Maize Cultivation for Diversifying Cropping Systems and Securing Rural Livelihoods"

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, organized a training programme on "Sustainable Maize Cultivation for Diversifying Cropping Systems and Securing Rural Livelihoods" from 16-18th October 2025, sponsored by the Chief District Agriculture Officer, Department of Agriculture and Farmers' Empowerment, Government of Odisha, Boudh District. The programme aimed to equip farmers with knowledge and skills to adopt sustainable maize cultivation practices, diversify cropping systems, and strengthen rural livelihoods through improved productivity and profitability.

Awareness-cum-Maize Seed Distribution Programme at Himmatnagar village, Warangal district

An Awareness-cum-Maize Seed Distribution Programme was conducted at Himmatnagar village, Warangal district on 11th November 2025 under the Enhancement of Maize production under the "Enhancement of Maize Production in Catchment Areas of Ethanol Industries. The programme was organized in convergence with Dr. N. Sunil (IIMR), Dr. Sree Latha (State Agriculture Department) and stakeholders from Private Companies. During the programme, hybrid maize seeds were distributed to farmers for 60 acres area demonstration. Farmers were equipped with scientific crop management practices to enhance yield and productivity and discussions held highlighting maize as a promising crop for ethanol production.

Training cum Awareness Programme in the District Moga

ICAR–IIMR, Ludhiana organized a training-cum-awareness programme in District Moga on 11th November 2025 under the project "Enhancement of Maize Production in Catchment Areas of Ethanol Industries." During the programme, IIMR experts guided farmers on the benefits and opportunities of Kharif maize cultivation. Mr. Pritiraj Singh from Corteva Agriscience also participated in the event and interacted with the farmers. As part of the visit, the team also inspected the seed production demonstration plot at Village Gajiana village, Moga.

Training Programme on Maize Cultivation Practices and Processing at ETC Bhawanipatna, Kalahandi

ICAR–IIMR, Ludhiana, in collaboration with ORMAS, Kalahandi, organized a training programme on maize cultivation practices and processing at ETC Bhawanipatna, Kalahandi, Odisha, from 12-15th November 2025. Experts from ICAR-IIMR, including Drs. S. L. Jat, Suby S., Ph. Romen Sharma and Alok Sahoo, trained farmers and other stakeholders on various aspects of maize production, processing and value addition. The programme emphasized the promotion of scientific maize cultivation practices, improved technologies and sustainable approaches for enhancing productivity and income in the region.

Empowering Maize Farmers through Mechanized Agriculture

On 19th November 2025, ICAR-IIMR distributed multi-crop threshers to a cooperative society under the SCSP scheme, promoting farm mechanization, reducing labor-intensive drudgery and ensuring equitable access for Scheduled Caste farmers. The initiative is designed to enhance productivity, save time and effort, and empower small and marginalized farmers with modern, efficient agricultural tools. Alongside, facilitating access to mechanized equipment, the programme also encourages sustainable farming practices and strengthens the overall resilience of rural livelihoods.

Boosting Farmers Income through Kharif Maize

ICAR-IIMR, Ludhiana, conducted a training-cum-awareness programme on 22nd November 2025 at Kot Umra Village, Ludhiana, under the project "Enhancement of Maize Production in Catchment Areas of Ethanol Industries." During the programme, experts guided farmers on the benefits and opportunities of kharif maize cultivation and shared practical strategies and management practices to improve productivity and enhance farm incomes, equipping participants with the knowledge to adopt modern, profitable maize farming techniques.

Supporting SC Farmers in Mechanized Maize Cultivation

ICAR-IIMR distributed multi-crop threshers to a cooperative society under the SCSP scheme on 10th December 2025, for promoting farm mechanization, reducing labor-intensive drudgery and ensuring equitable access for Scheduled Caste farmers. The initiative aimed to boost productivity, reduce labor and time requirements and equip small and marginalized farmers with modern farming tools, while promoting sustainable and efficient agricultural practices.

Empowering Assam Farmers with High-Yielding Maize hybrid LQMH-1

Under the Institute's NEH Scheme, ICAR-IIMR, Ludhiana, implemented a promotion programme for the high-yielding maize variety LQMH-1 across various districts of Assam on 11th December 2025. The initiative covered over 375 acres and benefited more than 600 farmers, providing them with access to improved seeds and cultivation practices. The programme also included training and awareness sessions to encourage farmers to adopt high-yielding maize varieties, aiming to enhance productivity, strengthen food security and improve farm incomes in the region.

EXPOSURE VISITS OF IIMR STAFF

Maize Breeding Team Visited the AICRP Centre, Kalyani

Large-scale seed production of ICAR-IIMR developed maize hybrids, totalling around 10,000 quintals, is underway in West Bengal during Rabi 2024-25. In this regard, Dr. H. S. Jat, Director, ICAR-IIMR, and Dr. Bhupender Kumar, Senior Scientist (Maize Breeding), visited the AICRP centre, Kalyani, and reviewed ongoing seed production activities across south West Bengal from 22-24th January 2025, emphasizing the role of public-bred hybrids in meeting maize demand for the ethanol blending programme (E30). Seed production is being carried out for the established hybrid DMRH 1308, along with experimental production of new hybrids LQMH-1, IMH 229 (DMRH 1410), IMH 222, IMH 223, and IBCH 402. During the visit, ICAR-IIMR team acknowledges the support of seed growers, the Department of Agriculture, West Bengal, WBSSC, MSMEs, FPOs and partner companies in successfully strengthening maize seed production in the state.

Campaigns Under Catchment Area Project

Under the Catchment Area Project, we're driving awareness on the benefits of maize cultivation in Tarn Taran, Amritsar, Ludhiana, and Barnala on 25th May 2025. Why Maize? Here's what farmers need to know: Assured procurement prices and consistent market demand from industries. Higher yields of 25–30 quintals/acre with new high-performing genetics. Improved mechanization and better weed & nutrient management for ease of farming. Maize cultivation helps save up to 80% water and energy compared to rice—perfect for sustainable farming. Growing maize also boosts the yield of the next crop—potato or wheat—by 10–15% compared to traditional rice-based systems. We're working to establish stronger linkages among farmers, input suppliers, knowledge providers, and industries—ensuring maize becomes a profitable and climate-smart choice.

Exposure Visit to Distilleries during Training Programme

As part of the three-day training-cum-workshop on "Empowering Field Implementation for Maize-Based Bioethanol and Catchment Development" for staff associated with the Catchment Area Project, an exposure visit to distilleries was organized. The programme held from 23-25th July 2025 at ICAR-IIMR, Ludhiana, aimed to enhance participants practical understanding of maize cultivation, project execution and technical aspects essential for promoting maize-based bioethanol production in catchment areas. The visit helped deepen their understanding of the scale and importance of maize in bioethanol production, thereby equipping them with critical insights for effective implementation of catchment-based initiatives.

Interaction Meeting with the Farmers of Saurashtra

An interaction-cum-training programme with Saurashtra region farmers was held at Junagadh on 19th September 2025, highlighting maize as a potential game changer for the region. The programme was organized in collaboration with Junagadh Agricultural University and Corteva Agriscience.During the event, Dr. H. S. Jat, Director, ICAR-IIMR, emphasized that Gujarat is a net maize-deficit state and maize can be successfully introduced as an inter or sequential crop across kharif, rabi and spring seasons, especially with rising industrial demand driven by ethanol production, including a 350 KLPD ethanol plant near Ahmedabad requiring about 1,000 tonnes of maize per day. He noted that, maize once grown as a mixed crop in Saurashtra, declined due to lack of markets but now has renewed opportunities. Dr. P. D. Kumawat, Dean and Principal, JAU, highlighted the role of maize in crop diversification, sustainability, and livestock nutrition through silage, while Mr. Ashish Pandey (Corteva Agriscience) shared successful maize silage experiences from

Surendranagar. Farmers expressed interest in adopting maize due to its high productivity, mechanization and effective weed and pest management, with expectations of producing high-quality, aflatoxin-free maize under favorable climatic conditions.

EXPOSURE VISITS OF FARMERS

Farmers Explore Innovations at IIMR

An exposure visit for 40 farmers was organized at ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, on 23rd September, 2025. The participants gained practical insights into advanced maize production practices and innovative agricultural technologies through interactive sessions and field demonstrations. The visit aimed to enhance farmers knowledge and encourage the adoption of improved, research-backed farming methods.

Empowering Farmers at IIMR

On 26th September, 2025, ICAR-IIMR, Ludhiana, in collaboration with IPS Foundation, organized an exposure visit for 20 farmers to promote awareness of improved agricultural practices. The participants engaged in interactive sessions and field demonstrations, gaining practical insights into modern innovations in farming. The initiative aimed to strengthen farmers knowledge and encourage the adoption of efficient, technology-driven approaches in agriculture.

VISIT OF EMINENT SCIENTISTS TO ICAR-IIMR, LUDHIANA

Dr. D.K. Yadav (DDG, Crop Science) Visited Winter Nursery Centre, Hyderabad

On 26th April, 2025, Dr. D.K. Yadav (Deputy Director General, Crop Science), visited the Winter Nursery Centre, Hyderabad, where he inspected the renovated AICRP Cell and new Entomology lab which was deliberated by Dr. H.S. Jat, Director, ICAR-IIMR. Dr. N. Sunil briefed him on ongoing centre activities and Dr. Yadav appreciated the public sector maize programmes 35% contribution, the upgraded facilities, and the collaboration with PJTSAU. He offered valuable suggestions, encouraged staff and emphasized enhancing maize research, while Dr. H.S. Jat also inspected the fields and labs, providing further recommendations.

CIMMYT Team Reviewed Maize Trials at IIMR, Delhi Unit

On 17th October 2025, a team from CIMMYT, led by Dr. Mahesh Gathala, along with the IARI maize team and representatives from Corteva and KVSS, visited the live demonstration of maize hybrids and entomology trials at ICAR-IMR, Delhi unit. Under the guidance of the Director (Maize), the IIMR team presented the ongoing trials, which were well managed despite challenging conditions The visitors appreciated the performance and national impact of IIMR hybrids, identifying 5-8 high-yielding hybrids for further advancement.

ICAR Officials Visit IIMR to Strengthen Maize Innovation

ICAR-IIMR, Ludhiana, had the privilege of showcasing the impact and potential of its maize hybrids to distinguished leaders, Dr. M.L. Jat, Secretary DARE & Director General, ICAR; Dr. D.K. Yadav, Deputy Director General (Crop Science), ICAR; and Dr. Ch. Srinivasa Rao, Director, IARI, during their visit on 18th October, 2025. The interaction provided valuable guidance on advancing maize research to enhance farm profitability, nutritional security, entrepreneurship and the prioritization of industrially important traits.

Esteemed Visit Strengthens Maize Research at IIMR

Dr. T. R. Sharma, former Deputy Director General (Crop Improvement), ICAR, visited ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, on 20th November 2025. During the visit, he interacted with scientists, administrative and contractual staff, and appreciated the ongoing research efforts. He also offered valuable suggestions to further strengthen maize improvement programmes and enhance institutional excellence.

CAFT Trainees Explore Research Excellence at IIMR

ICAR-IIMR, Ludhiana, hosted participants of the CAFT training programme from CCSHAU, Hisar, on 28th November 2025, during their course on "Advances in Honey Bees and Native Pollinators". The trainees were introduced to the institute's research initiatives, modern laboratories, and innovative technologies through guided interactions. Engaging sessions with scientists enriched their understanding of integrated crop management and the role of pollinators in sustainable agriculture.

PARTICIPATION IN KISAN MELAS

Kisan Mela at Dr. RPCAU, Bihar

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, participated in the Kisan Mela held at Dr. Rajendra Prasad Central Agricultural University (RPCAU), Pusa, Samastipur, Bihar, from 15-17th February 2025, presenting its latest maize innovations. The institute earned the "Second Best Stall Award" in the Research Institute category, recognizing its impactful technologies and farmer outreach.

Pusa Krishi Vigyan Mela, New Delhi

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, actively participated in the Pusa Krishi Vigyan Mela (PKVM) 2025 held from 22-24th February 2025 at the Pusa campus, New Delhi, highlighting its latest farmer-focused technologies. The institute's exhibit generated strong interest for promoting sustainable maize production and advancing agri-innovation for enhanced productivity.

PAU Kisan Mela

ICAR-IIMR showcased its advanced maize technologies at the PAU Kisan Mela, organized in Ludhiana, from 21-22nd March 2025, highlighting high-yield hybrids, pest management solutions, and sustainable farming practices. The event offered farmers insights into boosting productivity and adopting climate-resilient techniques.

PAU Kisan Mela

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, participated in the PAU Kisan Mela held from 26-27th September, 2025, showcasing its latest maize production and value-added technologies. The institute's presence strengthened farmer outreach by promoting sustainable practices and boosting awareness of improved maize innovations.

ICAR-CIPHET Foundation Day Celebration and Food Processing Mela

ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, participated in the "ICAR-CIPHET Foundation Day Celebration and Food Processing Mela-2025", held on 4th October 2025. The event provided a vibrant platform for showcasing innovations in agricultural and food processing technologies. During the event, ICAR-IIMR highlighted its research contributions and value-added maize-based technologies aimed at enhancing farmers income. The participation also strengthened institutional linkages and promoted awareness on sustainable and efficient food processingpractices.

IMPORTANT MILESTONES

A Milestone in Maize Research: 55 Hybrids Identified for Release

ICAR-IIMR proudly announced a record-breaking achievement at the National Workshop held from 10-12th April 2025 at TNAU, Coimbatore, with 55 maize hybrids and varieties officially identified for release for cultivation across India. This represents the highest number of maize hybrids ever identified in a single workshop, highlighting the dedication and innovation of the Maize Research Team. These newly identified, high-yielding, and climate-resilient hybrids are expected to significantly enhance productivity, improve farmers livelihoods, and meet the growing national demand for maize in food, feed and industrial uses, particularly bioethanol. Dr. H. S. Jat, Director, ICAR-IIMR, expressed sincere gratitude to the DG and DDG (Crop Science), ICAR, along with all partners, researchers and stakeholders, for their unwavering support in advancing maize R&D in India.

Branding and Sale of IIMR Hybrid Maize Seeds

ICAR-IIMR proudly announces the branding and sale of its own hybrid maize seeds, signifying a remarkable achievement and the beginning of an inspiring journey. The high demand for IIMR hybrids is reflected in consistently receiving the highest DAC breeder seed indents through the Government of India over the past 4-5 years (26-64% share) and signing over 42 MoU's with more than 28 private seed companies. The first consignments of LQMH 1, IMH 221 (DMRH 1417), IMH 229 (DMRH 1410) and IMH 222 have been dispatched to Himachal Pradesh, Jammu & Kashmir and West Bengal under the ICAR-IIMR banner. This milestone delivers high-quality seeds to farmers at less than 50% of market prices while significantly enhancing ICAR-IIMR's outreach and revenue. The Institute expresses sincere gratitude to Dr. H. S. Jat, Director, ICAR-IIMR, for his visionary leadership and to Dr. Bhupender Kumar, Dr. S. L. Jat, Dr. B. S. Jat, and the entire administration team for their continuous support. Dr. H. S. Jat reaffirmed the Institute's commitment to the vision of the Hon'ble DG, ICAR, stating that under the DG's dynamic leadership and focus on demand-driven research and the lab-to-land mission, ICAR-IIMR remains dedicated to translating this vision into tangible, impactful outcomes on the ground.

Maize Hybrid Seed Production in Punjab Farmers Field

ICAR-IIMR, Ludhiana, has successfully conducted its first maize hybrid seed production trial in Punjab, using the hybrid DMRH 1308 in the field of Sh. Sharanveer Singh, Village Gajiana and District Moga. Currently, all maize hybrid seed used in Punjab is procured from southern India, leading to higher costs. Therefore, trials were conducted to produce maize hybrid seeds under local agro-climatic conditions, which yielded promising results. The successful trial demonstrates that high-quality seed can be produced locally, even during late Kharif, and harvested seed can be used for spring cultivation without significant storage costs. This initiative is expected to reduce seed costs, lower cultivation expenses, and nearly double returns, generating ₹3.5–4.0 lakh per hectare. The trial site was monitored by Dr. H. S. Jat, Director, ICAR-IIMR, Dr. Bhupender Kumar and Ms. Anisha. Similar trials are also being conducted in Uttar Pradesh, Rajasthan, Jharkhand, Bihar, West Bengal and Assam, supporting self-reliance and meeting regional quality seed demand.

Shunya AgriTech and IIMR Transformed Fodder Farming in India

Shunya AgriTech, Gurugram, is producing hydroponic maize fodder on a commercial scale, quickly becoming the preferred choice of farmers. The initiative was technically guided by ICAR-IIMR, addresses low animal productivity and profitability by supplying fresh green fodder along with high-quality digestible concentrate. Dr. H. S. Jat, Director, ICAR-IIMR, also visited and monitored the experiments, appreciating the encouraging results and potential impact on livestock farming.

PRESTIGIOUS AWARDS & HONOURS

Prestigious "Rashtriya Krishi Vigyan Puruskar"

Dr. H. S. Jat, Director of ICAR-IIMR, Ludhiana, was awarded the prestigious "Rashtriya Krishi Vigyan Puruskar" by DARE, Ministry of Agriculture and Farmers Welfare, Government of India, on 16th July 2025, for outstanding research in agriculture and allied sciences. This recognition underscores Dr. Jat's dedication to advancing agricultural science and promoting innovative solutions for sustainable farming. The entire IIMR community congratulate him on this remarkable achievement and wishes him continued success in his future endeavors.

Prestigious "Dr. S. K. Vasal Award"

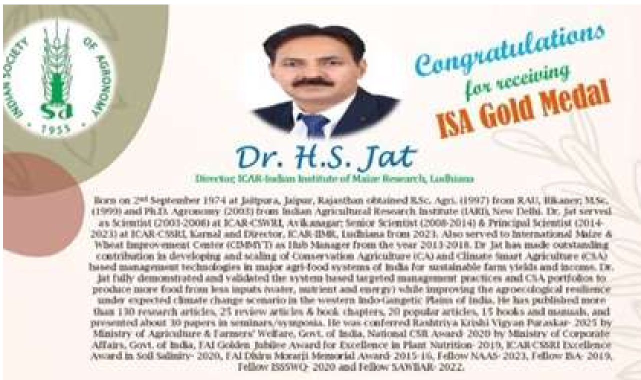
ICAR–IIMR, Ludhiana and the entire maize research community congratulate Dr. Bhupender Kumar on being conferred the prestigious Dr. S. K. Vasal Award for Excellence in Hybrid Research by the Trust for Advancement of Agricultural Sciences (TAAS) on 1st November 2025. The award, which includes a plaque, a citation, and a cash prize of ₹1.0 lakh, recognizes his outstanding contributions to maize hybrid research and development. This achievement reflects his dedication and significant impact on advancing maize research.

Prestigious "NAAS Fellowship"

Dr. S. L. Jat, Senior Scientist at ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, was elected as a Fellow of the National Academy of Agricultural Sciences (NAAS) on 17th November 2025. The recognition highlights his remarkable contributions in scientific advancement, visionary leadership and tireless commitment to agricultural research and knowledge dissemination. His work has been particularly impactful in sustainable crop production, resource management, maize-based farming systems, and the dissemination of maize technologies across the value chain. The entire IIMR fraternity congratulates Dr. S. L. Jat on this remarkable achievement and wishes him continued success in his future endeavors.

Prestigious “ISA Gold Medal”

Dr. H. S. Jat, Director of ICAR-Indian Institute of Maize Research (IIMR), Ludhiana, was awarded with the prestigious ISA Gold Medal during the “6th International Agronomy Congress” held from 24-26th November 2025 at CSIR-National Physical Laboratory (NPL), New Delhi. This esteemed recognition highlights his outstanding contributions to maize research, conservation agriculture, agricultural innovation and visionary leadership. His dedicated efforts continue to advance global food security and promote sustainable agricultural development.



हिंदी पखवाडा 2025

राजभाषा विभाग, गृह मंत्रालय, भारत सरकार के नीतिगत निर्देशानुसार, भा.कृ.अनु.प– भारतीय मक्का अनुसंधान संस्थान, लुधियाना की राजभाषा कार्यान्वयन समिति ने हर वर्ष की भाँति इस वर्ष भी संस्थान में राजभाषा हिंदी के प्रचार–प्रसार के लिए दिनांक 16 से 26 सितम्बर, 2025 के दौरान संस्थान के मुख्यालय एवं क्षेत्रीय कार्यालयों में ऑफलाइन एवं ऑनलाइन माध्यम से हिंदी पखवाडा 2025 का आयोजन किया गया। हिन्दी पखवाड़ा का शुभारम्भ 12 सितम्बर को संस्थान निदेशक की उपस्थिति में किया गया। कार्यक्रम के दौरान निदेशक महोदय ने अपने प्रेरणादायी उद्बोधन में उपस्थित सभी अधिकारियों एवं, कर्मचारियों को हिन्दी पखवाड़ा की हार्दिक शुभकामनाएँ प्रेषित कीं। उन्होंने कहा कि हिन्दी केवल एक भाषा नहीं, बल्कि हमारी सांस्कृतिक पहचान, राष्ट्रीय चेतना तथा प्रशासनिक कार्यप्रणाली का सशक्त माध्यम है। उन्होंने सभी कर्मचारियों से अपील की कि वे हिन्दी पखवाड़ा के अंतर्गत आयोजित विभिन्न प्रतियोगिताओं एवं गतिविधियों में सक्रिय सहभागिता सुनिश्चित करें तथा राजभाषा हिन्दी के संवर्धन एवं प्रसार में अपना योगदान दें। निदेशक महोदय ने अपने संबोधन में इस बात पर विशेष बल दिया कि किसी भी राष्ट्र की प्रगति उसकी भाषा की समृद्धि एवं व्यापक स्वीकृति पर निर्भर करती है। उन्होंने कहा कि प्रशासनिक कार्यों, पत्राचार, बैठकों तथा दैनिक संवाद में हिन्दी के अधिकाधिक प्रयोग से न केवल राजभाषा नीति के उद्देश्यों की पूर्ति होगी, बल्कि कार्य निष्पादन में भी सरलता एवं प्रभावशीलता आएगी। उन्होंने सभी अधिकारियों एवं कर्मचारियों से हिन्दी को व्यवहारिक एवं कार्यकारी भाषा के रूप में अपनाने का आह्वान किया।

हिन्दी पखवाड़ा के अंतर्गत इस वर्ष संस्थान द्वारा विभिन्न प्रतियोगिताओं का आयोजन ऑनलाइन एवं ऑफलाइन माध्यम से किया गया, जिनमें हिन्दी निबंध लेखन, टिप्पण एवं प्रारूप लेखन, आशुभाषण, काव्य पाठ, प्रश्नोत्तरी तथा सुलेख, अनुलेख एवं श्रुतलेख प्रतियोगिताएँ प्रमुख रहीं। इन गतिविधियों में संस्थान के वैज्ञानिकों, तकनीकी एवं प्रशासनिक कर्मचारियों के अतिरिक्त अनुसंधान सहयोगियों, वरिष्ठ एवं कनिष्ठ अनुसंधान फेलो, यंग प्रोफेशनल्स तथा अन्य संविदा कर्मियों ने उत्साहपूर्वक भाग लिया और अपनी रचनात्मक प्रतिभा का प्रदर्शन किया।

हिन्दी पखवाड़ा का समापन समारोह दिनांक 26 सितम्बर, 2025 को संस्थान में अत्यंत उत्साह एवं गरिमामय वातावरण में आयोजित किया गया। इस अवसर पर डॉ. नीरात्मा शर्मा, एसोसिएट प्रोफेसर, मालवा सेंट्रल कॉलेज ऑफ एजुकेशन, लुधियाना ने मुख्य अतिथि के रूप में कार्यक्रम की शोभा बढ़ाई। डॉ. शर्मा हिन्दी साहित्य, शिक्षा एवं सामाजिक सेवा के क्षेत्र में एक प्रतिष्ठित नाम हैं। उन्होंने पंजाब विश्वविद्यालय, चण्डीगढ़ से एम.ए., एम.एड. एवं पीएच.डी. की उपाधियाँ प्राप्त की हैं तथा फिल्म एंड टेलीविजन संस्थान, पुणे से कथा–संस्तुति में डिप्लोमा भी किया है। अपने मुख्य अतिथि संबोधन में डॉ. नीरात्मा शर्मा ने हिन्दी भाषा के महत्व, उसके सांस्कृतिक एवं राष्ट्रीय योगदान तथा वर्तमान समय में हिन्दी के बढ़ते वैश्विक प्रभाव पर प्रकाश डाला। उन्होंने कहा कि हिन्दी केवल अभिव्यक्ति का माध्यम नहीं, बल्कि

भारतीय संस्कृति, मूल्यों एवं ज्ञान परम्परा को जोड़ने वाली सशक्त कड़ी है। उन्होंने उपस्थित अधिकारियों, कर्मचारियों एवं प्रतिभागियों को अपने दैनिक जीवन एवं कार्यालयी कार्यों में हिन्दी के अधिकाधिक प्रयोग के लिए प्रेरित किया तथा राजभाषा नीति के प्रभावी क्रियान्वयन में सक्रिय सहभागिता निभाने का आह्वान किया। समापन समारोह के दौरान डॉ. शर्मा ने हिन्दी पखवाड़ा के सफल आयोजन के लिए संस्थान की सराहना की तथा विभिन्न प्रतियोगिताओं में उत्कृष्ट प्रदर्शन करने वाले प्रतिभागियों को बधाई एवं शुभकामनाएँ प्रदान कीं। उन्होंने हिन्दी के प्रचार–प्रसार को केवल औपचारिक आयोजनों तक सीमित न रखते हुए उसे कार्य–संस्कृति एवं व्यवहार का अभिन्न अंग बनाने पर बल दिया।

समारोह के दौरान संस्थान में राजभाषा हिन्दी के प्रभावी प्रयोग एवं वर्षभर हिन्दी में उत्कृष्ट कार्य निष्पादन करने वाले दो कर्मचारियों को विशेष प्रोत्साहन योजना के अंतर्गत प्रशस्ति–पत्र एवं नगद पुरस्कार प्रदान कर सम्मा. नित किया गया। इस अवसर पर संस्थान के वरिष्ठ अधि ाकारियों तथा विभिन्न क्षेत्रीय केन्द्रों के प्रमुखों ने भी अपने विचार व्यक्त करते हुए हिन्दी के व्यापक प्रयोग एवं राजभ. ाषा नीति के सफल क्रियान्वयन के प्रति अपनी प्रतिबद्धता व्यक्त की। हिन्दी पखवाड़ा के अंतर्गत आयोजित समस्त प्रतियोगिताओं एवं गतिविधियों का सफल समन्वय प्रभारी, राजभाषा डॉ. बहादुर सिंह जाट द्वारा किया गया। साथ ही, समापन समारोह का संचालन भी उनके द्वारा निदेशक डॉ. एच. एस. जाट के मार्गदर्शन एवं संरक्षण में प्रभावी ढंग से संपन्न कराया गया। कार्यक्रम का समापन सभी प्रतिभागियों, अधिकारियों एवं कर्मचारियों के प्रति धन्यवाद ज्ञापन के साथ हुआ।

हिन्दी कार्यशाला

संस्थान द्वारा हिंदी को राजभाषा के रूप में बढ़ावा देने और सरकार की आधिकारिक भाषा नीति की अनुपालना हेतु, भा.कृ.अनु.प.– भारतीय मक्का अनुसंधान संस्थान, लुधियाना द्वारा स्टाफ सदस्यों को प्रशिक्षित करने के लिए में वर्ष 2025 के दौरान भाकृअनुप– केंद्रीय फसल कटाई पश्चात इंजीनियरिंग एवं प्रौद्योगिकी संस्थान (सीफेट), लुधियाना द्वारा आयोजित की गई तीन हिंदी कार्यशालाओं (29 मई 2025, 8 अगस्त, 2025,एवं 19 दिसम्बर, 2025) में भाग लिया। इसके अलावा नरकास स्तर पर 29 जन. वरी, 2025 को आयोजित एक दिवसीय हिंदी कार्यशाला में हिंदी अधिकारी ने भाग लिया। जिसमें राजभाषा हिंदी के सुविधाजनक कार्यान्वयन, आई.टी. टूल्स और स्वस्थ जीवन जीने की कला आदि विषयों पर व्याख्यान हुए।

भा.कृ.अनु.प- भारतीय मक्का अनुसंधान संस्थान में आयोजित हिंदी पखवाड़ा की झलकियाँ

संसदीय राजभाषा समिति की द्वितीय उप-समिति द्वारा निरीक्षण उपरांत संस्थान के निदेशक डॉ. हनुमान सहाय जाट को राजभाषा कार्यान्वयन से संबंधित प्रशस्ति-पत्र प्रदान करते हुए।

भा.कृ.अनु.प.- भारतीय मक्का अनुसंधान संस्थान का संसदीय राजभाषा समिति की द्वितीय उप-समिति द्वारा राजभाषा संबंधी निरीक्षण

दिनांक 24 फरवरी, 2025 को संसदीय राजभाषा समिति की द्वितीय उप–समिति द्वारा भा.कृ.अनु.प.– भारतीय मक्का अनुसंधान संस्थान, लुधियाना का ठियोग (शिमला) की बैठक में निरीक्षण किया गया। निरीक्षण के दौरान समिति ने संस्थान में राजभाषा हिन्दी के प्रयोग, राजभाषा अधिनियम एवं नियमों के अनुपालन, पत्राचार, अभिलेखों, प्रकाशनों तथा प्रशासनिक कार्यों में हिन्दी के उपयोग की समीक्षा की। संस्थान की ओर से समिति के समक्ष राजभाषा कार्यान्वयन से संबंधित विस्तृत प्रस्तुति दी गई, जिसमें हिन्दी के प्रचार–प्रसार, कर्मचारियों के लिए आयोजित हिन्दी प्रशिक्षण कार्यक्रमों, राजभाषा संबंधी प्रतियोगिताओं एवं संस्थान द्वारा किए जा रहे विभिन्न प्रयासों की जानकारी प्रस्तुत की गई। समिति के माननीय सदस्यों ने संस्थान द्वारा प्रस्तुत राजभाषा प्रगति प्रतिवेदन एवं राजभाषा हिन्दी के कार्यान्वयन की स्थिति की समीक्षा की, जिसे संतोषजनक पाया गया। समिति के माननीय सदस्यों ने संस्थान में राजभाषा हिन्दी के प्रभावी क्रियान्वयन एवं उसके प्रचार–प्रसार के लिए किए जा रहे प्रयासों एवं कार्यों की सराहना की। उन्होंने भविष्य में कार्यालयी कार्यों, पत्राचार एवं प्रशासनिक प्रक्रियाओं में हिन्दी के प्रयोग को और अधिक सुदृढ़ एवं व्यापक बनाने हेतु उपयोगी सुझाव भी दिए। निरीक्षण कार्यक्रम में संस्थान के निदेशक डॉ. हनुमान सहाय जाट, वैज्ञानिक, डॉ. मनेश चंदर डागला, डॉ. बहादुर सिंह जाट, वरिष्ठ प्रशासनिक अधिकारी श्री बलवंत चंद कटोच, वित्त एवं लेखा अधिकारी श्री अजय टंडन तथा सहायक प्रशासनिक अधिकारी श्रीमती संदीप कौर ने सक्रिय सहभागिता की। सभी अधिकारियों ने राजभाषा हिन्दी के प्रभावी कार्यान्वयन तथा उसके निरंतर प्रोत्साहन के प्रति अपनी प्रतिबद्धता व्यक्त की।

भा.कृ.अनु.प.-भारतीय मक्का अनुसंधान संस्थान में की गई अन्य राजभाषा कार्यान्वयन गतिविधियाँ

राजभाषा कार्यान्वयन समिति (ओएलआईसी) बैठकें: संस्थान में वर्ष 2025 के दौरान राजभाषा कार्यान्वयन समिति की तीन बैठकें (22 जनवरी 2025, 24 अप्रैल 2025 एवं 30 मई 2025) आयोजित की गयी।

राजभाषा हिंदी की त्रैमासिक प्रगति रिपोर्ट: राजभाषा हिन्दी के प्रगतिशील प्रयोग के संबंध में भा.कृ.अनु.प.–भारतीय मक्का अनुसंधान संस्थान की तिमाही प्रगति रिपोर्ट की सूचना राजभाषा विभाग, गृह मंत्रालय, भारत सरकार, नई दिल्ली, भारतीय कृषि अनुसंधान परिषद, नई दिल्ली और टॉलिक–लुधियाना को भेजी जा रही है ।

हिंदी संस्करण: भारतीय मक्का अनुसंधान संस्थान की वार्षिक रिपोर्ट 2024 एवं छः माही समाचार पत्र हिंदी में प्रकाशित किया गया ।

नराकास स्तर पर प्रतियोगिताओं में सहभागिता: संस्थान के अधिकारियों ध्कर्मचारियों ने वर्ष 2025 के दौरान नराकास स्तर पर सितम्बर माह में आयोजित विभिन्न हिंदी प्रतियोगिताओं में भाग लिया ।

CHAPTER-8

TRAINING & CAPACITY BUILDING

A. Training and capacity Building of ICAR Employees

A.1. Under approved HRD Annual Training Plan (ATP) 2025

A.1.1: Scientific

Human Resource Development Unit

During 2025, ICAR-Indian Institute of Maize Research continued to strengthen Human Resource Development through various trainings, workshops, exposure visits and digital learning programmes for scientific, technical and administrative staff. Employees actively participated in capacity-building programmes on climate-smart agriculture, artificial intelligence, leadership, governance and communication skills. The institute also promoted continuous learning through the iGOT Karmayogi portal. In addition, several trainings and awareness programmes were organized for farmers, farm women, researchers and extension personnel to disseminate improved maize technologies, entrepreneurship opportunities and sustainable agricultural practices across different states of India.

Trainings Attended by Employees under HRD

S N	Name	Designation	Title of Training	From	To	Duration (Days)	Organising Institute	Online /Offline
A. Scientists								
1	Alok Kumar Sahoo	Scientist	Advances in Mobile Application Development	05-08-2024	09-08-2024	5	ICAR-NAARM, Hyderabad, Telangana	Online
2	Alok Kumar Sahoo	Scientist	Direct Training Skills	18-08-2025	22-08-2025	5	ISTM, New Delhi	Offline
3	Bahadur Singh Jat	Scientist	Climate-Smart Maize Agriculture for Food and Energy Security in India	05-03-2025	25-03-2025	21	ICAR-IIMR and ICAR-CIPHET, Ludhiana, Punjab	Offline
4	Deep Mohan Mahala	Scientist	Conjunctive Water Use and Agricultural Water Productivity under Changing Climate	18-02-2025	20-02-2025	3	ICAR-IIWM, Bhubhneswar, Odisha	Offline
5	Deep Mohan Mahala	Scientist	Tools and Techniques for Artificial Intelligence based Web Application Development in Agriculture	04-03-2025	24-03-2025	21	ICAR-IASRI, New Delhi	Offline
6	Manesh Chander Dagla	Senior Scientist	Analysis of Multi-Environment Trials	17-09-2025	19-09-2025	3	ICAR-NAARM, Hyderabad, Telangana	Online
6	Manesh Chander Dagla	Senior Scientist	"Development of Master Trainer" under the Rashtriya Jan Seva Programme (Phase–2)	08-12-2025	10-12-2025	3	ICAR-NDRI, Karnal, Haryana	Offline & App Based

7	Mukesh Choudhary	Scientist	Fundamentals of Genomic Predictions and Data-Driven Crop Breeding Training Course	24-11-2025	28-11-2025	5	ICAR-IIRR, Hyderabad, Telangana	Offline
8	Pravin Bagaria	Scientist	AI in Agriculture	06-01-2025	10-01-2025	5	ICAR-IASRI New Delhi	Online
9	Pravin Bagaria	Scientist	Climate Smart Maize Agriculture for Food and Energy Security in India	05-03-2025	25-03-2025	21	ICAR-IIMR and ICAR-CIPHET, Ludhiana, Punjab	Offline
10	Shyam Bir Singh	Principal Scientist	Analysis of Multi-Environment Trials	17-09-2025	19-09-2025	3	ICAR-NAARM, Hyderabad, Telangana	Online
11	Sunil Neelam	Principal Scientist	Advanced training cum exposure visit to Global Maize Programme	22-09-2025	28-09-2025	7	CIMMYT, Nairobi, Kenya	Offline
12	Sunil Neelam	Principal Scientist	Plant Quarantine Procedures for Import and Export	05-05-2025	09-05-2025	5	NIPHM, Hyderabad, Telangana	Offline
B. Administration								
1	Ajay Kumar Tandon	Finance & Account Officer	Workshop on preparation of EFC/SFC	01-09-2025	02-09-2025	2	ISTM, New Delhi	Offline
2	Reema Nandal	Assistant	Module-II training of DR-Assistants 2024	17-02-2025	21-02-2025	5	ICAR-NDRI, Karnal, Haryana	Offline
3	Sweta Kaim	Assistant	module-II training of DR-Assistants 2024	17-02-2025	21-02-2025	5	ICAR-NDRI, Karnal, Haryana	Offline
4	Tanuj	Assistant	MS Excell	06-08-2025	07-08-2025	2	ISTM, New Delhi	Offline
5	Tanuj	Assistant	module-II training of DR-Assistants 2024	17-02-2025	21-02-2025	5	ICAR-NDRI, Karnal, Haryana	Offline
6	Usha Birdi	Assistant	Workshop on preparation of EFC/SFC	01-09-2025	02-09-2025	2	ISTM, New Delhi	Offline

Other Trainings Attended by Employees (2025)

SN	Name	Designation	Title of Training	From	To	Duration (Days)	Organising Institute	Online /Offline
1	Ankita Kataria	Scientist	115th Foundation Course for Agricultural Research Scientists (FoCARS)	08-08-2025	25-11-2025	107	ICAR-NAARM, Hyderabad, Telangana	Offline
2	Athare Prakash G.	Scientist	Foundation Course for Agricultural Research Services, 115 (FOCARS, 115)	11-08-2025	25-11-2025	107	ICAR-NAARM, Hyderabad, Telangana	Offline

3	K Kamesh Krishnamoorthy	Scientist	Foundation Course for Agricultural Research Services, 115 (FOCARS, 115)	11-08-2025	25-11-2025	107	ICAR-NAARM, Hyderabad, Telangana	Offline
4	Shyam Bir Singh	Principal Scientist	State level workshop and exhibition on maize	19-02-2025	19-02-2025	1	Hotel Hyatt Regency, Lucknow organized by the Ministry of Agriculture and Farmer's Welfare, Government of Uttar Pradesh	Offline
5.	Alla Singh	Scientist	LQMS 17025	02-12-2025	05-12-2025	4	NITS, Noida	Online

Trainings Imparted by Institute to Various Stakeholders (2025)

SN	Title of Training	Total Participants	Female Participants	Funding Agency	From (Date)	To (Date)	Duration (Days)	Organising Team (Names)	Place of Training Organised
	A. Farm Women								
1	Bio-fortified maize: Paving the way for nutritional advancement and economic prosperity	60	60	DBT Biotech Kisan	10-02-2025	10-02-2025	1	Shankar Lal Jat & Ph Romen Sharma	Shamshpur, Ludhiana, Punjab
2	Bio-fortified Maize: A gateway to nutrition and economic prosperity	60	60	DBT Biotech Kisan	25-02-2025	25-02-2025	1	Shankar Lal Jat & Ph Romen Sharma	Khandoor, Ludhiana, Punjab
3	Bio-fortified Maize: Bridging the gap between nutrition security and economic growth	70	70	DBT Biotech Kisan	27-02-2025	27-02-2025	1	Shankar Lal Jat & Ph Romen Sharma	Wadda Ghar, Moga, Punjab
	B. Farmers								
4	Awareness program on the promotion of maize was organized in the catchment areas of ethanol industries	32	5	Catchment Area Project	22-01-2025	22-01-2025	1	Shankar Lal Jat, Ph Romen Sharma, & Bahadur Singh Jat	Janaiya, Farrukhabad, Uttar Pradesh
5	Field Day Programme for Enhancement of Maize Production in Catchment Areas of Ethanol Industries	112	0	Catchment Area Project	20-03-2025	20-03-2025	1	Shankar Lal Jat, Ph Romen Sharma, & Bahadur Singh Jat	Kedarpur Khurd, Chhindwara, Madhya Pradesh

6	Field Day Programme for Enhancement of Maize Production in Catchment Areas of Ethanol Industries	70	36	Catch-ment Area Project	21-03-2025	21-03-2025	1	Shankar Lal Jat, Ph Romen Sharma, & Bahadur Singh Jat	Pydib-heema-varam, Andhra Pradesh
7	Field Day Programme for Enhancement of Maize Production in Catchment Areas of Ethanol Industries	110	5	Catchment ASrea Project	25-03-2025	25-03-2025	1	Shankar Lal Jat, Ph Romen Sharma, & Bahadur Singh Jat	Kurali, Karnal, Haryana
8	Scientific Maize Management for Maximizing Productivity and Profit in Bihar	45	0	AT-MA-Sa-ran, Bi-har-funded scheme	24-03-2025	27-03-2025	4	Manesh Chander Dagla, Bharat Bhusan, & Ph Romen Sharma	ICAR-IIMR, Ludhiana, Punjab
9	Improved Seed Production Techniques for Training & Field visit under SCSP	29	18	IARI, Jharkhand, Hazarib-agh	04-03-2025	05-03-2025	2	Course Director: Chikkappa G. Karjagi Course Co-ordinators: Bhupender Kumar, P. Lakshmi Soujanya, Subby S. B., & Alok Kumar Sahoo	Vishnupur, Begusarai, Bihar
10	Awareness Programme cum Exposure visit of Farmers	157	21	ATMA, Lakhi Sarai	11-02-2025	14-02-2025	4	RM-R&SPC, ICAR-IIMR, Begusarai, Bihar	Vishnupur, Begusarai, Bihar
11	Field day cum trainings on Maize Silage	394	70	Under silage project (Upscaling maize-based si-lage value chain in Punjab and Hary-ana)	23-10-2025 25-10-2025 23-11-2025	23-10-2025 25-10-2025 23-11-2025	1	-	Ludhiana, Punjab SBS Nagar, Punjab Jalandhar, Punjab

12	Best Management Practice in maize for Value Addition and Bio- Ethanol Production in Uttar Pradesh	42	0	Directorate of Agriculture, Government of Uttar Pradesh.	26-02-2025	28-02-2025	3	Course Director: Chikkappa G. Karjagi Course Co-ordinators: Mamta Gupta, Mukesh Choudhary, & Alok Kumar Sahoo	Vishnupur, Begusarai, Bihar
	C. BTM, ATM and Progressive Farmers								
13	Maize Based Entrepreneurship Development	27	10	BAMETI, Bihar, Patna.	02-03-2025	04-03-2025	3	Course Director: Hanuman Sahay Jat Course Co-ordinators: Chikkappa G. Karjagi, Manesh Chander Dagla, Bahadur Singh Jat, & Alok Kumar Sahoo	Vishnupur, Begusarai, Bihar
14	Scientific Maize Cultivation for Improving Productivity	33	6	BAMETI, Bihar, Patna	25-02-2025	25-02-2025	1	Course Director: Alok Kumar Sahoo Course Coordinator: Abhijit Kumar Das	Vishnupur, Begusarai, Bihar
15	Best Management Practice in maize for Profitable Bio- Ethanol Production	19	3	BAMETI, Bihar, Patna	06-03-2025	08-03-2025	3	Course Director: Hanuman Sahay Jat Course Co-ordinators: Chikkappa G. Karjagi, Mamta Gupta, Praveen Kumar Bagaria, & Alok Kumar Sahoo	Vishnupur, Begusarai, Bihar

16	Value addition of maize Entrepreneurship Development	23	7	BAMETI, Bihar, Patna.	18-02-2025	20-02-2025	3	Course Director: Chikkappa G. Karjagi Course Co-ordinators: Manesh Chander Dagla, Bahadur Singh Jat, & Alok Kumar Sahoo	Vishnupur, Begusarai, Bihar
	D. Farmers, Inputs suppliers, Distillery Units, & Researchers								
17	Awareness program on the promotion of maize was organized in the catchment areas of ethanol industries	40	0	Catchment area project	25-01-2025	25-01-2025	1	Shankar Lal Jat, Ph Romen Sharma, & Bahadur Singh Jat	Nashipur, Karnal, Haryana
18	Awareness program on the promotion of maize was organized in the catchment areas of ethanol industries	95	0	Catchment area project	07-03-2025	07-03-2025	1	Shankar Lal Jat, Ph Romen Sharma, & Bahadur Singh Jat	Chandapur, Mirzapur, Uttar Pradesh
19	Awareness program on the promotion of maize was organized in the catchment areas of ethanol industries	90	0	Catchment area project	20-03-2025	20-03-2025	1	Shankar Lal Jat, Ph Romen Sharma, & Bahadur Singh Jat	Bhatkurri Farrukhabad, Uttar Pradesh
20	Field Day Programme for Enhancement of Maize Production in Catchment Areas of Ethanol Industries	120	35	Catchment area project	21-03-2025	21-03-2025	1	Shankar Lal Jat, Ph Romen Sharma, & Bahadur Singh Jat	Mundera Thakurai, Gorakhpur, Uttar Pradesh
21	Awareness program on the promotion of maize was organized in the catchment areas of ethanol industries	91	5	Catchment area project	26-03-2025	26-03-2025	1	Shankar Lal Jat, Ph Romen Sharma, & Bahadur Singh Jat	Damla, Yamuna Nagar, Haryana
	E. Researchers, Academicians, & Extension Workers								

22	Climate-Smart Maize Agriculture for Food and Energy Security in India”	23	5	ICAR	05-03-2025	25-03-2025	21	Hanuman Sahay Jat, Nachiket Kotwaliwale, Shankar Lal Jat, Bhupender Kumar, Mamta Gupta, Ph Romen Sharma, Manju Bala, & Deepika Goswami	ICAR-CIPHET, Ludhiana, Punjab
24	Workshop on Biotech Interventions in Maize: Challenges and Opportunities	79	18	Organized by: ICAR-IIMR, Ludhiana & Biotech Consortium India Limited (BCIL), New Delhi. Funded by: Federation of Seed Industry of India (FSII), New Delhi	01/09/2025	01/09/2025	1	Coordinator- Krishan Kumar Co-coordinators: Bhupender Kumar, Mukesh Choudhary, Alla Singh, & Mamta Gupta	ICAR-IIMR, Ludhiana
F.	Scientist of DRPCAU, Pusa, BAU, Sabour, ICAR-RCER, Patna, ICAR-IIMR, Ludhiana & New Delhi, RMR & SPC, Begusarai, BAMETI, Bihar and Representative of Seed & Ethanol Companies								
25	Workshop of Maize for bio-ethanol programme (Road map & Strategies)	65	5	BAMETI, Bihar, Patna.	19-03-2025	19-03-2025	1	Course Director: Hanuman Sahay Jat Course Co-ordinators: Chikkappa G. Karjagi, Shankar Lal Jat, Bhupender Kumar, & Alok Kumar Sahoo	BAMETI, Patna, Bihar
G.	Scientists, Administrative, Technical and supporting staff of ICAR-IIMR, Ludhiana								

26	"Capacity Building for Effective Public Service Delivery" Under Rashtriya Karmayogi Jan Seva (RKJS)-Phase-II	21	4	ICAR-IIMR, Ludhiana	23-01-2026	23-01-2026	1	Manesh Chander Dagla, Romen Sharma, Deep Mohan Mahla & Prashant Garg Resource Persons: Dr. MC Dagla, ICAR-IIMR, Ludhiana Dr. Sujatha Sethy, ICAR-CIPHET, Ludhiana	ICAR-IIMR, Ludhiana

कर्मयोगी भारत

लोकहितं मम करणीयम्

Courses Completed by Employees on iGoT Karmayogi Portal (2025)

SN	Course Name
Ajay Kumar Tandon, Finance and Account Officer	
1	Introduction to E-Office
2	Govt Accounting System
3	Public Finance
4	CCS LTC Rules
5	सामान्य योग अभ्यासक्रम
6	*Rajbhasha* Hindi
7	Green Revolution to Amrit Kaal
8	Overview of Viksit Bharat 2047
9	Public Procurement Framework of GOI
10	Leave Rules - Updated
11	Deputation and Absorption
12	Pay Fixation - Updated
13	General Conditions of Service in Fundamental and Supplementary Rules
14	Stress Management
15	DigiLocker- Your documents anytime, anywhere
Alla Singh, Scientist	
1	Managing and Leading Teams
2	Critical Thinking
3	Building Climate Resilience in Agriculture Systems
4	Overview of Viksit Bharat 2047
5	Introduction to E-Office
Alok Kumar Sahoo, Scientist	
1	Maternal, Infant and Young Child Nutrition
2	Overview of Viksit Bharat 2047
3	Building Climate Resilience in Agriculture Systems
4	AI led Digital Transformation in Agriculture
5	Understanding Mission Karmayogi
Ankita Kataria, Scientist	
1	AI led Digital Transformation in Agriculture
2	STRESS MANAGEMENT
3	Green Revolution to Amrit Kaal
4	Time Management
5	GenAI for Everyone
6	Conduct Rules
Athare Prakash Goraksha, Scientist	
1	Conduct Rules
Bharat Bhushan, Senior Scientist	
1	Leave Rules
2	Effective Communication
3	Critical Thinking

4	GenAI for Everyone
5	BASICS OF CLIMATE CHANGE: Science Behind Stories
6	Building Climate Resilience in Agriculture Systems
7	Travelling Allowance
8	Annual Performance Appraisal Report (APAR) - Updated
9	Do's and Dont's for Government Employees- Hindi
10	Parliamentary Procedures
11	Pay Fixation
12	Agriculture and Rural Development
13	Bikes of Bijnor: A waste to wealth public bike sharing programme
Bhupender Kumar, Senior Scientist	
1	AI led Digital Transformation in Agriculture
2	Agriculture and Rural Development
3	Building Climate Resilience in Agriculture Systems
4	Communication for Citizen Centricity
5	Green Revolution to Amrit Kaal
6	Effective Techniques to Manage Stress
7	Public Procurement Framework of GOI
8	Overview of Viksit Bharat 2047
9	GenAI for Everyone
10	Public - Private Partnership (Hindi)
11	Public Policy Writing
12	Purpose-Driven Leadership
13	Stress Management
14	STRESS MANAGEMENT
15	Time Management
Deep Mohan Mahala, Scientist	
1	Critical Thinking
2	Yoga Break at Workplace
3	AI led Digital Transformation in Agriculture
4	Agriculture and Rural Development
5	Green Revolution to Amrit Kaal
6	GenAI for Everyone
7	Leadership in Project Management
8	Cyber Security Basics
Kamal Vats, Technical Officer	
1	वकिसति भारत 2047
Krishan Kumar, Scientist	
1	AI led Digital Transformation in Agriculture
2	Introduction to Emerging Technologies
3	Agriculture and Rural Development
4	Green Revolution to Amrit Kaal
5	STRESS MANAGEMENT

6	Time Management
7	GenAI for Everyone
8	Building Climate Resilience in Agriculture Systems
Manesh Chander Dagla, Senior Scientist	
1	Orientation Module on Mission LiFE
2	सूर्य नमस्कार का महत्व एवं उपयोगिता
3	Best Practices for Connecting with Citizens
4	सांप या किसी और जानवर का काट लेना
5	Evidence-based Policy Making
6	Public Governance Models
P. Lakshmi Soujanya, Senior Scientist	
1	Yoga Break at Workplace
2	Leave Rules
3	Introduction to E-Office
4	Effective Techniques to Manage Stress
5	AI led Digital Transformation in Agriculture
6	AIS (Conduct) Rules, 1968
7	GenAI for Everyone
8	Gender Sensitization - 1
9	BASICS OF CLIMATE CHANGE: Science Behind Stories
10	Green Revolution to Amrit Kaal
11	Time Management
Pardeep Kumar, Scientist	
1	Introduction to E-Office
2	Prabha Singh, Scientist
3	GenAI for Everyone
4	Yoga Break at Workplace
5	Agriculture and Rural Development
Prabhjot Kaur, Assistant	
1	Gender Sensitisation
2	Leadership in Project Management
Rahul, Technical Assistant	
1	विकसित भारत 2047
Ramesh Kumar, Principal Scientist	
1	Introduction to E-Office
Ravi Chaudhary, Personal Assistant	
1	तनाव और तनाव प्रबंधन
2	दहेज मृत्यु प्रकरणों की जाँच और न्यायिक प्रक्रिया
Sandeep Kaur, Assistant Administrative Officer	
1	Annual Performance Appraisal Report (APAR) - Updated
2	Overview of Viksit Bharat 2047
Seema Sepat, Senior Scientist	
1	AIS (Conduct) Rules, 1968

2	STRESS MANAGEMENT
3	Time Management
Shyam Bir Singh, Principal Scientist	
1	Introduction to E-Office
2	Right to Information (RTI)
3	Annual Performance Appraisal Report (APAR)
4	Yoga Break at Workplace
5	Prevention of Sexual Harassment of Women at Workplace
Sunil Neelam, Principal Scientist	
1	Decision Making
2	Critical Thinking
3	AI led Digital Transformation in Agriculture
4	Building Climate Resilience in Agriculture Systems
5	Purpose-Driven Leadership
6	Managing and Leading Teams
7	Green Revolution to Amrit Kaal
Yathish K R, Scientist	
1	Introduction to E-Office
2	STRESS MANAGEMENT
3	Leadership
4	Preventive Vigilance
5	Leave Rules
6	Critical Thinking
7	Overview of Viksit Bharat 2047
8	Building Climate Resilience in Agriculture Systems
9	Effective Techniques to Manage Stress
10	Public - Private Partnership

CHAPTER-9

AWARDS & RECOGNITIONS

Awards 2025

Sr. No.	Name of Scientist	Name of Awards	Society/Organization	Year
1.	Dr. HS Jat	Director, ICAR–Indian Institute of Maize Research (IIMR), Ludhiana, was conferred the Rashtriya Krishi Vigyan Puraskar 2025 for Best Research in Agriculture and Allied Sciences by DARE, Ministry of Agriculture & Farmers' Welfare, Government of India.	DARE, Ministry of Agriculture & Farmers' Welfare, Government of India	2025
2.	Dr. Shankar Lal Jat	Secretary, Maize Technologists Association of India	New Delhi	2025
		NAAS Fellow	New Delhi	2025
3.	Dr. SB Singh	Awarded with "Fellow of ISPGR (2024)" for significant contribution in the field of Plant Genetic Resources by the Indian Society of Plant Genetic Resources	NASC Complex, Pusa New Delhi.	2025
4.	Dr. Chander Mohan Chauhan	Young Scientist Award	In National Conference on Scientific Innovation in Agriculture, Humanities and Allied Sciences for Better Public Health and Environment Organized by Agriculture Forum for Technical Education of Farming Society, Rajasthan	2025
5.	Dr. Abhijit Das	INSA Visiting Scientist Award	INSA	2025
6.	Dr. Mukesh Choudhary	NAAS Young Scientist Award 2025 awarded by National Academy of Agricultural Sciences	NAAS	2025
7.	Dr. Deep Mohan	Best Poster Award in the Sixth International Agronomy Congress on "Re-envisioning Agronomy for Smart Agri-food Systems and Environmental Stewardship	National Agricultural Science Complex (NASC), New Delhi, India	2025

ANNEXURE-I

List of cultivars identified during 68th Annual Maize Workshop

On the occasion of 68th Annual Maize Workshop, the Variety Identification Committee (VIC) meeting was convened under the Chairmanship of Dr. D. K. Yadav, Deputy Director General (Crop Science), Indian Council of Agricultural Research, New Delhi on April 11, 2025 at 6.30PM in hybrid mode (physically and also through Video conferencing) at Tamil Nadu Agriculture University, Coimbatore. Director, ICAR-IIMR, Ludhiana, the Member Secretary and Twelve VIC members and six resource persons from the ICAR-Indian Institute of Maize Research (ICAR-IIMR) attended the meeting. The following cultivars were identified for release and notification by the VIC; the brief details of the cultivars are given below.

S. No.	Cultivar	AICRP Centre/ Pvt. Company	Public/ Private	Average Yield (t/ha)	Area of adaptation		Maturity or Type of Corn	Season
					Zone(s)	States		
1	IMH 235 (IM-HS-20R-11)	IIMR, Ludhiana	Public	9.3	NEPZ	Eastern UP, Bihar, Jharkhand, Orissa and West Bengal	Medium	Rabi
2	IMH 234 (IMHSB 20R-3)	ICAR-IIMR, Ludhiana	Public	9.8	NEPZ, PZ	Eastern UP, Bihar, Jharkhand, Orissa, West Bengal, Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Telangana	Medium	Rabi
3	PM 21204L	Corteva Agriscience, Siddipet, Telangana	Private	10.6	NEPZ, PZ, CWZ	Eastern UP, Bihar, Jharkhand, Orissa, West Bengal, Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu. Telangana, Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Late	Rabi
4	BH 417193	MRC, PJTSAU, Hyderabad	Public	10.5	PZ	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Telangana	Late	Rabi

S. No.	Cultivar	AICRP Centre/ Pvt. Company	Public/ Private	Average Yield (t/ha)	Area of adaptation		Maturity or Type of Corn	Season
					Zone(s)	States		
5	SYN 217806	Syngenta India Pvt Ltd, Pune, Maharashtra	Private	9.9	NWPZ, NEPZ, CWZ	Punjab, Haryana, Plains of Uttarakhand, Western UP and Delhi NCR, Eastern UP, Bihar, Jharkhand, Orissa, West Bengal Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Medium	Spring & Rabi
6	BH 417206	MRC, PJTSAU, Hyderabad	Public	10.7	PZ	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Telangana	BH 417206	MRC, PJTSAU, Hyderabad
7	BH 417182	MRC, PJTSAU, Hyderabad	Public	10.7	PZ	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Telangana	Medium	Rabi
8	BMH 18-2	MRC, PJTSAU, Hyderabad	Public	10.5	PZ, CWZ	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu, Telangana, Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Medium	Rabi
9	VNR 37706	VNR Seeds, Raipur	Private	10.6	NWPZ	Punjab, Haryana, Plains of Uttarakhand, Western UP and Delhi NCR	Medium	Spring
10	JH 18056	PAU, Ludhiana	Public	10.4	NWPZ	Punjab, Haryana, Plains of Uttarakhand, Western UP and Delhi NCR	Medium	Spring

S. No.	Cultivar	AICRP Centre/ Pvt. Company	Public/ Private	Average Yield (t/ha)	Area of adaptation		Maturity or Type of Corn	Season
					Zone(s)	States		
11	MBC 21-10	RPCAU, Dholi, Samastipur, Bihar	Public	2.2	NWPZ	Punjab, Haryana, Plains of Uttarakhand, Western UP and Delhi NCR	Early	Rabi
12	MPC 2141	RPCAU, Dholi, Samastipur, Bihar	Public	4.5	NWPZ	Punjab, Haryana, Plains of Uttarakhand, Western UP and Delhi NCR	Medium	Rabi
13	APQH 1	ICAR-IARI, New Delhi	Public	8.0	NWPZ, NEPZ, PZ, CWZ	Punjab, Haryana, Plains of Uttarakhand, Western UP, Delhi NCR, Eastern UP, Bihar, Jharkhand, Orissa, West Bengal, Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu. Telangana, Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Medium	Rabi

S. No.	Cultivar	AICRP Centre/ Pvt. Company	Public/ Private	Average Yield (t/ha)	Area of adaptation		Maturity or Type of Corn	Season
					Zone(s)	States		
14	APQH 5	ICAR-IARI, New Delhi	Public	7.9	NWPZ, NEPZ, PZ, CWZ	Punjab, Haryana, Plains of Uttarakhand, Western UP, Delhi NCR, Eastern UP, Bihar, Jharkhand, Orissa, West Bengal, Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu. Telangana, Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Medium	Rabi
15	PM 22117	Corteva Agriscience, Siddipet, Telangana	Private	8.3	CWZ	Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Late	Kharif
16	HARLAL 24	Harlal seeds, Hyderabad, Telangana	Private	10.2	PZ	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Telangana	Late	Kharif
17	ADV 7434	Advanta, Hyderabad, Telangana	Private	9.3	PZ, CWZ	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu, Telangana, Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Late	Kharif
18	SRMH 999	Sri Rama Seeds, Kurnool, Andhra Pradesh	Private	10.1	PZ	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Telangana	Late	Kharif

S. No.	Cultivar	AICRP Centre/ Pvt. Company	Public/ Private	Average Yield (t/ha)	Area of adaptation		Maturity or Type of Corn	Season
					Zone(s)	States		
19	SYN 221610 L	Syngenta India Pvt Ltd, Pune, Maharashtra	Private	10.1	PZ	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Telangana	Late	Kharif
20	VNR 4324	VNR Seeds, Raipur	Private	9.7	PZ	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Telangana	Late	Kharif
21	HM 22201	Rallis India Limited, Bengaluru	Private	9.9	PZ, CWZ	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu, Telangana, Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Late	Kharif
22	BIO 9766	Bio seeds, Hyderabad, Telangana	Private	10.0	PZ	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Telangana	Late	Kharif
23	KMH 8206	Kaveri seeds, Hyderabad, Telangana	Private	9.2	PZ, CWZ	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu, Telangana, Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Late	Kharif
24	KMH 8208	Kaveri seeds, Hyderabad, Telangana	Private	10.0	PZ	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Telangana	Late	Kharif
25	KMH 8388	Kaveri seeds, Hyderabad, Telangana	Private	9.8	PZ	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Telangana	Late	Kharif

S. No.	Cultivar	AICRP Centre/ Pvt. Company	Public/ Private	Average Yield (t/ha)	Area of adaptation		Maturity or Type of Corn	Season
					Zone(s)	States		
26	CP 509	CP Seeds, Bangalore, Karnataka	Private	8.3	PZ, CWZ	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu, Telangana, Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Medium	Kharif
27	IW 8477 (9243C)	Bayer seeds,Hyderabad, Telangana	Private	10.2	PZ	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Telangana	Medium	Kharif
28	JH 20088	PAU, Ludhiana	Public	8.1	CWZ	Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Medium	Kharif
29	RCRMH 20	UAS, Raichur,Karnataka	Public	8.1	CWZ	Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Medium	Kharif
30	BH 417189	MRC, PJTSAU, Hyderabad	Public	8.4	CWZ	Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Medium	Kharif
31	BH 417144	MRC, PJTSAU, Hyderabad	Public	8.1	CWZ	Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Medium	Kharif
32	IX 7851 (DKC 7240)	Bayer seeds,Hyderabad, Telangana	Private	8.4	NHZ, CWZ	Jammu and Kashmir, Himachal Pradesh, Meghalaya, Assam, Tripura, Arunachal Pradesh, Sikkim, Mizoram, Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Early	Kharif

SN	Cultivar	AICRP Centre/ Pvt. Company	Public/ Private	Average Yield (t/ha)	Area of adaptation		Maturity or Type of Corn	Season
					Zone(s)	States		
33	SRMH 99M66	Sri Rama Seeds, Kurnool, Andhra Pradesh	Private	8.0	NWPZ, CWZ	Punjab, Haryana, Plains of Uttarakhand, Western UP, Delhi NCR, Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Early	Kharif
34	SMH 9099	Invicta seeds, Secunderabad, Telangana	Private	7.8	CWZ	Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Early	Kharif
35	CP 111	CP Seeds, Bangalore, Karnataka	Private	7.3	NWPZ	Punjab, Haryana, Plains of Uttarakhand, Western UP and Delhi NCR	Early	Kharif
36	FMH 24	ICAR-VPKS, Almora	Public	6.8	NHZ	Jammu and Kashmir, Himachal Pradesh, Meghalaya, Assam, Tripura, Arunachal Pradesh, Sikkim and Mizoram	-	Kharif
37	FLPH 45	ICAR-VPKS, Almora	Public	6.0	NHZ	Jammu and Kashmir, Himachal Pradesh, Meghalaya, Assam, Tripura, Arunachal Pradesh, Sikkim and Mizoram	-	Kharif
38	FQH 160	ICAR-VPKS, Almora	Public	7.2	CWZ	Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	-	Kharif

S. No.	Cultivar	AICRP Centre/ Pvt. Company	Public/ Private	Average Yield (t/ha)	Area of adaptation		Maturity or Type of Corn	Season
					Zone(s)	States		
39	AQWH 5	ICAR-IARI, New Delhi	Public	7.2	NWPZ, NEPZ, PZ, CWZ	Punjab, Haryana, Plains of Uttarakhand, Western UP, Delhi NCR, Eastern UP, Bihar, Jharkhand, Orissa, West Bengal, Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu, Telangana, Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	-	Kharif
40	APQWH 8	ICAR-IIMR, Ludhiana	Public	8.4	PZ	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Telangana	-	Kharif
41	FQPLH 20	ICAR-VPKS, Almora	Public	5.2	NHZ	Jammu and Kashmir, Himachal Pradesh, Meghalaya, Assam, Tripura, Arunachal Pradesh, Sikkim and Mizoram	-	Kharif
42	IQPMH 2114	ICAR-IIMR, Ludhiana	Public	6.0	NEPZ, CWZ	Eastern UP, Bihar, Jharkhand, Orissa, West Bengal, Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Medium	Kharif

S. No.	Cultivar	AICRP Centre/ Pvt. Company	Public/ Private	Average Yield (t/ha)	Area of adaptation		Maturity or Type of Corn	Season
					Zone(s)	States		
43	IQPMH 2204	ICAR-IIMR, Ludhiana	Public	8.6	PZ, CWZ	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu, Telangana, Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Medium	Kharif
44	IQPMH 2205	ICAR-IIMR, Ludhiana	Public	8.5	NWPZ	Punjab, Haryana, Plains of Uttarakhand, Western UP and Delhi NCR	Medium	Kharif
45	IQPMH 2113	ICAR-IIMR, Ludhiana	Public	7.1	NEPZ, CWZ	Eastern UP, Bihar, Jharkhand, Orissa, West Bengal,, Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Medium	Kharif
46	IQPMH 2203	ICAR-IIMR, Ludhiana	Public	7.1	CWZ	Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Medium	Kharif
47	IQPMH 2105	ICAR-IIMR, Ludhiana	Public	7.4	NHZ	Jammu and Kashmir, Himachal Pradesh, Meghalaya, Assam, Tripura, Arunachal Pradesh, Sikkim and Mizoram	Medium	Kharif

S. No.	Cultivar	AICRP Centre/ Pvt. Company	Public/ Private	Average Yield (t/ha)	Area of adaptation		Maturity or Type of Corn	Season
					Zone(s)	States		
48	FSCH 131	ICAR-VPKS, Almora	Public	11.5	NHZ, NWPZ	Jammu and Kashmir, Himachal Pradesh, Meghalaya, Assam, Tripura, Arunachal Pradesh, Sikkim, Mizoram, Punjab, Haryana, Plains of Uttarakhand, Western UP and Delhi NCR	-	Kharif
49	CP GOLDEN (GOLDEN SWEET SUPER)	CP Seeds, Bangalore, Karnataka	Private	15.6	NHZ	Jammu and Kashmir, Himachal Pradesh, Meghalaya, Assam, Tripura, Arunachal Pradesh, Sikkim and Mizoram	-	Kharif
50	APTSKH1	ICAR-IARI, New Delhi	Public	8.9	NWPZ, NEPZ, PZ, CWZ	Punjab, Haryana, Plains of Uttarakhand, Western UP, Delhi NCR, Eastern UP, Bihar, Jharkhand, Orissa, West Bengal, Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu, Telangana, Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	-	Kharif

S. No.	Cultivar	AICRP Centre/ Pvt. Company	Public/ Private	Average Yield (t/ha)	Area of adaptation		Maturity or Type of Corn	Season
					Zone(s)	States		
51	ISCH 602	ICAR-IIMR, Ludhiana	Public	10.6	NWPZ, PZ, CWZ	Punjab, Haryana, Plains of Uttarakhand, Western UP, Delhi NCR, Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu, Telangana, Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	-	Kharif
52	JH 32484	PAU, Ludhiana	Public	1.9	NHZ, NEPZ, PZ, CWZ	Jammu and Kashmir, Himachal Pradesh, Meghalaya, Assam, Tripura, Arunachal Pradesh, Sikkim, Mizoram , Eastern UP, Bihar, Jharkhand, Orissa, West Bengal, Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu ,Telangana, Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	-	Kharif

S. No.	Cultivar	AICRP Centre/ Pvt. Company	Public/ Private	Average Yield (t/ha)	Area of adaptation		Maturity or Type of Corn	Season
					Zone(s)	States		
53	IBH 11-223	ICAR-IIMR, Ludhiana	Public	1.9	NHZ, NEPZ, PZ, CWZ	Jammu and Kashmir, Himachal Pradesh, Meghalaya, Assam, Tripura, Arunachal Pradesh, Sikkim, Mizoram , Eastern UP, Bihar, Jharkhand, Orissa, West Bengal, Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu ,Telangana, Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Early	Kharif
54	IBH 11-227	ICAR-IIMR, Ludhiana	Public	1.7	PZ, CWZ	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu ,Telangana, Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	Early	Kharif
55	ADC 4	ICAR-IARI, Dharwad	Public	7.5	NHZ	Jammu and Kashmir, Himachal Pradesh, Meghalaya, Assam, Tripura, Arunachal Pradesh, Sikkim and Mizoram	-	Kharif

AICRP Zones : Northern Hill (NHZ), North Western Plain (NWPZ), North Eastern Plain (NEPZ), Peninsular (PZ), Central Western Zone (CWZ).

ANNEXURE-II

Maize Hybrids/OPVs Notified during 2025 for commercial cultivation.

S. No.	Cultivar	Nature of cultivar	Contributing ICAR Institute/ AICRP Centre/ SAU/ Private Organization	Public/ Private	Notification Date	Notification No.	Maturity	Area of adaptation	Avrg Yield (t/ha)	Cropping season	Type
1	IMH 232	Single Cross Hybrid (SCH)	ICAR-IIMR, Ludhiana	Public	31.12.2025	S.O. 6123(E).	Medium (87-90 days)	Eastern UP, Bihar, Jharkhand, Orissa and West Bengal.	6.7	Kharif	Field Corn
2	IMH 233	SCH	ICAR-IIMR, Ludhiana	Public	31.12.2025	S.O. 6123(E).	Medium (118-128 days)	Punjab, Haryana, Plains of Uttarakhand, Western UP and Delhi NCR.	9.8	Rabi	Field Corn
3	IMH 234	SCH	ICAR-IIMR, Ludhiana	Public	31.12.2025	S.O. 6123(E).	Medium (147 NEPZ, 105 PZ)	Eastern UP, Bihar, Jharkhand, Orissa, WB, Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Telangana.	9.8	Rabi	Field Corn
4	IMH 235	SCH	ICAR-IIMR, Ludhiana	Public	31.12.2025	S.O. 6123(E).	Medium (140-150 days)	Eastern UP, Bihar, Jharkhand, Orissa and West Bengal.	9.3	Rabi	Field Corn

S. No.	Cultivar	Nature of culti-var	Contributing ICAR Institute/ AICRP Centre/ SAU/ Private Organization	Pub-lic/ Pri-vate	Notification Date	Notifica-tion No.	Maturity	Area of adaptation	Avrg Yield (t/ha)	Crop-ping season	Type
6	IBCH 403	SCH	ICAR-IIMR, Ludhiana	Public	31.12.2025	S.O. 6123(E).	Early	J&K, Himachal Pradesh, Uttara-khand, NEH Regions, Meghalaya, Sikkim, Assam, Tripura, Nagaland, Manipur, Arunachal Pradesh; UP, Odisha, Bihar, Assam, West Bengal and Jharkhand; Maharash-tra, Karnata-ka, Andhra Pradesh, Tamil Nadu, Telangana; Rajasthan, Gujarat, MP & Chhattis-garh	1.9	Kharif	Baby Corn
7	IQMH 206	SCH	ICAR-IIMR, Ludhiana	Public	31.12.2025	S.O. 6123(E).	Medium (91 days)	Bihar, Jharkhand, Odisha, West Bengal and Eastern Uttar Pradesh	5.8	Kharif	QPM
8	IQMH 207	SCH	ICAR-IIMR, Ludhiana	Public	31.12.2025	S.O. 6123(E).	Medium (90 days)	Bihar, Jharkhand, Odisha, West Bengal and Eastern Uttar Pradesh	6.9	Kharif	QPM
9	IQMH 208	SCH	ICAR-IIMR, Ludhiana	Public	31.12.2025	S.O. 6123(E).	Medium (88 days)	Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	6.8	Kharif	QPM
10	IQMH 209	SCH	ICAR-IIMR, Ludhiana	Public	31.12.2025	S.O. 6123(E).	Medium (102 days)	Jammu and Kashmir, Himachal Pradesh, Meghalaya, Assam, Tripura, Arunachal Pradesh, Sikkim and Mizoram	7.4	Kharif	QPM

S. No.	Cultivar	Nature of culti-var	Contributing ICAR Institute/ AICRP Centre/ SAU/ Private Organization	Pub-lic/ Pri-vate	Notification Date	Notifica-tion No.	Maturity	Area of adaptation	Avrg Yield (t/ha)	Crop-ping season	Type
11	IQMH 210	SCH	ICAR-IIMR, Ludhiana	Public	31.12.2025	S.O. 6123(E).	Medium (102 days)	Punjab, Haryana, Western Ut-tar Pradesh, Plains of Uttarakhand	8.5	Kharif	QPM
12	IQMH 211	SCH	ICAR-IIMR, Ludhiana	Public	31.12.2025	S.O. 6123(E).	Medium (102 days)	Bihar, Jharkhand, Odisha, West Bengal and Eastern Uttar Pradesh, Rajasthan, Gujarat, Madhya Pradesh and Chhattisgarh	7.1	Kharif	QPM
13	IQMH 212	SCH	ICAR-IIMR, Ludhiana	Public	31.12.2025	S.O. 6123(E).	Medium (91 days)	Bihar, Jharkhand, Odisha, West Bengal and Eastern Uttar Pradesh	7.1	Kharif	QPM
14	IQMH 213	SCH	ICAR-IIMR, Ludhiana	Public	31.12.2025	S.O. 6123(E).	Medium (91 days)	Rajasthan, Gujarat, Madhya Pradesh and Chhattisgarh	7.1	Kharif	QPM
15	IQMH 214	SCH	ICAR-IIMR, Ludhiana	Public	31.12.2025	S.O. 6123(E).	Medium (91 days)	Maharash-tra, Karnata-ka, Telanga-na, Andhra Pradesh, Tamil Nadu, Rajasthan, Guja-rat,Madhya Pradesh and Chhattisgarh	8.6	Kharif	QPM
16	ADV 7154 (ADV-7434)	SCH	Advanta Enterprises Limited, Hyderabad	Private	31.12.2025	S.O. 6123(E).	Late maturing (110-115 days)	Karnataka, Maharash-tra, Tamil Nadu, Telan-gana Andhra Pradesh, Rajasthan, Madhya Pradesh, Gujarat, and Chhattisgarh	9.3	Kharif	Field corn
17	Rajendra Baby Corn-2 (MBC 21-10)	SCH	RPCAU, Dholi	Public	31.12.2025	S.O. 6123(E).	Early (80 days)	Punjab, Haryana, Uttarakhand plains, Delhi and western Uttar Pradesh	2.2	Rabi	Baby-corn

S. No.	Cultivar	Nature of culti-var	Contributing ICAR Institute/ AICRP Centre/ SAU/ Private Organization	Pub-lic/ Pri-vate	Notification Date	Notifica-tion No.	Maturity	Area of adaptation	Avrg Yield (t/ha)	Crop-ping season	Type
18	Rajendra Pop Corn 2 (MPC-2141)	SCH	RPCAU, Dholi	Public	31.12.2025	S.O. 6123(E).	Medi-um(90 days)	Punjab, Haryana, Uttarakhand plains, Delhi and western Uttar Pradesh	4.5	Rabi	Pop-corn
19	VNR-4324	SCH	VNR Seeds Pvt. Ltd. Raipur	Private	31.12.2025	S.O. 6123(E).	Medium (110-115 days)	Karnataka, Andhra Pradesh, Telangana, Maharashtra and Tamil Nadu	9.7	Kharif	Field corn
20	VNR-4445 (VNR-37706)	SCH	VNR Seeds Pvt. Ltd. Raipur	Private	31.12.2025	S.O. 6123(E).	Medium (115-120 days)	Punjab, Haryana, Uttarakhnad plain,Delhi, and Western Uttar Pradesh	10.6	Rabi	Field corn
21	JKMH-4546	SCH	JK Agri.-Ge-netics Ltd.	Private	31.12.2025	S.O. 6123(E).	Medium (100-110 days)	Maharash-tra, Karnata-ka, Andhra Pradesh, Telangana and Tamil Nadu	10.5	Kharif	Field corn
22	SRMH 999	SCH	Sri Rama Genetics Pvt. Ltd, Kurnool, AP	Private	31.12.2025	S.O. 6123(E).	Late(120-125 days)	Maharash-tra, Karnata-ka, Andhra Pradesh, Telangana and Tamil Nadu	10.1	Kharif	Field corn
23	SRMH 99M66	SCH	Sri Rama Genetics Pvt. Ltd, Kurnool, AP	Private	31.12.2025	S.O. 6123(E).	Early (105-110 days)	Punjab, Haryana, Delhi, Uttarakhand Plain West-ern Uttar Pradesh, Rajasthan, Gujrat and Madhya Pradesh	8	Kharif	Field corn
24	SMH 9099	SCH	Invivta Agri-tech India Pri-vate Limited, Secundrabad, Telangana	Private	31.12.2025	S.O. 6123(E).		Rajasthan, Gujarat and Madhya Pradesh	7.8	Kharif	Field corn
25	CP.111	SCH	CP Seeds, Bangalore	Private	31.12.2025	S.O. 6123(E).	Early (100-110 days)	Punjab, Haryana, Delhi, Uttarakhand Plains and Western Ut-tar Pradesh	7.3	Kharif	Field corn

S. No.	Cultivar	Nature of culti-var	Contributing ICAR Institute/ AICRP Centre/ SAU/ Private Organization	Pub-lic/ Pri-vate	Notification Date	Notifica-tion No.	Maturity	Area of adaptation	Avrg Yield (t/ha)	Crop-ping season	Type
26	CP.509	SCH	CP Seeds, Bangalore	Private	31.12.2025	S.O. 6123(E).	Medium (100-110 days)	Punjab, Haryana, Delhi, Uttarakhand Plains, Uttar Pradesh, Bihar, Jharkhand, Odisha and West Bengal	8.3	Kharif	Field Corn
27	CP Golden Sweet Super (Misthi)	SCH	CP Seeds, Bangalore	Private	31.12.2025	S.O. 6123(E).	Medium to late (Green year har vest:70-75 days)	Jammu and Kashmir, Himachal Pradesh, Uttara-khand (Hill region), Hill Region of Meghalaya, Sikkim, As-sam, Tripura Nagaland, Manipur and Arunachal Pradesh	15.6	Kharif	Sweet-corn
28	DHM 211 (Telangana Makka-5) (BH-417193)	SCH	PJTSAU, Hyderabad	Public	31.12.2025	S.O. 6123(E).	Late (110-115 days)	Telangana, Andhra Pradesh, Karnataka, Tamil Nadu and Ma-harshtra	10.5	Rabi	Field corn
29	DHM 213 (Telangana Makka-6) (BH-417144)	SCH	PJTSAU, Hyderabad	Public	31.12.2025	S.O. 6123(E).	Medium (95-100 days	Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	8.1	Kharif	Field corn
30	DHM 218 (Telangana Makka-7) (BH-417189)	SCH	PJTSAU, Hyderabad	Public	31.12.2025	S.O. 6123(E).	Medium (100-105 days)	Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	8.4	Kharif	Field corn
31	DM 9229 (HM-22201)	SCH	Rallis India Limited, Bengaluru	Private	31.12.2025	S.O. 6123(E).	Medium (100-105 days)	Maharash-tra, Karnata-ka, Telanga-na, Andhra Pradesh and Tamil Nadu	9.9	Kharif	Field corn

S. No.	Cultivar	Nature of culti-var	Contributing ICAR Institute/ AICRP Centre/ SAU/ Private Organization	Pub-lic/ Pri-vate	Notification Date	Notifica-tion No.	Maturity	Area of adaptation	Avrg Yield (t/ha)	Crop-ping season	Type
32	VL Sweet Corn Hybrid 4 (VL Madhubala) (FSCH 131)	SCH	ICAR-VP-KAS, Almora	Public	31.12.2025	S.O. 6123(E).	Early (72-75 days)	Jammu and Kashmir, Uttara-khand Hills, Himachal Pradesh, Arunachal Pradesh, Assam, Manipur, Meghalaya, Nagaland, Sikkim, Tripura, Uttarakhand Plain, West-ern Uttar Pradesh, Delhi, Haryana and Punjab	11.5	Kharif	Sweet-corn
33	VL Biofor-tified Maize Hybrid 201 (VL Suposh-ita) (FMH 24)	SCH	ICAR-VP-KAS, Almora	Public	31.12.2025	S.O. 6123(E).	Medium (95-100 days)	Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura	6.8	Kharif	Bio-fortified
34	VL Biofor-tified Maize Hybrid 101 (VL Lophy)	SCH	ICAR-VP-KAS, Almora	Public	31.12.2025	S.O. 6123(E).	Medium (90-95 days)	Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura	6.1	Kharif	Bio-fortified
35	PDKV Aarambha (BMH 18-2)	SCH	PDKV, Akola	Public	31.12.2025	S.O. 6123(E).	Medium (95-102 days)	Karnataka, Maharashtra, Tamil Nadu, Telangana, Andhra Pradesh, Rajasthan, Madhya Pradesh, Gujarat and Chhattisgarh	10.5	Rabi	Field Corn

S. No.	Cultivar	Nature of culti-var	Contributing ICAR Institute/ AICRP Centre/ SAU/ Private Organization	Pub-lic/ Pri-vate	Notification Date	Notifica-tion No.	Maturity	Area of adaptation	Avrg Yield (t/ha)	Crop-ping season	Type
36	1035D923-01 (PM21204L)	SCH	Pioneer Hyb. Ltd (Corteva Agri. Sci.), Telangana	Private	31.12.2025	S.O. 6123(E).	Late (110-135 days	Andhra Pradesh, Telangana, Maharashtra, Karnataka, Tamil Nadu, Bihar, Uttar Pradesh, West Bengal, Jharkhand, Odisha, Rajasthan, Madhya Pradesh, Gujarat and Chhattisgarh	10.6	Rabi	Field Corn
37	P3309 (PM 22117)	SCH	Pioneer Hyb. Ltd (Corteva Agri. Sci.), Telangana	Private	31.12.2025	S.O. 6123(E).	Late (125-135 days)	Madhya Pradesh, Chhattisgarh, Rajasthan and Gujarat	8.3	Kharif	Field Corn
38	Harlal-24	SCH	Harlal Seeds Pvt Ltd, Hyderabad	Private	31.12.2025	S.O. 6123(E).	Late (115-120 days)	Maharashtra, Andhra Pradesh, Telangana, Karnataka, Tamil Nadu	10.2	Kharif	Field Corn
39	Bioseed 9766	SCH	Bioseed Research India, Hyderabad	Private	31.12.2025	S.O. 6123(E).	Late (100-105 days)	Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Telangana	10.0	Kharif	Field Corn
40	APQH 1	SCH	ICAR-IARI, New Delhi	Public	31.12.2025	S.O. 6123(E).	Meditm (90-95 days)	Spring season: Punjab, Haryana, Delhi, Uttarakhand Plains and Western UP. Rabi season: Bihar, Jharkhand, Odisha, Eastern UP, Assam, West Bengal, Maharashtra, Telangana, Andhra Pradesh, Karnataka, Tamil Nadu, Gujarat, MP, Chhattisgarh, and Rajasthan	8.0	Rabi	Bio-fortified

S. No.	Cultivar	Nature of culti-var	Contributing ICAR Institute/ AICRP Centre/ SAU/ Private Organization	Pub-lic/ Pri-vate	Notification Date	Notifica-tion No.	Maturity	Area of adaptation	Avrg Yield (t/ha)	Crop-ping season	Type
41	APQH 5	SCH	ICAR-IARI, New Delhi	Public	31.12.2025	S.O. 6123(E).	Medium (90-95 days)	Spring season: Punjab, Haryana, Delhi, Uttarakhand (Plain) and Western Uttar Pradesh. Rabi season: Bihar, Jharkhand, Odisha, Eastern Uttar Pradesh, Assam, West Bengal, Maharashtra, Telangana, Andhra Pradesh, Karnataka, Tamil Nadu, Gujarat, Madhya Pradesh, Chhattisgarh, and Rajasthan	7.9	Rabi	Bio-fortified
42	ADC-3 Pusa Composite-5 (PC-5))	Com-posite	ICAR-IARI, Dharwad	Public	31.12.2025	S.O. 6123(E).	Medium (103 days)	Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Meghalaya, Sikkim, Assam, Tripura, Nagaland, Manipur and Arunachal Pradesh	7.1	Kharif	Field corn
43	AH 8323 (Pusa Early Hybrid Maize- 6)	SCH	ICAR-IARI, Dharwad	Public	31.12.2025	S.O. 6123(E).	Early	Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	8.1	Kharif	Field corn

S. No.	Cultivar	Nature of culti-var	Contributing ICAR Institute/ AICRP Centre/ SAU/ Private Organization	Pub-lic/ Pri-vate	Notification Date	Notifica-tion No.	Maturity	Area of adaptation	Avrg Yield (t/ha)	Crop-ping season	Type
44	Punjab Baby Corn 2	SCH	PAU, Ludhi-ana	Public	31.12.2025	S.O. 6123(E).	Early	Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Meghalaya, Sikkim, Assam, Tripura, Nagaland, Manipur and Arunachal Pradesh	1.9	Kharif	Baby-corn
45	PMH 15	SCH	PAU, Ludhi-ana	Public	31.12.2025	S.O. 6123(E).	Early	Gujarat, Rajasthan, Madhya Pradesh and Chhattisgarh	7.4	Kharif	Field Corn
46	PMH 16	SCH	PAU, Ludhi-ana	Public	31.12.2025	S.O. 6123(E).	Early	Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Meghalaya, Sikkim, Assam, Tripura, Nagaland, Manipur and Arunachal Pradesh	8.0	Kharif	Field Corn
47	RCRMH 20	SCH	UAS, Raichur	Public	31.12.2025	S.O. 6123(E).	Medium (105-110 days)	Gujarat, Rajasthan and Madhya Pradesh	8.1	Kharif	Field Corn
48	Indam 1202	SCH			31.12.2025	S.O. 6123(E).		Assam			
49	Pant Sankar Makka-7 (PSM-7) (DH-344)	SCH	GBPUA&T, Pantnagar	Public	31.12.2025	S.O. 6123(E).	Medium (90-95 days)	Uttarakhand	5.6	Kharif	Field Corn
50	Pant Sankar Makka-8 (PSM-8) (DH-346)	SCH	GBPUA&T, Pantnagar	Public	31.12.2025	S.O. 6123(E).	Medium (90-97 days)	Uttarakhand	5.7	Kharif	Field Corn
51	COH (M) 12 (CMH 15-005)	SCH	TNAU, Coim-batore	Public	31.12.2025	S.O. 6123(E).	Late (110 days)	Tamil Nadu	8.1	Kharif	Field Corn

S. No.	Cultivar	Nature of cultivar	Contributing ICAR Institute/ AICRP Centre/ SAU/ Private Organization	Public/ Private	Notification Date	Notification No.	Maturity	Area of adaptation	Avrg Yield (t/ha)	Cropping season	Type
52	R 8050 (R-3437)	SCH	Rasi Seeds (P) Ltd, Coimbatore	Private	13.05.2025	SO 2128 (E)	Late (100 days)	Gujarat, Rajasthan, Madhya Pradesh and Chhattisgarh	9.1	Kharif	Field corn
53	TMMH-2882	SCH	Trimurti Plant Sciences Pvt. Ltd, Hyderabad	Private	13.05.2025	SO 2128 (E)	Late (135-140 days)	Gujarat, Rajasthan, Madhya Pradesh and Chhattisgarh	10.6	Rabi	Field corn
54	NK- 7660 (SYN-207660)	SCH	Syngenta India Pvt. Ltd, Pune	Private	13.05.2025	SO 2128 (E)	Medium (106-130)	Uttar Pradesh (West), Haryana, New Delhi, Punjab, Uttarakhand (Plain), Karnataka, Andhra Pradesh, Tamil Nadu and Telangana, Maharashtra	9.8	Rabi	Field corn
55	NK- 7884 (SYN-207884)	SCH	Syngenta India Pvt. Ltd, Pune	Private	13.05.2025	SO 2128 (E)	Medium (130 days)	Uttar Pradesh (West), Haryana, New Delhi, Punjab, Uttarakhand (Plain)	10.3	Rabi	Field corn
56	SMH 4555	SCH	Invicta Agritech India Pvt Ltd, Secunderabad	Private	13.05.2025	SO 2128 (E)	Early (105-110 days)	Uttar Pradesh (West), Haryana, New Delhi, Punjab, Uttarakhand (Plain), Rajasthan, Gujarat and Madhya Pradesh, Chhattisgarh	7.4	Kharif	Field corn
57	ADV 785 (ADV-7733)	SCH	Advanta Enterprises Ltd, Hyderabad	Private	13.05.2025	SO 2128 (E)	Late (140-155 days)	Bihar, Jharkhand, Odisha, West Bengal, Assam and Eastern Uttar Pradesh	10	Rabi	Field corn

S. No.	Cultivar	Nature of cultivar	Contributing ICAR Institute/ AICRP Centre/ SAU/ Private Organization	Public/ Private	Notification Date	Notification No.	Maturity	Area of adaptation	Avrg Yield (t/ha)	Cropping season	Type
57	ADV 752 (ADV-7211)	SCH	Advanta Enterprises Ltd, Hyderabad	Private	13.05.2025	SO 2128 (E)	Late (110-115 days)	Karnataka, Maharashtra, Tamil Nadu, Telangana and Andhra Pradesh	10	Kharif	Field corn
58	Pusa Super Sweet Corn-3 (APSKH -1)	SCH	ICAR-IARI, New Delhi	Public	13.05.2025	SO 2128 (E)	Medium (90 days)/ (NA for Sweet corn)	NWPZ: Haryana, Delhi, Uttrakhand (Plain), Uttar Pradesh (Western region); NEPZ: Uttar Pradesh (Eastern region), West Bengal, Bihar, Jharkhand, Odisha, PZ: Karnataka, Tamil Nadu, Andhra Pradesh , Maharashtra, Telangana, CWZ: Chhattisgarh, Madhya Pradesh, Gujarat and Rajasthan	11.7	Kharif	Sweet Corn
59	Pusa Waxy Maize Hybrid-1 (AQWH-4)	SCH	ICAR-IARI, New Delhi	Public	13.05.2025	SO 2128 (E)	Medium (90 days)	Punjab, Haryana, Delhi, Uttarakhand (Plain), Uttar Pradesh (Western region)	7.2.	Kharif	Waxy
60	Pusa Male Sterile Baby Corn Hybrid-3 (ABHS-27)	SCH	ICAR-IARI, New Delhi	Public	13.05.2025	SO 2128 (E)	Medium (85 days)	Gujarat, Madhya Pradesh, Chhattisgarh and Rajasthan	1.4	Kharif	Baby corn
61	Pusa Biofortified Maize Hybrid-8 (ALQH-9)	SCH	ICAR-IARI, New Delhi	Public	13.05.2025	SO 2128 (E)	Medium (90-95 days)	Bihar, Jharkhand, Odisha, Uttar Pradesh (Eastern region), West Bengal	4.9	Kharif	Biofortified

S. No.	Cultivar	Nature of culti-var	Contributing ICAR Institute/ AICRP Centre/ SAU/ Private Organization	Pub-lic/ Pri-vate	Notification Date	Notifica-tion No.	Maturity	Area of adaptation	Avrg Yield (t/ha)	Crop-ping season	Type
62	Pusa Biofor-tified Maize Hybrid-6 (APTQH-1)	SCH	ICAR-IARI, New Delhi	Public	13.05.2025	SO 2128 (E)	Medium (90-95 days)	(NWPZ) Punjab, Haryana, Delhi, Uttarakhand (Plain), Ut-tar Pradesh (Western region); (NEPZ) Bihar, Jharkhand, Odisha, Ut-tar Pradesh (Eastern region), West Bengal and (CWZ) Gujarat, Madhya Pradesh, Chhattisgarh and Rajas-than	7.4	Kharif	Bio-fortified
63	Pusa Biofor-tified Maize Hybrid- 7 (ALPQH-1)	SCH	ICAR-IARI, New Delhi	Public	13.05.2025	SO 2128 (E)	Medium (90-95 days)	NWPZ: Punjab, Haryana, Delhi, Uttarakhand (Plain), Ut-tar Pradesh (Western region) CWZ: Gu-jarat, Mad-hya Pradesh, Chhattisgarh and Rajas-than	7.2	Kharif	Bio-fortified
64	Pusa HQPM4 Improved (APQH-4)	SCH	ICAR-IARI, New Delhi	Public	13.05.2025	SO 2128 (E)	Medium (90-95 days)	NWPZ: Punjab, Haryana, Delhi, Uttarakhand (Plain), Ut-tar Pradesh (Western region) CWZ: Gu-jarat, Mad-hya Pradesh, Chhattisgarh and Rajas-than	7.8	Kharif	Bio-fortified

S. No.	Cultivar	Nature of culti-var	Contributing ICAR Institute/ AICRP Centre/ SAU/ Private Organization	Pub-lic/ Pri-vate	Notification Date	Notifica-tion No.	Maturity	Area of adaptation	Avrg Yield (t/ha)	Crop-ping season	Type
65	HQPM- 29	SCH	CCSHAU, Karnal	Public	13.05.2025	SO 2128 (E)	Medium (105 days)	Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Meghalaya, Sikkim, Assam, Tripura, Nagaland, Manipur and Arunachal Pradesh	7.2	Kharif	QPM/ Bio-fortified
66	HPC- 4	SCH	CCSHAU, Karnal	Public	13.05.2025	SO 2128 (E)	Medium (116 days)	Punjab, Haryana, Delhi, Plains of Uttara-khand and Western Ut-tar Pradesh	4.5	Rabi/ Spring	Pop corn
67	DKC-9126	SCH	Bayer Crop Science Ltd, Karnataka	Private	13.05.2025	SO 2128 (E)	Late (120 days)	Maharash-tra, Karnata-ka, Andhra Pradesh, Tamil Nadu and Telangana, Jammu and Kashmir, Himachal Pradesh and Uttarakhand	9	Kharif	Field corn
68	DKC-9133	SCH	Bayer Crop Science Ltd, Karnataka	Private	13.05.2025	SO 2128 (E)	Late (115 days)	Rajasthan, Gujarat, Chhattisgarh and Madhya Pradesh	6.8	Kharif	Field corn
69	DKC-9144	SCH	Bayer Crop Science Ltd, Karnataka	Private	13.05.2025	SO 2128 (E)	Medium (105-110 days)	Andhra Pradesh, Telangana, Maharash-tra, Karnata-ka and Tamil Nadu	8.6	Kharif	Field corn
70	DKC-9165	SCH	Bayer Crop Science Ltd, Karnataka	Private	13.05.2025	SO 2128 (E)	Late (120-130 days)	Rajasthan, Madhya Pradesh, Chhattisgarh and Gujarat	10.3	Kharif	Field corn

S. No.	Cultivar	Nature of cultivar	Contributing ICAR Institute/ AICRP Centre/ SAU/ Private Organization	Public/ Private	Notification Date	Notification No.	Maturity	Area of adaptation	Avrg Yield (t/ha)	Cropping season	Type
71	KMH- 8333	SCH	Kaveri seed Company Ltd., Secunderabad	Private	13.05.2025	SO 2128 (E)	Late (100-105 days)	Andhra Pradesh, Telangana, Karnataka, Maharashtra and Tamil Nadu	10.5	Kharif	Field corn
72	Rajendranagar Makka-182 (DHM 182) (BH-417182)	SCH	PJTSAU, Hyderabad	Public	13.05.2025	SO 2128 (E)	Medium (98-103 days)	Telangana	10.2	Rabi & Kharif	Field corn
73	Sikkim Organic Maize Composite-3/ SKOMC-3 (KDM-34)	Composite	ICAR Regional Complex for NEH, Sikkim Centre and SKUAST, Srinagar	Public	13.05.2025	SO 2128 (E)	Medium (95-100 days)	Sikkim	4	Spring	Field corn
74	Sikkim Organic Maize Composite-4/ SKOMC-4 (KDM-35)	Composite	ICAR Regional Complex for NEH, Sikkim Centre and SKUAST, Srinagar	Public	13.05.2025	SO 2128 (E)	Medium (95-100 days)	Sikkim	3.8	Spring	Field corn
75	Gujarat Maize Hybrid 5 (GMH 5: Panam Gold) (GYH-1911)	SCH	Anand Agricultural University, Godhra	Public	13.05.2025	SO 2128 (E)	Medium (100-105 days)	Gujarat	7.1	Kharif	Field corn
76	MAH 15-84	SCH	UAS, Mandya	Public	13.05.2025	SO 2128 (E)	Medium (125-130 days)	Karnataka	9.1	Kharif	Field corn

Application Filed of Plant varieties during 2025 for registration under PPV&FR Act 2001.

Sr. No.	Name of Hybrid	Name of Institute	Application/ Registration No.	Date of Filing
1	IMH 225	ICAR-IIMR, Ludhiana	REG/2025/1120	16/09/2025
2	IMH 226	ICAR-IIMR, Ludhiana	REG/2025/1119	16/09/2025
3	IMH 229	ICAR-IIMR, Ludhiana	REG/2025/1124	16/09/2025
4	IMH 230	ICAR-IIMR, Ludhiana	REG/2025/1123	16/09/2025
5	IMH 231	ICAR-IIMR, Ludhiana	REG/2025/1122	16/09/2025
6	IBCH 401	ICAR-IIMR, Ludhiana	REG/2025/1121	16/09/2025
7	IBCH 402	ICAR-IIMR, Ludhiana	REG/2025/1139	22/09/2025

Application Granted of maize hybrids during 2025 under PPV&FR Act 2001.

Sr. No.	Name of Hybrid	Name of Institute	Application/ Registration No.	Date of Registration
1	IMH 227	ICAR-IIMR, Ludhiana	REG/2025/0031	26/03/2024
2	IMH 228	ICAR-IIMR, Ludhiana	REG/2025/0032	27/03/2024
3	IMH 224	ICAR-IIMR, Ludhiana	REG/2023/0039	11/06/2025
4	LQMH 1	ICAR-IIMR, Ludhiana	REG/2021/0193	17/10/2020
5	Palam Sankar Makka 1	CSK HPKVV, Bajaura	REG/2016/699	5/5/2025
6	Palam Sankar Makka 2	CSK HPKVV, Bajaura	REG/2016/698	5/5/2025

Commercialization of maize hybrids during 2025

S. No.	Contracting firm/ Organization	From	To	Name of Commercial-ized Technol-ogy	Amount of tech-nology & Earned Revenue (Rs. in lakhs)
1	Bharatiya Beej Sahakari Samiti Ltd, New Delhi	15.07.2025	14.07.2030	DMRH 1301	5.40
2	Chakra Seeds, Andhra Pradesh	03.09.2025	02.09.20230	DMRH 1301	3.00
3	Dhanlaxmi Crop Science Private Lim-ited, Gujarat	12.03.2025	11.03.2030	DMRH 1308	4.00
4	Sworn Agritech Private Limited, Mad-hya Pradesh	19.02.2025	18.02.2030	DMRH 1308	4.00
5	B.T. Agrotech Private Ltd., Bihar	02.06.2025	01.06.2030	DMRH 1308	6.00
6	Agrowin Agri Solution Pvt. Ltd., Bihar	02.06.2025	01.06.2030	DMRH 1308	6.00
7	Bharatiya Beej Sahakari Samiti Ltd, New Delhi	15.07.2025	14.07.2030	DMRH 1308	5.40
8	Ashoka Agtech Pvt Ltd, Bihar	16.07.2025	15.07.2030	DMRH 1308	2.00
9	Star Agriseeds Pvt Lyd, Rajasthan	31.07.2025	30.07.2030	DMRH 1308	6.00
10	Chakra Seeds, Andhra Pradesh	03.09.2025	02.09.2030	DMRH 1308	6.00
11	Sunita Krishi Seeds, MP	07.10.2025	06.10.2030	DMRH 1308	6.00
12	Karanavati Seeds, Gujarat	08.10.2025	07.10.2030	DMRH 1308	6.00
13	Solar Seeds, Bengaluru	19.11.2025	18.11.2030	LPCH 3	4.00
14	Ashoka Agtech Pvt Ltd, Bihar	16.07.2025	15.07.2030	LQMH 1	2.00
15	Sri Laxmivenkateshwara Seeds, Kur-nool	11.10.2025	10.10.2030	IQMH 203	4.00
16	Krishi Vikas Sahakari Samiti Ltd., Rajasthan	31.03.2025	30.03.2030	IMH 224	6.00
17	Chakra Seeds, Andhra Pradesh	29.09.2025	28.09.2030	IMH 224	6.00
18	Chakra Seeds, Andhra Pradesh	29.09.2025	28.09.2030	IMH 227	6.00
19	Agrowin Agri Solution Pvt. Ltd., Bihar	02.06.2025	01.06.2030	IMH 228	6.00
20	Chakra Seeds, Andhra Pradesh	29.09.2025	28.09.2030	IMH 228	6.00
21	Basudha Seeds, West Bengal	11.10.2025	10.10.2030	IMH 229	4.00
22	Dadabhai Seed Farm, West Bengal	10.11.2025	09.11.2030	IMH 229	4.00
23	Krishi Vikas Sahakari Samiti Ltd., Rajasthan	23.09.2025	24.09.2030	IMH 231	6.00
Total					**113.80**

ANNEXURE-III

List of Extant (VCK) Category entries under DUS testing during 2025, Ludhiana (Kharif)

S.No	Name of Entry	Testing Year	Type	Single Cross Hybrid (SCH) / Inbred
1	SYN-CO-NK 7660	First Year	Extant (VCK)	SCH
2	SYN-CO-NK 6240 CMS	First Year	Extant (VCK)	SCH
3	SYN-CO-NK 6802	First Year	Extant (VCK)	SCH
4	SYN-CO-NK-6540	First Year	Extant (VCK)	SCH
5	SYN-CO-TA 6214	First Year	Extant (VCK)	SCH
6	SYN-CO-TA 5084	First Year	Extant (VCK)	SCH
7	SYN-CO- NK 6110	First Year	Extant (VCK)	SCH
8	SYN-CO-NK 6514	First Year	Extant (VCK)	SCH
9	SYN-CO-NK 7884	First Year	Extant (VCK)	SCH
10	DKC9233	First Year	Extant (VCK)	SCH
11	DKC7240	First Year	Extant (VCK)	SCH
12	DKC8174	First Year	Extant (VCK)	SCH
13	KMH8335	First Year	Extant (VCK)	SCH
14	KMH8111	First Year	Extant (VCK)	SCH
15	KMH8116	First Year	Extant (VCK)	SCH
16	KMH8338	First Year	Extant (VCK)	SCH
17	KMH8339	First Year	Extant (VCK)	SCH
18	SYN-CO-NPE0018	First Year	Extant (VCK)	Inbred
19	SYN-CO-NP5814	First Year	Extant (VCK)	Inbred
20	SYN-CO-NP5353	First Year	Extant (VCK)	Inbred
21	SYN-CO-NP5645	First Year	Extant (VCK)	Inbred
22	SYN-CO-NP5918	First Year	Extant (VCK)	Inbred
23	SYN-CO-NP5940	First Year	Extant (VCK)	Inbred
24	SYN-CO-NPE0028	First Year	Extant (VCK)	Inbred
25	SYN-CO-QMYFE418	First Year	Extant (VCK)	Inbred
26	SYN-CO-NP5634	First Year	Extant (VCK)	Inbred
27	SYN-CO-NP5272	First Year	Extant (VCK)	Inbred
28	SYN-CO-NP5927	First Year	Extant (VCK)	Inbred
29	SYN-CO-NP5388	First Year	Extant (VCK)	Inbred
30	SYN-CO-NP 5383	First Year	Extant (VCK)	Inbred
31	SYN-CO-NP5416	First Year	Extant (VCK)	Inbred
32	SYN-CO-NP5384	First Year	Extant (VCK)	Inbred
33	SYN-CO-NP2405	First Year	Extant (VCK)	Inbred
34	KM20SX023	First Year	Extant (VCK)	Inbred
35	KM20SX021	First Year	Extant (VCK)	Inbred
36	KM20SX022	First Year	Extant (VCK)	Inbred

37	SYN-CO-NPE0126	First Year	Extant (VCK)	Inbred
38	SYN-CO-NP5387	First Year	Extant (VCK)	Inbred
39	SYN-CO-NP5935	First Year	Extant (VCK)	Inbred
40	SYN-CO-NPF0043	First Year	Extant (VCK)	Inbred
41	KM24SY074	First Year	Extant (VCK)	Inbred
42	BZ388-nm	First Year	Extant (VCK)	Inbred

List of Extant (VCK) New Category candidate hybrids

S.No	Name of entry	Testing year	Type	Single Cross Hybrid (SCH) / Inbred
1	TMMH 2861	First Year	New	SCH
2	TMMH 8805	First Year	New	SCH
3	NMH-8448	First Year	New	SCH
4	NMH-8449	First Year	New	SCH
5	NMH-8413	First Year	New	SCH
6	NMH-4624	First Year	New	SCH
7	NMH-4519	First Year	New	SCH
8	NMH-4754	First Year	New	SCH
9	DKC9248	First Year	New	SCH
10	EAGLE-1501	First Year	New	SCH
11	EAGLE-21	First Year	New	SCH
12	TMMH 8833	First Year	New	SCH
13	TMMH 8457	First Year	New	SCH
14	SYN-CO-NK 7806	First Year	New	SCH
15	SYN-CO-NK 7704	First Year	New	SCH
16	SYN-CO-NK 6604	First Year	New	SCH
17	SYN-CO-NK 7804	First Year	New	SCH
18	SYN-CO-NK 7602	First Year	New	SCH
19	SYN-CO-S 6305	First Year	New	SCH
20	MM 2323	First Year	New	SCH
21	TMMH 8108	First Year	New	SCH
22	9243C	First Year	New	SCH
23	DKC8272	First Year	New	SCH
24	DKC9256	First Year	New	SCH
25	MM 2525	First Year	New	SCH
26	MM 2060	First Year	New	SCH
27	MM 2626	First Year	New	SCH
28	DKC9255	First Year	New	SCH
29	DKC9247	First Year	New	SCH
30	TMMH 8135	First Year	New	SCH
31	P35506	First Year	New	SCH
32	P33307	First Year	New	SCH
33	P33905	First Year	New	SCH
34	P35509	First Year	New	SCH

35	NM 832	First Year	New	Inbred
36	1PDFU69	First Year	New	Inbred
37	1PLQS54	First Year	New	Inbred
38	1PQKF31	First Year	New	Inbred
39	PH20F3	First Year	New	Inbred
40	NM 835	First Year	New	Inbred
41	NM 826	First Year	New	Inbred
42	1PHTT38	First Year	New	Inbred
43	NM 825	First Year	New	Inbred
44	NM-388	First Year	New	Inbred
45	NM-142	First Year	New	Inbred
46	NM-565	First Year	New	Inbred
47	NM-1491	First Year	New	Inbred
48	NM-1434	First Year	New	Inbred
49	SYN-CO-NP5418	First Year	New	Inbred
50	SYN-CO-FX7012	First Year	New	Inbred
51	SYN-CO-NP5934	First Year	New	Inbred
52	SYN-CO-NP5643	First Year	New	Inbred
53	SYN-CO-FFX7458	First Year	New	Inbred
54	SYN-CO-NPE0122	First Year	New	Inbred
55	SYN-CO-NPF0054	First Year	New	Inbred
56	M202659	First Year	New	Inbred
57	BCGP 6078	First Year	New	Inbred
58	BCGP 6272	First Year	New	Inbred
59	BCGP 6234	First Year	New	Inbred
60	BCGP 6077	First Year	New	Inbred
61	BCGP 6168	First Year	New	Inbred
62	BCGP 6004	First Year	New	Inbred
63	BCGP 6395	First Year	New	Inbred
64	IN-WW642	First Year	New	Inbred
65	TH-SYA21408	First Year	New	Inbred
66	BIY-02	First Year	New	Inbred
67	BZ384-nm	First Year	New	Inbred
68	M201587	First Year	New	Inbred
69	M204533	First Year	New	Inbred
70	M204430	First Year	New	Inbred

List of Extant (VCK) New Category (second year) candidate hybrids

S.No	Name of entry	Testing year	Type	Single Cross Hybrid (SCH)
1	ELLORA COMMANDO 1112	Second Year	New	SCH
2	DKC9228	Second Year	New	SCH
3	TMMH 8418	Second Year	New	SCH
4	P34104	Second Year	New	SCH

5	P34407	Second Year	New	SCH
6	P35105	Second Year	New	SCH

List of farmer's varieties (FV) Catogery hybrids

S.No	Name of entry	Testing year	Type	Farmer varieties
1	Pili Makka Satyendra	First Year	Farmer	Farmer varieties
2	Seori Makka Heera	First Year	Farmer	Farmer varieties
3	Biran Makka	First Year	Farmer	Farmer varieties
4	Makka Pillo Khamera Amar	First Year	Farmer	Farmer varieties
5	Pilloo Ranjit Makka	First Year	Farmer	Farmer varieties
6	Makka Pila Lahaiya	First Year	Farmer	Farmer varieties
7	Bhadeli Kashi	First Year	Farmer	Farmer varieties
8	Gendlal Makai	First Year	Farmer	Farmer varieties
9	Lal Makka	First Year	Farmer	Farmer varieties
10	Vati Makka	First Year	Farmer	Farmer varieties
11	Bhalavi Makka	First Year	Farmer	Farmer varieties
12	Rag Bharti Makka	First Year	Farmer	Farmer varieties
13	Makka Ishwar	First Year	Farmer	Farmer varieties
14	Makai Indar	First Year	Farmer	Farmer varieties
15	Makka Jith	First Year	Farmer	Farmer varieties
16	Makki Devi	First Year	Farmer	Farmer varieties
17	Supariya Makka	First Year	Farmer	Farmer varieties
18	Dhana Laxman Makka	First Year	Farmer	Farmer varieties
19	Dhana Saj Mamta Makka	First Year	Farmer	Farmer varieties
20	Maharsi Makka	First Year	Farmer	Farmer varieties
21	Jayvati Makka	First Year	Farmer	Farmer varieties
22	Khemchand Makka	First Year	Farmer	Farmer varieties
23	Leema Jait Makka	First Year	Farmer	Farmer varieties
24	Nirbati Makka	First Year	Farmer	Farmer varieties
25	Ganeshi Makka	First Year	Farmer	Farmer varieties
26	Shankar Makka	First Year	Farmer	Farmer varieties
27	Vranda Makka	First Year	Farmer	Farmer varieties
28	Meena Makka	First Year	Farmer	Farmer varieties
29	Chhindwala Makka	First Year	Farmer	Farmer varieties
30	Sathi Makka	First Year	Farmer	Farmer varieties
31	Hemant Makka	First Year	Farmer	Farmer varieties
32	Sunpuri Makka Peela	First Year	Farmer	Farmer varieties
33	Peela Makka Mohgaon	First Year	Farmer	Farmer varieties
34	Kishori Makka	First Year	Farmer	Farmer varieties
35	Kislai Makka 1	First Year	Farmer	Farmer varieties
36	Ramesh Makka	First Year	Farmer	Farmer varieties
37	Pyari Makka	First Year	Farmer	Farmer varieties
38	Ramgopal Makka	First Year	Farmer	Farmer varieties
39	Safed Makki Heeralal	First Year	Farmer	Farmer varieties

40	Khamera Makka Phool	First Year	Farmer	Farmer varieties
41	Makka Jale Safeda	First Year	Farmer	Farmer varieties
42	Bhadeli	First Year	Farmer	Farmer varieties
43	Makki Dewarth	First Year	Farmer	Farmer varieties
44	Makka Keshar	First Year	Farmer	Farmer varieties
45	Makka Khobadi	First Year	Farmer	Farmer varieties
46	Kushwaha Makai	First Year	Farmer	Farmer varieties
47	Kuriya Makka	First Year	Farmer	Farmer varieties
48	Siliya Makka	First Year	Farmer	Farmer varieties
49	Dulari Makka	First Year	Farmer	Farmer varieties
50	Dhoodh Mogra Safed Sukhram	First Year	Farmer	Farmer varieties
51	BhadeliPeeli Aday	First Year	Farmer	Farmer varieties
52	Hansa	First Year	Farmer	Farmer varieties
53	AH-M	First Year	Farmer	Farmer varieties
54	PLANDRI	First Year	Farmer	Farmer varieties
55	Tanra Makai	First Year	Farmer	Farmer varieties
56	PIVALA LAL MAKKA	First Year	Farmer	Farmer varieties
57	PIVALA LAHAN MAKKA	First Year	Farmer	Farmer varieties
58	PIVALA MAKKA	First Year	Farmer	Farmer varieties
59	KESHRI MAKKA	First Year	Farmer	Farmer varieties
60	KUKKUD MAKKA	First Year	Farmer	Farmer varieties
61	MOG DANA	First Year	Farmer	Farmer varieties
62	JISULAL MAKAI	First Year	Farmer	Farmer varieties

List of farmer's varieties category for DUS characterization & seed multipication

S.No	Name of entry	Testing year	Type	Farmer varieties
1	BARU TENDA	First Year	Farmer	Farmer varieties
2	JAUNASARI TENTA	First Year	Farmer	Farmer varieties
3	KALSI TENTA	First Year	Farmer	Farmer varieties
4	TAARLI TENTA	First Year	Farmer	Farmer varieties
5	MAHASU MAKKA	First Year	Farmer	Farmer varieties
6	BADO TENTA	First Year	Farmer	Farmer varieties
7	MINI TENTA	First Year	Farmer	Farmer varieties
8	CHAMBAD MAKKA	First Year	Farmer	Farmer varieties
9	SAINJ TENDA	First Year	Farmer	Farmer varieties
10	DUNGRI TENTA	First Year	Farmer	Farmer varieties
11	SAMALTHA KUKDI	First Year	Farmer	Farmer varieties
12	MANPA SHONGTAH	First Year	Farmer	Farmer varieties
13	OM-MAIZE	First Year	Farmer	Farmer varieties
14	SHARAD-MAIZE	First Year	Farmer	Farmer varieties
15	PRATHU-MAIZE	First Year	Farmer	Farmer varieties
16	SHWET-MAIZE	First Year	Farmer	Farmer varieties

*Note*** During kharif 2025 at Ludhiana, a total of 120 reference entries were evaluated, comprising 66 hybrids and 54 inbred lines.*

ANNEXURE-IV

Breeder seed production (BSP-IV) Year-wise total breeder seeds* produced and supplied (kg) for different hybrids of the Institute. The quantity supplied includes the total demand received (through DAC+ direct demand to the institute) from various states and national seeds producing agencies.

Particular	**Year wise breeder seeds produced and supplied (kg)**							
Parents of hybrids	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**Total**
Female of DMRH 1301 & 1308 (BML 6)	1110.0	188.0	2212.0	5542.0	4085.0	6157	3818	23112
Male of DMRH 1301 (IML 418-1)	295.0	60.0	725.0	200.0	385.0	183	200	2048
Male of DMRH 1308 (HKI 163)	-	-	429.0	1895.0	2069.0	2415	2800	9608
Female of DMRH 1305 (V 373)	-	20.0	40.0	-	-	-	-	60
Male of DMRH 1305 (HKI 1105)	-	10.0	20.0	-	-	-	-	30
Female of LQMH 1 (IML343-1)	-	-	-	30.0	45.0	-	-	75
Male of LQMH 1 (HKI 163)	-	-	-	15.0	15.0	-	-	30
Female of IMHB 1539 (HKI 1105)	-	-	10.0	-	-	-	-	10
Male of IMHB 1539 (IML 127-1)	-	-	5.0	-	-	-	-	5
Female of LPCH 3 (Dpcl 15-90)	-	-	-	5.0	-	-	-	5
Male of LPCH 3 (Dpcl 117)	-	-	-	2.5	-	-	-	2.5
Female of IMHB 1532 (IML 127-1)	-	-	30.0	-	-	-	-	30
Male of IMHB 1532 (IML 242-1)	-	-	10.0	-	-	-	-	10
Female of IQMH 203 (DQL 2209)	-	-	-	20	-	32	400	452
Male of IQMH 203 (DMRQPM 106)	-	-	-	10	-	30	20	60
Female of IQMH 208							10	10
Male of IQMH 208							48	48
Female of IMH 222 (IML14)							490	490
Female of IMH 223 (IML15)							590	590
Male of IMH 222 & 223 (BML 7)							35	35
Female of IMH 224 (IML 22)	-	-	-	-	-	0.5	30	30.5
Male of IMH 224 (IML 16)	-	-	-	-	-	0.5	15	15.5
Female of IMH 227 (IML 24)							250	250
Male of IMH 227 (BML 6)							105	105
Grand total	**1405**	**278**	**3481**	**7719.5**	**6599**	**8818**	**8703**	**37033.5**

ANNEXURE-V

Sr. No.	Name of the Scientist	Title		
Lectures			**Place**	**Date**
1.	**Dr. Shankar Lal Jat**	Influence of abiotic stresses in maize in different agroecologies, Winter school on "Climate Smart Maize Agriculture for Food and Energy Security in India" 5-25 March, 2025	Ludhiana	06.03.2025
		Kharif maize production technology CIMMYT CAMSA Project	ICRISAT Hyderabad	08.05.2025
		Conservation Agricultural Practices for Improving Crop Productivity Training on Sustainable Farming Practices for Dealers/Retailers and Farmers of Punjab by FAI	IFFCO Bhawan, Chandigarh	19.05.2025
		Kharif maize production technology in Rajasthan Training of trainers at Directorate of Extension, MPUAT, Udaipur	Google Meet online	20.05.2025
		Maize cultivation: scientific ways for yield maximization Training on maize led diversification: Pathways for sustainable agriculture in Odisha, 19-21 May, 2025 at Ludhiana	Zoom online platform	20.05.2025
2.	**Dr. P. Lakshmi Soujanya**	Integrated pest management in maize for Awareness programme cum exposure visit for farmers/ kisan salakhar of Lakheesarai during three days training programme on Climate smart maize production technologies for farmers at RMRSPC, Begusarai from 11.2.2025 to 14.2.2025.	Virtual	14.2.2025
		Integrated pest management in maize for master training programme on Value addition in maize and entrepreneurship development on 18.2.2025 at RMR&SP, Bihar.	Virtual	18.2.2025
		Integrated pest management in maize under BAMETI training from 2.3.2025 to 4.3.2025 at RMR&SP, Bihar	Virtual	3.3.2025
		Integrated pest management in maize during Winter School on "Climate Smart Maize Agriculture for Food and Energy Security in India from March 5–25, 2025 , at ICAR-IIMR & CIPHET, Ludhiana.	Virtual	10.3.2025
		"Maize insect pests and their management" and recording of data in Entomology trials during 3 days training programme on "Training of staff of AICRP on Maize" held from 11th to 13th August, 2025 organised by ICAR-IIMR at Ludhiana.	Virtual	11.8.2025
		Integrated pest management in maize for Awareness programme cum exposure visit for farmers/ kisan salakhar of Lakheesarai during three days training programme on Climate smart maize production technologies for farmers at RMRSPC, Begusarai from 11.2.2025 to 14.2.2025.	Virtual	14.2.2025

		Integrated pest management in maize for master training programme on Value addition in maize and entrepreneurship development on 18.2.2025 at RMR&SP, Bihar.	Virtual	18.2.2025
4.	**Dr. S. B. Singh**	Development of climate smart stress tolerant maize cultivars for enhancing rainfed maize productivity in the 21 days Winter School on "Climate Smart Maize Agriculture for Food and Energy Security in India organized by ICAR-IIMR, Ludhiana and ICAR-CIPHET, Ludhiana, from March 5–25, 2025, at ICAR-IIMR & CI-PHET, Ludhiana.	ICAR-CIPHET, Ludhiana	07.03.2025
		Maize crop scenario at national level and Special discussion in perspective of UP farmer on opportunities in rabi maize delivered in State level workshop and exhibition on maize organized by the Ministry of Agriculture and Farmer's Welfare Government of UP.	Hotel Hyatt Regency, Lucknow	19.02.2025
		Data recording in field corn AICRP trials in three days training programme for Scientists/Technical Staff of AICRP centers	ICAR-IIMR, Ludhiana	12.08.2025
		Farmer participatory hybrid seed production delivered in the one-day Awareness Program cum Exposure Visit for Farmers/Kissan Salahkar organized	RMR&SPC Begusarai, Bihar	14.02.2025
		Climate resilient and High Yielding Maize varieties delivered on for Uttar Pradesh in three days (26-02-2025 to 28-02-2025) Master Training Program for Extension agents & Farmers of Uttar Pradesh	RMR&SPC Begusarai, Bihar	28.02.2025
		Climate Resilient and High Yielding Maize Varieties for Bihar delivered in the three days 06-(03-2025 to 08-03-2025) Master Training Program for Para- Extension Agents (FPOs, PACS, NGO etc.) of Bihar	RMR&SPC Begusarai, Bihar	06.03.2025
		High Yielding Single Cross ICAR Hybrids to Cater the Bio-ethanol Demand in Bihar delivered in the one day Workshop for Stakeholders (Researchers, Executives, Farmers & Industry Partners) at organized by RMR&SPC, Begusarai	BAMETI, Patna	19.03.2025
		Hybrid seeds production technologies for enhancing farmers income delivered on in three days (March 24-27, 2025) training program on Scientific Maize Management for Maximizing Productivity and Profit in Bihar" organized	ICAR-IIMR, Ludhiana	25.03.2025
		Improved Maize Varieties for Bihar delivered in the three days Master Training Program for farmers of Orissa on Sustainable Maize Cultivation for Diversifying Cropping System and Securing Rural Livelihood	ICAR-IIMR, Ludhiana	08.09.2025
5.	**Dr. Chander Mohan**	Understanding SATHI Portal	CAU, Imphal	19.12.2025
		Principles and Practices of Seed Production	KVK, Begusarai, Bihar	05.12.2025
		Discussion of Draft Seed Bill: Provisions & Implications	RPCAU, Pusa, Samastipur, Bihar	04.12.2025
		Types of Seeds	KVK, Begusarai, Bihar	28.11.2025

		Difference between Seeds & Grains. Importance of quality seeds in crop production, seed treatment-importance and procedure.	KVK, Begusarai, Bihar	20.11.2025
		Seed selection and imparting knowledge of new varieties in pop-corn	ATMA, Begusarai, Bihar	17.10.2025
		Maize Hybrid Seed Production	ATMA, Begusarai, Bihar	15.10.2025
		Types of Seeds	KVK, Begusarai, Bihar	10.10.2025
		Basic Business Skills for Seed Dealers	KVK, Begusarai, Bihar	10.10.2025
		Policy Landscape and government Support for Bio-fortification	MANAGE, Hyderabad	02.09.2025
		Policy Landscape and government Support for Bio-fortification	MANAGE, Hyderabad	17.07.2025
6.	**Dr. N Sunil**	AICMIP: Online automation system an Overview in the training programme titled "Organized conduct, data recording and data uploading of AICRP trials"	ICAR-IIMR, Ludhiana	12.08.25
7.	**Dr. Abhijit Das**	Delivered lecture on "Molecular breeding for biochemical traits in maize" during Winter School on "Climate Smart Maize Agriculture for Food and Energy Security in India.	ICAR-IIMR, Ludhiana	05.03.2025 to 25.03.2025
8.	**Dr. Mukesh Choudhary**	Invited Lecture on "Navigating genomic selection for improving crop breeding efficiency" on March 25, 2025 in Winter School on "Climate Smart Maize Agriculture for Food and Energy Security in India." Sponsored by the Agricultural Education Division, ICAR, New Delhi	ICAR-IIMR & CIPHET, Ludhiana.	05.03.2025 to 25.03.2025
		Invited Lecture on "Promotion of Climate Resilient Interventions" on 29th April 2025 in online training programme on 'Ensuring food security in changing climate scenario' organized by College of Agriculture, Nagaur, Agriculture University, Jodhpur, Rajasthan, India and MANAGE	College of Agriculture, Nagaur, Agriculture University, Jodhpur, Rajasthan, India	28.04.2025 to 30.04.2025
		Delivered a lecture on "Maize as Feed, Forage, Silage with hi-tech technologies for small scale business model" in Training on "Scientific Maize Management for Maximizing Productivity and Profit in Bihar" from March 24-27, 2025 at PAMETI, Ludhiana	PAMETI, Ludhiana	24.03.2025 to 27.03.2025
		Delivered a lecture on "Maize as Feed, Forage, Silage with hi-tech technologies for small scale business model" in Training on "Maize Led Crop Diversification: Pathways for Sustainable Agriculture in Odisha" from May 19-21, 2025 at PAMETI, Ludhiana	Begusarai, Bihar	18-02-2025 to 20-02-2025
		Delivered a lecture on "Farmers Participatory Maize Hybrid Seed Production in Bihar" in 3 days Training programme on "Value addition of Maize & Entrepreneurship development" organized by ICAR-IIMR, RMRSPC, Begusarai, Bihar	ICAR-IIMR, RMRSPC, Begusarai, Bihar	18-02-2025 to 20-02-2025

		Training attended- 5 days training course on "Fundamentals of Genomic Predictions and Data-Driven Crop Breeding" from November 24-28, 2025 at ICAR–Indian Institute of Rice Research (ICAR-IIRR), Rajendranagar, Hyderabad, Telangana, India		
10.	**Dr. Seema Sepat**	Delivered lecture in Best management practices in maize production and technologies organised by three day training programme for farmer Kissan Salaskar	Regional maize research and seed production centre Begusarai, Bihar	6.1.2026 to 8.1.2026
11.	**Dr. Alok Sahoo**	Agri-business skills and ICT tools for Maize based Entrepreneurship, Value addition of Maize & Entrepreneurship development	RMRSPC Begusarai	18 to 20 February 2025
		Role of Group dynamics such as FPO, SHG in Maize value chain prospects, Value addition of Maize & Entrepreneurship development	RMRSPC Begusarai	18 to 20 February 2025
		Agri-business skills and ICT tools for bridging yield gap in Maize in UP, Best management practices in Maize for value addition and bio-ethanol production in Uttarpradesh	RMRSPC Begusarai	26 to 28 February 2025
		Role of Group dynamics such as FPO, SHG in Maize value chain prospects, Best management practices in Maize for value addition and bio-ethanol production in Uttarpradesh	RMRSPC Begusarai	26 to 28 February 2025
		Agri-business skills and ICT tools for Maize based entrepreneurship, Maize based Entrepreneurship development	RMRSPC Begusarai	02 to 04 March 2025
		Role of Group dynamics such as FPO, SHG in Maize value chain prospects, Maize based Entrepreneurship development	RMRSPC Begusarai	02 to 04 March 2025
		Role of Group dynamics such as FPO, SHG in Maize value chain prospects, Best management practices in Maize for profitable bio-ethanol production in Bihar	RMRSPC Begusarai	06 to 08 March 2025
		Agri-business skills and ICT tools for bridging yield gap in Maize in Bihar, Best management practices in Maize for profitable bio-ethanol production in Bihar	RMRSPC Begusarai	06 to 08 March 2025
		Training attended- 5 Days training course on "Direct Training Skills (DTS-14)"	Institute of Secretariat & Training Management (ISTM), New Delhi	18.08.2025 to 22.08.2025
13.	**Dr. Yathish K.R.**	Guest lecture on "Maize Varietal Technologies" for FPO members from Maharashtra undergoing training,	ICAR-IIRR under the World Bank sponsored SMART training program	March 20, 2025
		Guest lecture on "Hybrid Seed Production in Maize : Types of Breeding Programs for Varieties Improvement in Three Days Master Training Program for Para- Extension Agents (FPOs, PACS, NGO etc.) of Bihar,	Regional Maize Research & Seed Production Centre, Begusarai, Bihar	06 to 08 March 2025

14.	**Dr. S.D. Bamboriya**	Crop diversification through maize during farmer's training on ''Sustainable maize cultivation for diversifying cropping systems and securing rural livelihoods''	IIMR, Ludhiana	08/09/2025
		Crop diversification through maize during farmer's training on ''Sustainable maize cultivation for diversifying cropping systems and securing rural livelihoods''	IIMR, Ludhiana	15/10/2025
15.	**Dr. Suby SB**	*Lead lecture:* 'Transforming maize pest management in India: emerging trends and future directions'- Advances in Sustainable Plant Protection under Changing Agriculture Scenario"	Entomological Research Association, Rajasthan College of Agriculture, MPUAT, Udaipur	18-20 September 2025
		Expert lectures:"Integrated Pest Disease Management in Maize in Bihar " (Hindi) in awareness programme on " Awareness Program cum Exposure Visit of Lakheesarai farmers/Kissan Salahkars on "Scientific Maize cultivation and post-harvest management"	ICAR-IIMR, RMR-SPC, Begusarai, Bihar	11-02-2025
		"Integrated Pest Management in Maize" (Hindi) in one day Training programme on "Scientific Maize Cultivation for Improving Productivity"	ICAR-IIMR, RMR-SPC, Begusarai, Bihar	25-02-2025
		"Best production practices in Maize" (Malayalam) in Awareness Campaign under Enhancement of Maize Production in Catchment areas of Ethanol Industries on Maize Vagarai	ICAR-IIMR, and AICRP, ICAR - Krishi Vigyan Kendra, Mitraniketan in Trivandrum, Kerala	28-02-2025
		"Integrated Pest Management in Maize" (Tamil) in Awareness Campaign under Enhancement of Maize Production in Catchment areas of Ethanol Industries ICAR-IIMR, AICRP on Maize Vagarai	Ottudanpatti village hall, Thoothukudi district, Tamil Nadu	01-03-2025
		"FAW & Integrated Pest Management in Maize" (Hindi) on one day in the two days Awareness cum exposure visit programme organized by ICAR-IIMR, RMRSPC, Begusarai, Bihar	sponsored by ICAR-IARI Jharkhand	04-03-2025 to 05-03-2025
		"Integrated Pest Disease Management in Maize" in training program on maize technology for Odisha Rural Development and Marketing Society (ORMAS)	R.Udayagiri, Odisha	15-4-2025
		"Integrated Pest Disease Management in Maize" in training program on maize technology for Odisha Rural Development and Marketing Society (ORMAS) at "Integrated Pest Disease Management in Maize" in training program on maize technology for Odisha Rural Development and Marketing Society	ORMAS Mohana, Odisha	16-4-2025

16.	**Dr Pardeep-Kumar**	Delivered a lecture on “Speciality corn cultivation for enhancing farmers income” in Training on “Sustainable Maize Cultivation for Diversifying Cropping Systems and Securing Rural Livelihoods"	ICAR-IIMR, Ludhiana	October 16-18, 2025
		Post-Harvest Management and Value Addition of Maiz under Scheduled Caste Sub Plan (SCSP)	ICAR-CIPHET, Ludhiana	October 4-7, 2025
		Delivered a lecture on “Speciality corn cultivation for enhancing farmers income” in Training on “Sustainable Maize Cultivation for Diversifying Cropping Systems and Securing Rural Livelihoods"	ICAR-IIMR, Ludhiana	September 8-10, 2025
		Delivered a lecture on “Speciality corn cultivation for enhancing farmers income” in Training on “Maize-Led Crop Diversification: Pathways for Sustainable Agriculture in Odisha"	ICAR-IIMR, Ludhiana (PAMETI)	May, 19-21, 2025
		Delivered a lecture on “Maize as Forage and Fodder crops and maize use in Silage” in training on “Best Management Practices in Maize for value addition and bio- ethanol Production in Uttar Pradesh”	RMR & SPC	February, 26-28, 2025
		Delivered a lecture on “Maize as Feed, Forage, Silage with hi-tech technologies for small scale business model” in training on “Maize based Entrepreneurship development”	RMR & SPC	March, 02-04, 2025
		Delivered a lecture on “Maize as Forage and Fodder Crops and Maize Use in Silage & Hydroponics Fodder Agri-enterprise” in training on ““Best Management Practices in Maize for Profitable Bio-	RMR & SPC	March, 06-08, 2025
		Delivered a lecture on “Maize as Forage and Fodder crops and maize way forward ” Winter School on “Climate Smart Maize Agriculture for Food and Energy Security in India.” Sponsored by the Agricultural Education Division, ICAR, New Delhi, from March 5–25, 2025, at ICAR-IIMR & CIPHET, Ludhiana.	RMR & SPC	February, 18-20, 2025
		Delivered a keynote lecture on “Strategies for Improving the Availability of Baby Corn for Conventional and Export Market” in session – V: Bio-prospecting of Indigenous and Underutilized Horticultural Crops: In 11th Indian Horticulture Congress and International Meet-2025 from 06-09th November, 2025 at Bengaluru, India	UAS, Bengaluru	November, 8 2025
		Delivered a lecture on “Development and improvement of maize germplasm for silage specific hybrids” in one day Workshop cum training on strengthening the maize silage value chain in Punjab & Haryana	ICAR-IIMR, Ludhiana	October, 06 2025

17	**Deep Mohan Mahala**	Nutrient management for higher yield in maize	Scientific Maize Management for Maximizing Productivity and Profit in Bihar	March 24–27, 2025
		Nutrient management for higher yield in maize	Training on Maize-led Crop Diversification: Pathways for Sustainable Crop Production in Odisha	May 19–21, 2025
		Demonstration of Drone	Empowering Field Implementation for Maize-based Bioethanol and Catchment Development	July 23–25, 2025
18	**Deep Mohan Mahala**	Integrated nutrient management in maize	Village Alipur, Bhuner Heri Block, Patiala District, Punjab	01 August 2025
		Integrated nutrient management in maize	Village Hadana, Bhuner Heri Block, Patiala District, Punjab	01 August 2025
		INM, precision agriculture and conservation agriculture in maize	Village Kanjhla, Dhuri Block, Sangrur District, Punjab	04 August 2025
		INM, precision agriculture and conservation agriculture in maize	Village Qila Hakima, Andana Block, Sangrur District, Punjab	04 August 2025
		INM, precision agriculture and conservation agriculture in maize	Village Bhojowali, Bhawanigarh Block, Sangrur District, Punjab	06 August 2025
		INM, precision agriculture and conservation agriculture in maize	Village Bhalwan, Bhawanigarh Block, Sangrur District, Punjab	06 August 2025
		INM, precision agriculture and conservation agriculture in maize	Village Chajla, Bhawanigarh Block, Sangrur District, Punjab	12 August 2025
		INM, precision agriculture and conservation agriculture in maize	Village Gobindgarh, Andana Block, Sangrur District, Punjab	12 August 2025
		Drone and mechanisation hands-on training experience	Training for Staff of AICRP on Maize	August 11–13, 2025
		Frontline Demonstration on Drone Technology in Maize Cultivation	Training on Sustainable Maize Cultivation for Diversifying Cropping Systems and Securing Rural Livelihoods	September 8–10, 2025

19	**Drs. A.K. Singh, M.C. Dagla, Romen Sharma, P.K. Bagaria, Deep Mohan Mahala**	Hands-on Training: Mechanisation, IPM, IDM, INM, Cropping System Modules, etc.	Training on Sustainable Maize Cultivation for Diversifying Cropping Systems and Securing Rural Livelihoods	September 8–10, 2025
20	**Drs. Deep Mohan Mahala**	Frontline Demonstration on Drone Technology in Maize Cultivation	Training on Sustainable Maize Cultivation for Diversifying Cropping Systems and Securing Rural Livelihoods for Farmers of Boudh District, Odisha	October 16–18, 2025
21	**Dr. Krishan Kumar**	Invited lecture on 'Genome editing for genetic improvement of maize' during Winter School on "Climate Smart Maize Agriculture for Food and Energy Security in India." Sponsored by the Agricultural Education Division, ICAR, New Delhi, from March 5–25, 2025.	ICAR-IIMR & CIPHET, Ludhiana.	March 19, 2025
		Deliver a lead lecture on "Prospects of genetically engineered and gene-edited maize" Brainstorming workshop on "Biotech intervention in Maize : Challenges and Opportunities"	IIMR Ludhiana	1 September 2025
TV Talks				
1.	**Dr. C.Mohan**	Vichar Vimarsh https://youtu.be/uIgQX-qqCUhw?si=kCk9SqMfaB52QpfA	DD Kisan, Delhi	15-02-2025
		Vichar Vimarsh https://www.youtube.com/watch?v=ssHf22cdjik	DD Kisan, Delhi	01-03-2025
		Vichar Vimarsh https://youtu.be/YFUze0QbJsA	DD Kisan, Delhi	29-03-2025
		Sarkar Aapke Saath https://youtu.be/P3Cp1FOaJII?si=nREI75-vcN-84mQDO	DD Kisan, Delhi	05-04-2025
		Vichar Vimarsh https://youtu.be/PE-F_115OE3k?si=8vMAVYrZELrJYBiz	DD Kisan, Delhi	26-04-2025
		Sarkar Aapke Saath https://youtu.be/Kyd6KBNbhQI?si=JacoLacvkm-J_4wId	DD Kisan, Delhi	10-05-2025
		Hello Kisan https://youtu.be/VyPt6hKWik-w?si=I8cZ7m6bcGN3fafa	DD Kisan, Delhi	16-06-2025
2.	**Dr. Seema Sepat**	Tv programme on sowing varieties of Rabi maize in hello Kissan dated		12/11/2025

3.	**Dr. Shankar Lal Jat**	बसंतकालीन मक्का की खेती कृ हेलो किसान लाइव कार्यक्रम	डी डी किसान	23 अप्रैल, 2025
		Maize to ethanol, YEH HAI INDIA	DD Urdu	9th दिसंबर, 2025
		मक्का, APNA COMODITY EXPERT	डी डी किसान	18 जुलाई, 2025
Radio Talks				
1.	**Dr. Shankar Lal Jat**	खरीफ कालीन मक्का की किस्में एवं बुवाई, किसान की बात कार्यक्रम	एफ एम गोलड	6 जून, 2025
		जायद कालीन मक्का की खेती, किसान की बात कार्यक्रम	एफ एम गोलड	4 अप्रैल, 2025
		रबी मक्का फसल की देखभाल, किसान की बात कार्यक्रम	एफ एम गोलड	6 माच, 2025
		खरीफ कालीन मक्का की किस्में एवं बुवाई, किसान की बात कार्यक्रम	एफ एम गोलड	6 जून, 2025
		गुणवत्तायुक्त मक्का के लिए कटाई उपरांत प्रबंधन, किसान की बात कार्यक्रम	एफ एम गोलड	22 सितम्बर, 2025
2.	**Dr. Alok Sahoo**	Radio talk on “Odisha re Maka Utpadana ra Bhabisyata” in odia dialect at Voice of SOA Community Radio 90.4 FM Station	Bhubaneswar	26 सितम्बर, 2025

ANNEXURE-VI

Publication (2025)

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ANNEXURE-VII

ON-GOING PROJECTS

List of Ongoing Institute Projects

Sr. No.	Project code	Title of Project	PI	Co-PI/CCPI	Project duration
1.	AR:IIMR-R:19:MP-03	Genetic enhancement of maize for the development of high yielding and climate resilient hybrids	Dr. S.B. Singh	Drs M.C. Dagla, Sunil Neelam, Bhupender Kumar, Pardeep Kumar, B.S. Jat, Suby, SB, Krishan Kumar, AK Das, Dr. Ph Romen Sharma, Mukesh Choudhary and H.S. Jat	July 2022 to June 2027
2.	AR:IIMR-R:22:MP-02	Improvement of quality traits in maize for nutritional security and industrial application including feed, starch and bioethanol	Dr. Ramesh Kumar	Drs. Sunil Neelam, Chikkappa GK, LP Soujanya, AK Singh, Bharat Bhushan, P.L. Soujanya, Romen Sharma, Ramesh Kasana (CIPHET) and H.S. Jat	July 2022 to Jun 2027
3.	AR:IIMR-R:22:MP-04	Application of informatics and decision support tools in maize improvement	Dr. Sunil N	ICAR-IIMR (SB Singh, Ramesh Kumar, Pardeep Kumar, Mukesh Choudhary, and H.S. Jat), Dr. A. Dandapani from ICAR-NAARM and Dr. Bhadru, PJTSAU	July 2022 to Jun 2025
4.	AR:IIMR-R:22:MP-05	Genetic improvement of specialty corns (sweet corn, baby corn and popcorn) for livelihood security	Dr. Chikkappa G.K.	Drs. KR Yathish, MC Dagla, SL Jat, Bharat Bhushan and H.S. Jat	July 2022 to Jun 2026
5.	AR:IIMR-R:21:MP-01	Breeding for resistance to major insect pests and diseases in maize	Dr. Yathish K.R.	Drs Pravin K Bagaria, Chikkappa G.K., Soujanya P.L., Suby S.B, Prema U (Dharwad), Mukesh Choudhary, N.K. Singh (Pantnagar) and Mahadevu (Mandya)	July 2021 to Jun 2026
6.	AR:IIMR:19-MP-03-SP-01	Genetic enhancement of white maize for dual purpose	Dr. Abhijit K. Das	Drs. SB Singh, SB Suby and Mamta Gupta, Pravin Kumar Bagaria, Savita Sharma (PAU) and Bharat Bhushan	July 2022 to Jun 2027

7.	AR:IIM-R:22-FP-01	Diversification of genetic base for stress tolerance and fodder traits in maize	Dr. Pardeep Kumar	Drs.SB Singh, Bhupender Kumar, MC Dagla, Yathish KR, BS Jat, Dharam Paul, PL Soujanya, JS Hundal (GADVASU), Shanti Bamboriya and Mukesh Choudhary	July 2022 to Jun 2027
8.	AR:IIM-R:19:MP-03: SP-01	Genetic enhancement of maize germplasm for short duration	Dr. Manesh Chander Dagla	Drs B S Jat, Dr. Mukesh Choudhary, Dr. Soujanya PL and Deep Mohan Mahala	July 2024 to till date
9.	AR:IIM-R:19:MP-03: SP-02	Breeding for high yielding drought tolerant maize germplasm	Dr. BS Jat	Drs Mukesh Choudhary, Chikkappa GK, MC Dagla, SD Bamboriya, Ramesh Kumar, SR Karad (AICRP Kolhapur), SR Dhonde (AICRP Rahuri) and Hargilas (AICRP Banswara)	July 2024 to till date
10.	AR:IIM-R:24:IP-01	Genomic selection for accelerated yield gains in maize	Dr Mukesh Choudhary	Drs Bhupender Kumar, Pardeep Kumar, Mamta Gupta and Neeraj Budlakoti (IASRI)	July 2024-June 2029
11.	AR:IIM-R:22:MP-09	Assessment of conservation agriculture-based maize-wheat cropping system on soil health and input use efficiency	Dr. A.K. Singh	Drs. Dr. Seema Sepat and Dr. Ph. Romen Sharma	July 2022 to Jun 2026
12.	AR:IIM-R:22-MP-09-01	Application of image analysis for area, yield and stress estimation in maize	Dr. S.L. Jat	Drs. AK Singh, Ph. Romen Sharma, Bhupender Kumar, Suby SB, Sumit Agarwal, Sunil Neelam, DM Mahala	July 2022 to Jun 2027
13.	AR:IIM-R:22-FP-02	Best production practices for enhanced productivity and profitability in maize-based cropping system	Dr. AK Singh	Co-PIs: Dr Seema Sepat, Ph Romen Sharma and Dr PL Soujanya	July 2022 to Jun 2027
14.	AR:IIMR:22-MP-02-SP-02	Exploring zinc supplementation in soil for potential enhancement of cellulosic ethanol	Dr. Deep M. Mahala	Drs Alla Singh, Dr AK Singh, Dr SL Jat, Dr Seema Sepat, Shanti Devi Bamboriya, Mamta Gupta	July 2023 to Jun 2026
15.	AR:IIMR:22-MP-09-02-SP-03	Effects of maize-based intercropping on silage production and its quality	Dr. Seema Sepat	SD Bamboriya and J.S. Hundal	Feb 1, 2024 to Apr 30, 2025
16	AR:IIMR:22-FP-02-SP-01	Designing sustainable, productive and profitable cropping systems in Western IGP	Dr. Shanti Devi Bamboriya	Drs. Deep Mohan Mahala, SL Jat and HS Jat	Oct 2024 to Sept 2027

17	AR:IIMR:22-FP-02-SP-02	Evaluation of diverse management practises on maize system's productivity, profitability and soil health	Dr. Deep Mohan Mahala	Dr. Shanti Devi Bamboriya and SL Jat	July 2024 to June 2027
18	AR:IIMR:22:MP-08	Studies on Variability of Setosphaeria turcica and Bipolaris maydis, the incitant of Leaf Blights of Maize in India	Dr. Pravin K Bagaria	Drs. Prem U, MA Ahangar, N Mallikarjuna, Srabani Debnath, Alla Singh, Mamta Gupta, Pardeep Kumar, Mukesh Choudhary and Bharat Bhushan	Jul 2022 to Jun 2026
19	AR:IIMR:22:MP-07	Development of Sustainable Management Tools for Major Insect Pests of Maize	Dr. P.L. Soujanya	Drs. SB Suby, J.C. Sekhar, Bhupender Kumar, K.R. Yathish, P.G. Padmaja (Millets Institute) and HS Jat	July 2022 to Jun 2026
20	AR:IIMR:22-MP-08-01	Studies on Variability of Bipolaris maydis, the incitant of Maydis Leaf Blight of maize in India	Dr. Pravin Kumar Bagaria	Drs. Alla Singh, Mamta Gupta and Pardeep Kumar	Feb 2023 to Jun 2026
21	AR:IIMR:23-FP-04	Bio-ecology and eco-friendly management of fall armyworm (Spodoptera frugiperda) in Maize	Dr. Suby SB	Drs. Chikkappa GK, SL Jat, P.L. Soujanaya, Dr. Pravin K Bagaria	Jul 2023 to Jun 2026
22	AR:IIMR:21-MP-1-SP-01	Establishment of Agrobacterium mediated transformation and CRISPR-based genome editing system in tropical maize	Dr. Krishan Kumar	Drs. Mamta Gupta, Alla Singh	Jul 2022 to Jun 2027
23	AR:IIMR:22-MP-02-SP-01	Identification of kernel modifiers associated with various quality traits in tropical maize for their utilization in multi trait stacking	Dr. Alla Singh	Dr. Ramesh Kumar, Dr. Chikkappa GK, Dr. AK Das, Dr. Bharat Bhushan, Dr. Mamta Gupta	Oct 2022 to Sept 2027
24	AR:IIMR:23:FP-03	Exploring the potential of Vip3A-type proteins (vegetative insecticidal protein) for the management of fall armyworm Spodoptera frugiperda (J. E. Smith)	Dr. Mamta Gupta	Dr. Alla Singh, Dr. Krishan Kumar, Dr. Suby S.B., Dr. Jawala Jindal	July 2023 to June 2027
25	AR:IIMR:19-MP-02-SP-01	Evaluation of maize germplasm for starch & associated traits	Dr. Bharat Bhushan	Dr Abhijit K Das	July 2024 to Jun 2027
26	AR:IIMR:22:MP-10	Farmer led Innovations (FLI) in Maize and Mechanisms for their Scaling up	Dr. Alok Sahoo	Drs. S.L. Jat, Ph Romen Sharma, Dr. Sapna Nigam	July 2022 to Jun 2027
27	AR:IIMR:22:MP-11	Impact assessment of the improved maize technologies in various agro-ecologies	Dr. Ph. Romen Sharma	Drs Alok Sahoo, Dr. S.L. Jat, Dr. H.S. Jat	Jul 2022 to Jun 2027

28	AR:IIMR:22-MP-11-SP-01	Critical Analysis of Farmers Participatory Seed Production in Maize: Out scaling the model in Eastern India (Bihar & Odisha) through FPO	Dr. Alok Sahoo	Dr Ph Romen Sharma, Dr Bhupender Kumar, Dr S L Jat	Jul 2024 to till date

Externally Funded Project

Sr. No.	Scheme/Project	PI	Co-PI/CCPI	Project duration	Funding Agency
1.	Seed Production in Agricultural Crops	Dr. BS Jat	Drs. Bhupender Kumar and SB Singh	2017-2026 Ongoing Project	ICAR
2.	Consortia Research Platform on Molecular Breeding	Dr. Chikkappa G.K.	Dr Bhupender Kumar	2015-2026	ICAR
3.	Consortia Research Platform on Agrobiodiversity	Dr. Chikkappa G.K.	Dr Sunil Neelam	2014-2026	ICAR
4.	CRP on Maize Biofortification	Dr. Bhupender Kumar	Drs.SB Singh, Ramesh Kumar, Chikkappa GK, SL Jat, Abhijit Das, Deep Mohan Mahala & Pardeep Kumar	2017-2026	ICAR
5.	Maize Research for sustainable ethanol production in India	Dr. HS Jat	CCPIs: Dr. Bhupender Kumar & Dr. Firoz Hossain; Co-PI (IIMR): Drs SB Singh, Bharat Bhushan, Abhijit K Das, Krishan Kumar, Pardeep Kumar, Alla Singh, Mamta Gupta, Co-PI (IARI): Drs Vignesh M; Rajkumar U Zunjare	2023-24 to 2025-26	NFSM, MA&FW
6.	Improving rainfed (Kharif) maize productivity	Dr. Yathish K.R.	Drs. Ramesh Kumar, Chikkappa GK and BS Jat	Dec 2021 to Nov 2025	CIMMYT
7.	Evaluation of Foliar Application of Coromandel Nano urea in Maize Crop	Dr. A K Singh	Drs. S.L. Jat, Deep Mohan Mahala, Shanti Devi Bamboriya	Jun 2023 to June 2026	Coromandel
8.	Evaluation of Foliar Application of Rashtriya Chemical Nano urea in Maize Crop	Dr. AK Singh	Drs. S.L. Jat, Deep Mohan Mahala, Shanti Devi Bamboriya	Jun 2023 to Feb 2025	Rashtriya Chemical
9.	Enhancing climate resilience and ensuring food security with genome editing tool	Dr. Krishan Kumar	Drs. Mamta Gupta, Alla Singh, Bhupender Kumar, Mukesh Choudhary, Abhijit K Das and Pravin K Bagaria	2024-2027	ICAR
10.	Developing transgene free high-yielding and climate resilient tropical maize genotypes	Dr. Krishan Kumar	Drs. Bhupender Kumar, Mamta Gupta, Alla Singh and H.S. Jat	Oct 2024 to Sept 2027	DBT

11	Upscaling maize-based silage value chain in Punjab and Haryana	Dr. Pardeep Kumar	Drs. Seema Sepat, BS Jat, Alla Singh, Ph. Romen Sharma, DM Mahala, Bhupender Kumar, SL Jat, JS Hundal (GADVASU) and Manpreet Singh (PAU)	Oct 2023 to Sept 2026	NFSM, MA&FW
12.	Enhancement of maize production in catchment areas of ethanol industries	Dr SL Jat	Drs. Alok Sahoo, Bhupender Kumar, B.S. Jat, Deep Mohan Mahala, Mukesh Choudhary, N. Sunil, Pardeep Kumar, Romen Sharma, Suby SB	Apr 2024 to Mar 2027	NFSM, MA&FW
13.	Deployment & Scaling of high-yielding, climate-resilient maize hybrids to enhance the productivity of low-yielding districts in the Kharif season	Dr. H.S. Jat PI-Drs. S.L. Jat and Bhupender Kumar R.L. Soni, Hargilas, Z.A. Darr, S.R. Karad, Sunil Umate, Dinesh Kanwade, Shiddappa Sabkinkop	-	Nov 2024 to Mar 2027	CIMMYT
14.	Exploring the Potential of Natural Farming for Sustainable Maize-Based Cropping System	Dr. N. Sunil	Dr. Deep Mohan Mahala, Ms V. Sujatha	May 2025 to April 2028	IGGAARL
15.	Frontline Demonstration in Maize under NFSM	Dr. SL Jat	Dr. Romen Sharma and Priyajoy Kar	2014 - ongoing	NFSM
16.	Development of male sterility based maize hybrids for different ecologies of India	Dr. Pardeep Kumar	Drs. Yathish K.R., Mamta Gupta	1 July 2025	-
17.	Germplasm diversification and yield enhancement of waxy maize for industrial usesg	Dr. Abhijit K Das	Dr. Bhupender Kumar	2025	-
18.	Improving the livelihood and nutritional security through scientific maize cultivation and maize-based entrepreneurship development in affected areas of the Koraput district	Ph. Romen Sharma	Drs.SL Jat Collaborative: Dean of Research OUAT, Dr. Digvijay Swain (Breeder & I/c, AICRP Maize Centre, OUAT Bhubhaneshwar) Dr. Pramila Naik (Agronomist, AICRP Maize Centre, OUAT, Bhubneshwar) Dr. P. Sial (ADR, RRTTS, Semiliguda, Koraput) Dr. M.R. Mohanty (OIC, RRTTSS, OUAT, Jeypore, Koraput)	(Oct 2022 to Sept 2025)	Odisha Govt.

ANNEXURE-VIII

Annual Financial Statement (2025-26)

Expenditure Statement (2025-26)

(Rupees in Lakhs)

RE 2025-26				Actual Expenditure during 2025-26		
Head of Account	**Institute Govt. Grant**	**Govt. Schemes**	**AICRP on Maize**	**Institute Govt. Grant**	**Govt. Schemes**	**AICRP on Maize**
Grant in Capital	637.90	733.17	60.00	637.90	732.74	60.00
Grant in Salary	997.02	0.00	2855.00	997.02	0.00	2855.00
Grant in General including Pension	433.80	259.24	307.10	433.80	258.84	307.10
TSP (General)	15.00	0.00	65.00	15.00	0.00	65.00
NEH (General)	78.00	0.00	100.00	78.00	0.00	100.00
NEH (Capital)	0.00	0.00	0.00	0.00	0.00	0.00
SCSP (General)	60.00	0.00	0.00	60.00	0.00	0.00
SCSP (Capital)	10.00	0.00	0.00	10.00	0.00	0.00
Total	**2231.72**	**992.41**	**3387.10**	**2231.72**	**991.58**	**3387.10**

Revenue Generation during the year 2025-26

Particulars	**(Rupees in Lakhs)**
Sale of Farm produce	86.67
Sale of vehicle, other machine tools	0.00
License Fee	4.33
Application fee from candidates	18.08
Analytical and testing fee	3.01
Receipts from Services rendered	0.00
Miscellaneous receipts	4.97
Total	**117.06**

Funds received for externally funded projects during the year 2025-26

Particulars	(Rupees in Lakhs)
DUS Project	19.27
FLD on Maize (National Food Security Mission "NFSM")	230.00
DBT project (Developing transgene free high Yield)	49.53
Upscalling maize based silage Value	186.20
Ethanol Production in india	259.64
Up-Scalling of Chitosan Thymol based smart	5.06
Catchment area Project	495.40
CASMA Project	57.11
EMR-II (CSIR-HEDG) Scheme No 1827	4.46
Evaluation of Isoxaflutole (Bayer Crop)	3.92
CIMMYT (Improving Rainfed Maize Productivity)	3.12
Women Scientist Project	12.00
CDP-MLIP Project	3.22
RYSS Project	60.13
FAO Representation Project	16.80
Total	**1405.86**

Financial targets and achievements (All employees)

(Rupees in Lakhs)

RE 2025-26 for HRD	Actual Expenditure up to 31st March, 2026 for HRD	% Utilization of RE 2025-26
0.48	0.48	100%

ANNEXURE-IX

Personnel, Transfers, New Joining, Superannuation, Promotion

Existing Staff in position

Name	Designation	Discipline
Dr. Hanuman Sahay Jat	Director	Agronomy
Dr. Shyam Bir Singh	Principal Scientist	Genetics & Plant Breeding
Dr. Ramesh Kumar	Principal Scientist	Genetics & Plant Breeding
Dr. Seema Sepat	Senior Scientist	Agronomy
Dr. Manesh Chander Dagla	Senior Scientist	Genetics & Plant Breeding
Dr. Bharat Bhushan	Senior Scientist	Plant Biochemistry
Dr. Abhijit Kumar Das	Senior Scientist	Genetics & Plant Breeding
Dr. Pardeep Kumar	Senior Scientist	Genetics & Plant Breeding
Dr. Mamta Gupta	Scientist	Agricultural Biotechnology
Dr. Alla Singh	Scientist	Agricultural Biotechnology
Dr. Bahadur Singh Jat	Scientist	Genetics & Plant Breeding
Dr. Pravin Kumar Bagaria	Scientist	Plant Pathology
Dr. Mukesh Chaudhary	Scientist	Genetics & Plant Breeding
Dr. Romen P. Sharma	Scientist	Agricultural Extension
Dr. Deep Mohan Mahala	Scientist	Soil Science
Dr. Shanti Devi Bamboriya	Scientist	Agronomy
Dr. Prabha Singh	Scientist	Plant Physiology
Dr. Ankita Kataria	Scientist	Food Technology
Dr. K. Kamesh Krishnamoorthy	Scientist	Plant Pathology
Dr. Athare Prakash Goraksha	Scientist	Agricultural Economics
Sh. B.C. Katoch	Senior Administrative Officer	NA
Sh. Ajay Kumar Tandon	Finance & Accounts Officer	NA
Sh. Prashant Garg	Assistant Administrative Officer	NA
Smt. Sandeep Kaur	Assistant Administrative Officer	NA
Miss Usha Birdi	Assistant	NA
Smt. Prabhjot Kaur	Assistant	NA
Mr. Tanuj	Assistant	NA
Miss. Neetika	Assistant	NA
Mrs. Sapna Rani	Assistant	NA
Mr. Puneet Dagar	Assistant	NA
Sh Ravi Chaudhary	Personal Assistant	NA
Mr. Ravi Kumar	T-1	NA
Mr. Virmani Kumar	T-1	NA

Indian Institute of Maize Research, Unit Office, Delhi

Name	Designation	Discipline
Dr. Shanker Lal Jat	Senior Scientist	Agronomy
Dr. Suby Sulaikhabeevi B	Senior Scientist	Agricultural Entomology
Dr. Bhupender Kumar	Senior Scientist	Genetics & Plant Breeding
Dr. Krishan Kumar	Scientist	Agricultural Biotechnology
Sh. Anwar Ali	SSS	NA

Regional Maize Research & Seed Production Centre, Begusarai

Name	Designation	Discipline
Dr. Chikkappa G. Karjagi	Principal Scientist	Genetics & Plant Breeding
Dr. Chander Mohan	Senior Scientist	Seed Science & Technology
Dr. Alok Kumar Sahoo	Scientist	Agricultural Extension
Dr. Susmita Cherukuri	Scientist	Genetics & Plant Breeding
Mr. Kamal Vats	T5	NA
Mr. Rahul	T4	NA

Winter Nursery Centre, Hyderabad

Name	Designation	Discipline
Dr. Neelam Sunil	Principal Scientist	Economic Botany
Dr. P. Laxmi Soujanya	Senior Scientist	Agricultural Entomology
Dr. K.R. Yatish	Senior Scientist	Genetics & Plant Breeding
Amar Nath	T-1	NA

New Joining

Name & Designation	Date	Discipline
Dr. Chander Mohan, Senior Scientist	27.05.2025	Seed Science & Technology
Dr. Prabha Singh, Scientist	21.07.2025	Plant Physiology
Dr. Ankita Kataria, Scientist	07.07.2025	Food Technology
Dr. K. Kamesh Krishnamoorthy, Scientist	05.12.2026	Plant Pathology
Dr. Athare Prakash Goraksha, Scientist	05.08.2025	Agricultural Economics
Miss. Neetika, Assistant	21.01.2026	NA
Mrs. Sapna Rani, Assistant	06.02.2026	NA
Mr. Puneet Dagar, Assistant	23.01.2026	NA
Sh. Ravi Chaudhary, Personal Assistant	03.02.2025	NA

Transfer To

Name	Date	Transferred To
Nil		

Transfer From

Name	Date of Joining	Transferred From
Dr. Prabha Singh	21.07.2025	ICAR-IGFRI, Jhansi

Staff on Deputation

Name	Period	Institute
Dr. Dharam Pal	26.07.2024 to 25.07.2028	MHU, Karnal (Haryana)

Promotion

Name	Date	Promotion
Dr. Yathish K. R	10.02.2023	Sr. Scientist, Pay Level 13A
Sh. Amarnath, T-1	15.09.2025	Promoted from SSS to T-1

Staff Positions of ICAR-IIMR

Type	Approved	In Position	Vacant
Scientific	42	32	10
Administrative	21	11	10
Technical	10	5	5
Supporting	3	1	2

AICRP on Maize Centres