BWMRI

Annual Report

2022-2023

Bangladesh Wheat and Maize Research Institute
Nashipur, Dinajpur 5200
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BWMRI Annual Report 2022-23

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PREFACE

Wheat and maize are the two important cereals next to rice in Bangladesh and playing an important role in attaining food and nutritional security. During 2021-22, 1.17 million ton of wheat was produced from -0.32 million ha that can meet only 20% of the national requirement. On the other hand, demand of wheat has been increasing every year at the rate of 13% due to rapid changes in dietary habit, socio-economic upliftment, enhancement of per capita income, rapid growth of fast food restaurant, establishment of branded bakery and biscuit industries, etc. There is significant increase in wheat productivity of 3.65 t/ha in 2021-22 which was possible through dissemination of high yielding, disease resistant and stress tolerant varieties and improved management practices to the farmers.

Although maize is not a staple food cereal yet in Bangladesh, but presently it is the third most important cereal after rice and wheat. During 2021-22, 5.63 million ton of maize was produced from 0.55 million ha of land, whereas the annual grain requirement is about 7.0 million tons. Current national average yield of maize is 10.2 t/ha which is due to the introduction of hybrids and adoption of appropriate crop management practices. Demand of maize is increasing in Bangladesh day by day due to its' increasing demand for poultry, fish and animal feed and production of different types of processed foods, and also for export.

Bangladesh Wheat and Maize Research Institute (BWMRI) is entrusted to the research works for the improvement of wheat and maize in Bangladesh. This report contains the results of research activities conducted during 2021-22 across the country. Major thrust was given to develop high yielding wheat and maize varieties with resistance/tolerance to ranges of abiotic (heat, drought, salinity) and biotic (diseases) stresses and fitting well to the existing cropping systems. Variations and recombination have been creating through hybridization every year at BWMRI to generate new genetic stocks and select climate resilient and disease resistant varieties. Moreover, Marker Assisted Breeding has been introduced to bring new momentum in the variety improvement programme. Special research programme has been undertaken in collaboration with CIMMYT, KSU, CSIRO, ACIAR, SLU, KGF, UQ-Australia and USAID to develop abiotic (heat, drought, salinity) and biotic (diseases) stresses wheat and maize varieties.

A wheat blast: precision phenotyping platform (PPP) has been established at RARS Jashore with CIMMYT/ACIAR funding for large scale screening of against wheat blast. Three blast resistant/tolerant varieties have been developed by evaluating under this platform. Few blast resistant genotypes also identified for further observation. A large number of germplasms were received from CIMMYT have enriched our wheat genetic stock for proper evaluation and screening. Results of variety development, crop and soil management, participatory variety selection, disease management, farm machinery made the report a valuable document of BWMRI activities.

BWMRI has also been testing exotic hybrids received from CIMMYT through HTMA project, an USAID funded project led by CIMMYT in collaboration with private partners (BRAC, ACI Ltd. & Lal Teer Seed Ltd.). The aim is to identify better performing hybrids, targeted for heat stress prone areas and so far three heat resilient maize varieties have been released under this project and few are in pipeline. Every year a large number of germplasms were received from CIMMYT through HTMA project for phenotyping under heat stress and optimal condition. BWMRI is also collaborating with BRAC & ACI under Bangladesh Coordinated Maize (BCM) Trials with the objectives to join hands with the private maize growing partners to widen the testing network for maize hybrids in the country and to generate robust data through multi location (on-farm/on-station) trials on best-bet/final stage hybrids selected from on-station trials.

Besides, BWMRI produces nucleus, breeders and truthfully labelled seeds of wheat and maize for BADC, NGO, private sectors and farmers; imparts training to DAE, BADC, NGO personnel and farmers; conducts demonstration, workshops, field days, publications etc. All these attempts have been made to transfer the new technologies to the end users to enhance national wheat and maize productivity. In addition, results of different collaborative studies with NGOs and some donor agencies under project-aids have made this report worth.

Emphasis has been given to develop and refine other production technologies especially resource conservation technologies such as zero tillage, strip tillage and bed planting practices, and their economic analyses. Research thrust has also been given to modify and develop appropriate machinery for small farming and expand areas under mechanization.

Nevertheless, limited research works on triticale and durum are also going on to develop new varieties for food and feed.

It is a great pleasure to mention that first blast resistant and zinc enriched wheat variety BARI Gom 33 has been released in 2017 for commercial cultivation. Another two blast resistant/tolerant varieties WMRI Gom 2 and WMRI Gom 3 have also been released in 2020. Few promising blast resistant advanced lines are in the pipe line for release as varieties. Besides these wheat varieties, maize varieties WMRI Hybrid Maize 1; WMRI Hybrid Baby Corn 1 and BWMRI Hybrid Maize 2 were released in 2020 and 2022, respectively.

I convey my sincere thanks and gratitude to the BARI authority, CIMMYT, BGRI, Cornell University, KARLO-Kenya, USDA-ARS, KSU and the donor agencies like University of Queensland, CSIRO, ACIAR, SLU, ARRCC, Cambridge University, USAID, and KGF for their extended cooperation and support for wheat and maize research and development in Bangladesh.

I acknowledge with great thanks, the contributions of the scientists of BWMRI who at the expenses of hard work and sincere devotion have completed this report. Share of thanks also goes to the scientific staffs for their help in collecting field data along with the scientists and office staff to make the research activities successful.

I think this is going to be a valuable documents for those who are concerned with wheat and maize research and development activities in Bangladesh and beyond.

Director General

সূচীপত্র

ভূমিকা

বাংলাদেশ গম ও ভুট্টা গবেষণা ইনস্টিটিউট একটি সদ্য প্রতিষ্ঠিত গবেষণা প্রতিষ্ঠান। স্বাধীনতা পরবর্তী সময়ে জাতির জনক বঙ্গবন্ধু শেখ মুজিবুর রহমান এর সুযোগ্য নেতৃত্বের কারণে ত্বরান্বিত গম গবেষণা কর্মসূচীর মাধ্যমে দেশে গম গবেষণা কার্যক্রম শুরু হয়। এর ধারাবাহিকতায় ১৯৮৪ সালে দিনাজপুরে বাংলাদেশ কৃষি গবেষণা ইনস্টিটিউটের অধীনে গম গবেষণা কেন্দ্র স্থাপিত হয়। বিগত ২৮ ফেব্রুয়ারি ১৯৯৮ খ্রি. তারিখে তৎকালীণ ও বর্তমান প্রধানমন্ত্রী শেখ হাসিনা দিনাজপুরে এক জনসভায় গম গবেষণা কেন্দ্রকে পূর্ণাঙ্গ ইনস্টিটিউট এ উন্নীতকরণের প্রতিশ্রুতি প্রদান করেন। প্রতিশ্রুতি বাস্তবায়নের লক্ষ্যে জুলাই ১৯৯৯ থেকে জুন ২০০৭ খ্রি. মেয়াদে "গম গবেষণা কেন্দ্রকে গম গবেষণা ইনস্টিটিউট এ উন্নীতকরণের লক্ষ্যে ব্রিজিং প্রকল্প" বাস্তবায়িত হয়। ২০০৬ সালে গম ফসলের সাথে ভুট্টাকে যুক্ত করার সিদ্ধান্ত গৃহীত হয়। বিগত ০৮ জুন ২০১৪ খ্রি. তারিখে আন্তঃমন্ত্রণালয় সভায় কৃষি মন্ত্রণালয় কর্তৃক প্রস্তুতকৃত "বাংলাদেশ গম ও ভুট্টা গবেষণা ইনস্টিটিউট আইন, ২০১৬ এর খসড়া চূড়ান্ত করা হয় এবং ৩১ অক্টোবর ২০১৬ খ্রি. তারিখে মন্ত্রীসভায় আইনটি চূড়ান্ত অনুমোদন লাভ করে। গত ১৩ নভেম্বর ২০১৭ খ্রি. তারিখে "বাংলাদেশ গম ও ভুট্টা গবেষণা ইনস্টিটিউট আইন, ২০১৭" মহান জাতীয় সংসদে পাশ হয়েছে এবং ২২ নভেম্বর ২০১৭ খ্রি. গেজেট নোটিফিকেশনের মাধ্যমে উক্ত আইন বলবৎ হয়েছে। এর প্রধান কার্যালয় দিনাজপুর জেলার সদর উপজেলার নশিপুরে অবস্থিত। একজন মহাপরিচালক প্রতিষ্ঠানটির প্রধান নির্বাহী হিসেবে দায়িত্ব পালন করছেন। প্রতিষ্ঠানটি গবেষণা ও প্রশিক্ষণে গৌরবময় ও কৃতিত্বপূর্ণ অবদানের স্বীকৃতিস্বরূপ ২০২২ সালের স্বাধীনতা পুরস্কারে ভূষিত হয়েছে।

রূপকল্প (Vision)

খাদ্য ও পুষ্টি নিরাপত্তা অর্জনে গম ও ভুট্টার জাত ও প্রযুক্তি উদ্ভাবন।

অভিলক্ষ্য (Mission)

- গম ও ভুট্টার উচ্চফলনশীল জাত ও উন্নত চাষাবাদ পদ্ধতি উদ্ভাবন;
- পোকামাকড় ও রোগবালাই দমন ব্যবস্থাপনা, মৃত্তিকা ব্যবস্থাপনা ও শস্য সংগ্রহোত্তর ব্যবস্থাপনা বিষয়ে লাগসই প্রযুক্তি উদ্ভাবন;
- কৃষি যন্ত্রপাতির ব্যবহার বৃদ্ধি, ভুট্টা ও ভুট্টাজাত দ্রব্যের শিল্পভিত্তিক বহুমুখী ব্যবহার বিষয়ে লাগসই প্রযুক্তি উদ্ভাবন;
- উদ্ভাবিত জাত ও প্রযুক্তিসমূহ হস্তান্তর করা।

কৌশলগত উদ্দেশ্যসমূহ (Strategic Objectives)

- ফসলের জার্মপ্লাজম সংগ্রহ, সংরক্ষণ ও উন্নয়ন, সংকরায়ন, মূল্যায়ন এবং জাত অবমুক্তকরণ;
- সাধারণ পরিবেশসহ তাপ, লবণাক্ততা, জলবদ্ধতা ও খরা সহনশীল গম ও ভুট্টার জাত উদ্ভাবন;
- উন্নত ও আধুনিক উৎপাদন প্রযুক্তি উদ্ভাবন;
- কৃষি যন্ত্রপাতি ও শস্য সংগ্রহোত্তর প্রযুক্তি উদ্ভাবন;
- উদ্ভাবিত জাত, উৎপাদন প্রযুক্তি ইত্যাদির আর্থ-সামাজিক বিশ্লেষণ;
- উদ্ভাবিত জাতসমূহের প্রজনন বীজ ও মানঘোষিত বীজ উৎপাদন;
- প্রযুক্তি হস্তান্তরের জন্য প্রশিক্ষণ, উপযোগিতা পরীক্ষণ, কর্মশালা, মাঠ দিবস ইত্যাদির আয়োজনসহ বৈজ্ঞানিক প্রকাশনা প্রকাশ;
- মানব সম্পদ উন্নয়ন, প্রশাসনিক ও আর্থিক ব্যবস্থাপনা;
- কৃষি বিষয়ক ই-তথ্য সেবা প্রণয়ন;
- আন্তর্জাতিক ও দেশীয় প্রতিষ্ঠানের সাথে গবেষণা সংযোগ স্থাপন।

প্রধান কার্যাবলি (Main Functions)

- গম ও ভুট্টার উন্নয়ন ও উৎপাদন সংক্রান্ত বিষয়ে নীতিমালা প্রণয়ন ও বাস্তবায়ন; ইনস্টিটিউটের কর্ম পরিকল্পনা প্রণয়ন;
- গম ও ভুট্টার উন্নয়ন ও উৎপাদন সংশ্লিষ্ট বিষয়ে মৌলিক, ফলিত ও সরেজমিন গবেষণা পরিচালনা ও প্রযুক্তি উদ্ভাবন;
- গবেষণার জন্য আধুনিক সুযোগ-সুবিধা সম্বলিত গবেষণাগার, খামার ও অবকাঠামো স্থাপন;
- জার্মপ্লাজম সংগ্রহ ও সংরক্ষণের সুযোগ-সুবিধা সৃষ্টি;
- গম ও ভুট্টা উৎপাদন দক্ষতার সাথে সম্পন্ন করার নিমিত্তে কৃষকদের প্রয়োজনীয় তথ্য সরবরাহ এবং প্রশিক্ষণ প্রদান;
- গম ও ভুট্টা উৎপাদনের উপর জলবায়ুর পরিবর্তনের প্রভাব নিরুপণ এবং এতদসক্রান্ত গবেষণা কার্যক্রম গ্রহণ ও বাস্তবায়ন;
- প্রজনন ও মানঘোষিত উচ্চ ফলনশীল গম ও ভুট্টা বীজ উৎপাদন, প্রদর্শনী ও সম্প্রসারণের জন্য বিতরণ;
- গম ও ভুট্টা সংক্রান্ত পুস্তিকা, মনোগ্রাম, বুলেটিন এবং গবেষণা সংক্রান্ত অন্যান্য তথ্য প্রকাশ;
- জাতীয় ও আন্তর্জাতিক সংস্থা ও সংগঠনসমূহের সহযোগিতায় গবেষণা কর্মসূচি গ্রহণ।

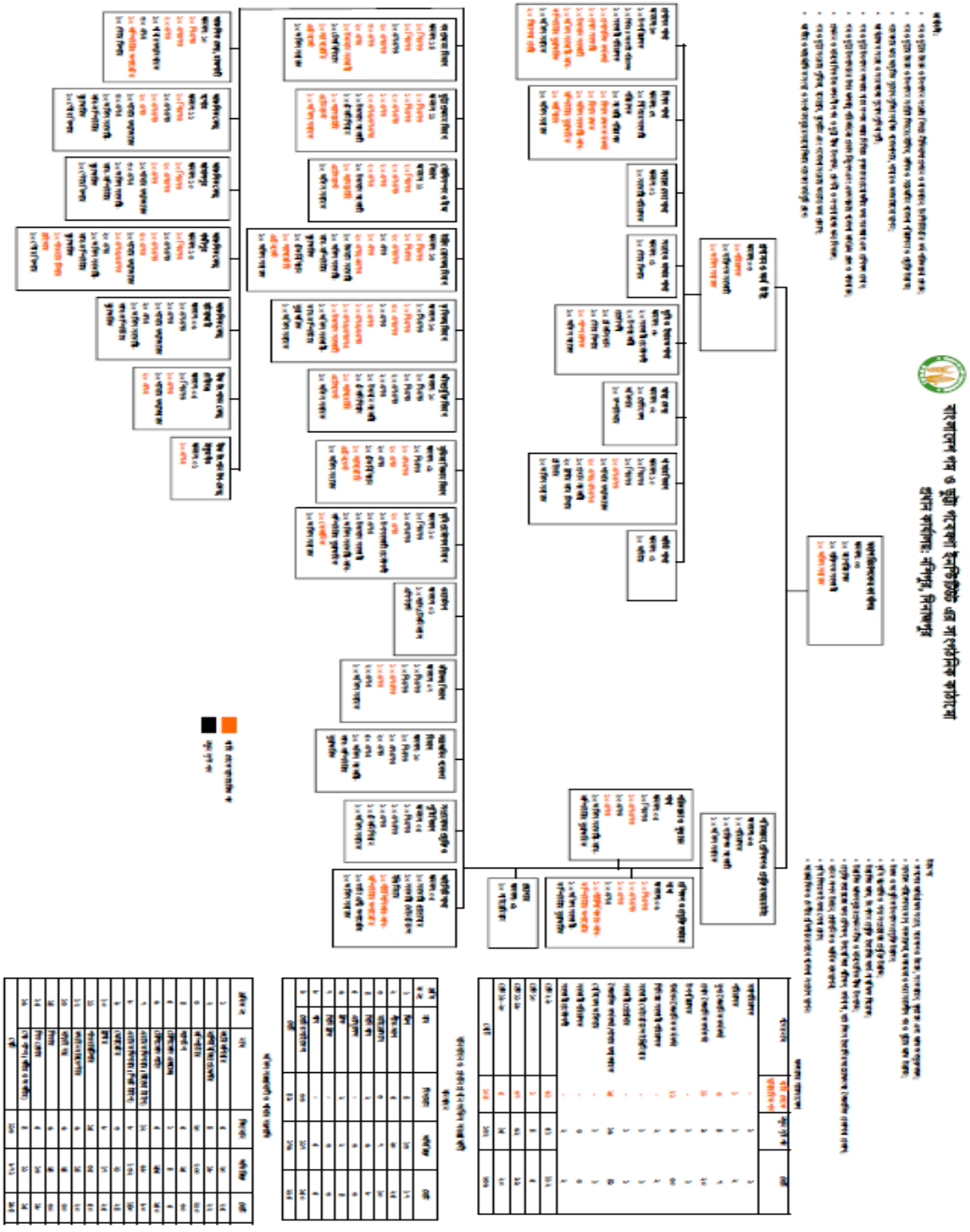
সাংগঠনিক কাঠামো (বর্ণনা):

বাংলাদেশ গম ও ভুট্টা গবেষণা ইনস্টিটিউট এর সাংগঠনিক কাঠামো অনুযায়ী মহাপরিচালক প্রতিষ্ঠানটির প্রধান নির্বাহী হিসেবে কাজ করেন। প্রশাসন ও অর্থ উইং এবং পরিকল্পনা, প্রশিক্ষণ ও প্রযুক্তি হস্তান্তর উইং নামে ২টি উইং রয়েছে। দুটি উইং এর দায়িত্বে ২জন পরিচালক রয়েছেন। প্রধান কার্যালয় ছাড়াও গাজীপুর, জামালপুর, যশোর, রাজশাহী ও হাটহাজারী জেলায় ১টি করে মোট ৫টি আঞ্চলিক কেন্দ্র, পঞ্চগড়ে ১টি বীজ উৎপাদন কেন্দ্র ও ঠাকুরগাঁও জেলায় ১টি বীজ উৎপাদন উপকেন্দ্র রয়েছে। প্রধান কার্যালয়ে ১৪টি বিভাগ (গম প্রজনন, ভুট্টা প্রজনন, কৌলিসম্পদ ও বীজ, উদ্ভিদ রোগতত্ত্ব, কৃষিতত্ত্ব, খামার, জীবপ্রযুক্তি, কীটতত্ত্ব, সংগ্রহোত্তর প্রযুক্তি ও পুষ্টি, মৃত্তিকা বিজ্ঞান, কৃষি প্রকৌশল, সরেজমিন গবেষণা, পরিকল্পনা ও মূল্যায়ন, প্রশিক্ষণ ও প্রযুক্তি হস্তান্তর), ৭ টি শাখা (প্রশাসন, হিসাব, সাধারণ সেবা, সংগ্রহ ও ভান্ডার, ভুমি ও ইমারত, অডিট, আইসিটি), ১টি স্বাস্থ্য কেন্দ্র ও ১টি গ্রন্থাগার রয়েছে। বাংলাদেশ গম ও ভুট্টা গবেষণা ইনস্টিটিউট এর সার্বিক কার্যক্রম পরিচালনার জন্য রাজস্বখাতে মোট ২৩৬টি পদ রয়েছে। এর মধ্যে গ্রেড ২ থেকে গ্রেড৯ এর মোট ১১২টি পদ রয়েছে। এছাড়া গ্রেড ১০ এর ৫টি, গ্রেড ১১ থেকে গ্রেড ১৮ এর ৯৯টি এবং গ্রেড ১৯ থেকে গ্রেড ২০ এর ২০টি পদ রয়েছে।

জনবলের তথ্য:

ক্রমিক নং	বিজ্ঞানী/ কর্মকর্তা	পদ সংখ্যা	কর্মরত	মন্তব্য
১	মহাপরিচালক	১	০	চলতি দায়িত্ব
২	পরিচালক	২	০	১ জন অতিরিক্ত দায়িত্ব
৩	মুখ্য বৈজ্ঞানিক কর্মকর্তা	৭	৫	
৪	প্রধান বৈজ্ঞানিক কর্মকর্তা	২০	৮	
৫	উপপরিচালক	১	১	
৬	উর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা	৩০	২০	
৭	সিনিয়র সহকারী পরিচালক	২	১	
৮	বৈজ্ঞানিক কর্মকর্তা	৩৪	১৫	
৯	খামার তত্ত্বাবধায়ক	৭	৪	
১০	সহকারী পরিচালক	৩	১	
১১	মেডিকেল অফিসার	১	১	
১২	সহকারী প্রকৌশলী	২	০	
১৩	সহকারী প্রোগ্রামার	১	১	
১৪	সহকারী মেইনটেনেন্স ইঞ্জিনিয়ার	১	১	
	মোট প্রথম শ্রেণীর কর্মকর্তা	১১২	৫৮	
১৫	দ্বিতীয় শ্রেণীর কর্মকর্তা	৫	১	
১৬	তৃতীয় শ্রেণীর কর্মচারী	৯১	৫৪	
১৭	চতুর্থ শ্রেণীর কর্মচারী	২৮	৮	
	মোট	২৩৬	১২১	

প্রাতিষ্ঠানিক কাঠামোঃ



বিজ্ঞানী ও কর্মকর্তাদের তথ্য:

প্রধান কার্যালয়, নশিপুর, দিনাজপুর

ক্রমিক নং	কর্মকর্তার নাম ও পদবী	ফোন (অফিস)	মোবাইল	ই-মেইল নম্বর
১	ড. গোলাম ফারুক মহাপরিচালক	০২৫৮৮৮১৭৭৩০	০১৭২৫৪৪৪৫৫৫	faruqwrc@gmail.com dg.bwmri@gmail.com
২	ড. মোঃ আবু জামান সরকার পরিচালক (প্রশাসন ও অর্থ)	০২৫৮৮৮১৭৭৩১	০১৭১২৫৫০০১১	zsarker65@gmail.com dir.anf@bwmri.gov.bd
৩	ড. সালাহ্উদ্দিন আহমেদ মুখ্য বৈজ্ঞানিক কর্মকর্তা ও প্রধান ভুট্টা প্রজনন বিভাগ	০২৫৮৮৮১৭৭৩২	০১৭১৫২১৩৭৬৮	su_ahmed66@yahoo.com dir.ptt@bwmri.gov.bd
৪	ড. মোঃ আব্দুল হাকিম প্রধান বৈজ্ঞানিক কর্মকর্তা ও প্রধান গম প্রজনন বিভাগ	০২৫৮৮৮১৭৭৩৫	০১৭১১৭৮৮১৫৩	hakimbwmri@gmail.com mahakim@bwmri.gov.bd
৫	ড. মো. মাহফুজ বাজ্জাজ, প্রধান বৈজ্ঞানিক কর্মকর্তা কৃষিতত্ত্ব বিভাগ	০২৫৮৮৮১৭৭৩৪	০১৭১৬১৩৪৭৩৩	mbazzaz72@yahoo.com mahfuz.bazzaz@bwmri.gov.bd
৬	ড. মোঃ মাহফুজুল হক প্রধান বৈজ্ঞানিক কর্মকর্তা ভুট্টা প্রজনন বিভাগ	০২৫৮৮৮১৭৭৪৬	০১৭১৬৯৮৬৪৫৭	mahfuzh492@gmail.com mahfuzbari@yahoo.com mahfuzul.hoque@bwmri.gov.bd
৭	ড. আকবর হোসেন প্রধান বৈজ্ঞানিক কর্মকর্তা মৃত্তিকা বিজ্ঞান বিভাগ	০২৫৮৮৮১৭৭৩৮	০১৭৯০০৪৯৬০৯	akbar.hossain@bwmri.gov.bd
৮	ড. মোসাঃ মাসুমা আখতার প্রধান বৈজ্ঞানিক কর্মকর্তা ও প্রধান কৌলিসম্পদ ও বীজ বিভাগ	০২৫৮৮৮১৭৭৪৭	০১৭১৫২০৫১৪৪	masuma_73@yahoo.com masuma@bwmri.gov.bd
৯	ড. মো. আব্দুল্লাহ আল মামুন প্রধান বৈজ্ঞানিক কর্মকর্তা ও প্রধান সরেজমিন গবেষণা বিভাগ	০৭২১৭৫০৪৬২	০১৭১৫৫৭২৫৬৭	mamunrwrc@yahoo.com ma-al-mamun@bwmri.gov.bd
১০	মোঃ আমিনুল ইসলাম আনু উপপরিচালক		০১৭৩৩০৯৮৫০৮	anudinaj@gmail.com anu.dinaj@bwmri.gov.bd
১১	মনিরুজ্জামান ঊর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা ভুট্টা প্রজনন বিভাগ		০১৭১৭৭০১০০০	muzaman12@gmail.com md.moniruzzaman@bwmri.gov.bd
১২	কিশওয়ার-ই-মুস্তারিন ঊর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা উদ্ভিদ রোগতত্ত্ব বিভাগ		০১৭১২০০২৭৬১	rimubari@yahoo.com kmustarin@bwmri.gov.bd
১৩	ড. মো. মোস্তাফিজুর রহমান শাহ ঊর্ধ্বতন বৈজ্ঞানিক কর্মকর্তাত ও প্রধান কীটতত্ত্ব বিভাগ		০১৭১২৫৬১৫৯২	mostafiz.wrc@gmail.com mmr.shah@bwmri.gov.bd
১৪	ড. মোঃ জাহেরুল ইসলাম ঊর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা গম প্রজনন বিভাগ		০১৭১৫৫২৪১২৬	mdzaherul7704@gmail.com zaherul.islam@bwmri.gov.bd
১৫	ড. মো. সিদ্দিকুন নবী মন্ডল ঊর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা কৌলিসম্পদ ও বীজ বিভাগ		০১৭১৭১৩৯১৩৯	snabibari@gmail.com mandal2003@bwmri.gov.bd

ক্রমিক নং	কর্মকর্তার নাম ও পদবী	ফোন (অফিস)	মোবাইল	ই-মেইল নম্বর
১৬	ড. মোহাম্মদ রেজাউল কবীর উর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা গম প্রজনন বিভাগ		০১৭৯৬৫৮৬০৩৯	rezaulw@yahoo.com rezaul.kabir@bwmri.gov.bd
১৭	ড. আবুল আওলাদ খান উর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা গম প্রজনন বিভাগ		০১৭১৭৫১০০৭১	aakhanwrc@gmail.com aa.khan@bwmri.gov.bd
১৮	মো. মনোয়ার হোসেন উর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা গম প্রজনন বিভাগ		০১৭১৬৫৯৯৪৮৭	monwardae@yahoo.com monwar.hossain@bwmri.gov.bd
১৯	মোঃ জাকির হোসেন উর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা কৃষি প্রকৌশল বিভাগ		০১৭১০৩৭৫৯৪৩	zakzuberi@gmail.com zakir.hossain@bwmri.gov.bd
২০	আসগার আহমেদ উর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা ভুট্টা প্রজনন বিভাগ		০১৭৪৪৮৩৮৯৯১	asgar.gene@gmail.com asgar.ahmed@bwmri.gov.bd
২১	ড. মোঃ ফরহাদ উর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা গম প্রজনন বিভাগ		০১৭১৯৬৬৬৯৩৩	farhadnabin@gmail.com md.farhad@bwmri.gov.bd
২২	মো. শরিফুল বিন একরাম বৈজ্ঞানিক কর্মকর্তা কৃষি প্রকৌশল বিভাগ		০১৭১৭৫৪৫৭৯৭	mnalam79@yahoo.com sarifulbin.ekram@bwmri.gov.bd
২৩	কৃষ্ণ কান্ত রায় উর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা উদ্ভিদ রোগতত্ত্ব বিভাগ		০১৭৫১২১৬৭৭৮	rkrishnaroy666@gmail.com kkroy@bwmri.gov.bd
২৪	কপিল দেব দত্ত সিনিয়র সহকারী পরিচালক (প্রশাসন)		০১৫৭১৭৬৭৬৬৮	kapil@bwmri.gov.bd kapil@bwmri.gov.bd
২৫	জাবের বিন আজিম বৈজ্ঞানিক কর্মকর্তা ভুট্টা প্রজনন বিভাগ		০১৭৯৮৭০৩৫১০	Jaber@bwmri.gov.bd
২৬	মোছাঃ সিরাজুম মুনিরা বৈজ্ঞানিক কর্মকর্তা কীটতত্ত্ব বিভাগ		০১৭৯৪৮৫৭০৬৭	sirajummunira0756@gmail.com sirajum.munira@bwmri.gov.bd
২৭	তৌহিদুল ইসলাম বৈজ্ঞানিক কর্মকর্তা সরেজমিন গবেষণা বিভাগ		০১৭৪১৯২১১৮৩	touhidul.ofrd@bwmri.gov.bd
২৮	মোঃ তাহারাত আল তৌহিদ বৈজ্ঞানিক কর্মকর্তা উদ্ভিদ রোগতত্ত্ব বিভাগ		০১৭২৩৩০৫৪৮০	taharat37@bwmri.gov.bd
২৯	শফিউল ইসলাম বৈজ্ঞানিক কর্মকর্তা কৌলিসম্পদ ও বীজ বিভাগ		০১৭৭৫৭৪৩৯৩৮	sm.islam@bwmri.gov.bd
৩০	তানভীর মাহমুদ বৈজ্ঞানিক কর্মকর্তা প্রশিক্ষণ ও প্রযুক্তি হস্তান্তর শাখা		০১৭২৩৮২৫৮১৪	tanvir.mahmud@bwmri.gov.bd
৩১	আননিকা জাহান অন্তি বৈজ্ঞানিক কর্মকর্তা মৃত্তিকা বিজ্ঞান বিভাগ		০১৭৬১৬৮১৮৯৮	aonti@bwmri.gov.bd
৩২	মোঃ মবিনুর রহমান বৈজ্ঞানিক কর্মকর্তা		০১৭৮৪১১৪৭৬০	mobinur@bwmri.gov.bd

ক্রমিক নং	কর্মকর্তার নাম ও পদবী	ফোন (অফিস)	মোবাইল	ই-মেইল নম্বর
	মৃত্তিকা বিজ্ঞান বিভাগ			
৩৩	মোঃ মনোয়ার হোসেন বৈজ্ঞানিক কর্মকর্তা গম প্রজনন বিভাগ		০১৭৩৮০৬১৭৩৮	monoar.hossain@bwmri.gov.bd
৩৪	মোঃ সাইফুল ইসলাম চৌধুরী, সহকারী পরিচালক (হিসাব) হিসাব শাখা		০১৭৩৯৮২৪৬০৭	saif@bwmri.gov.bd
৩৫	মোছাঃ ফিরোজা খাতুন মেডিকেল অফিসার স্বাস্থকেন্দ্র		০১৭৫২১৬৮৮১২	drfiroza@bwmri.gov.bd
৩৬	মোঃ নাজমুল হক সহকারী প্রোগ্রামার আইসিটি শাখা		০১৯২৬৫৩৪১০০	nazmul.haque@bwmri.gov.bd
৩৭	সজল কুমার সহকারী মেইনটেনেন্স ইঞ্জিনিয়ার আইসিটি শাখা		০১৩১৩৩২৫৭৯৪	sajolks136@bwmri.gov.bd
৩৮	রুপালী দাস লাইব্রেরীয়ান		০১৭১৭৯৪৮৯২১	rupalidu921@bwmri.gov.bd

আঞ্চলিক কেন্দ্র, গাজীপুর

ক্রমিক নং	কর্মকর্তার নাম ও পদবী	ফোন (অফিস)	মোবাইল	ই-মেইল নম্বর
৩৯	মোঃ মাহবুবুর রহমান প্রধান বৈজ্ঞানিক কর্মকর্তা ও ভারপ্রাপ্ত কর্মকর্তা, আঞ্চলিক কেন্দ্র, গাজীপুর	০২৪৯২৭০০৮৭	০১৭১৬৫২২২৭৬	mahbubwrc@yahoo.com mmrahman.gaz@bwmri.gov.bd
৪০	ড. মো. মোস্তফা খান উর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা আঞ্চলিক কেন্দ্র, গাজীপুর		০১৭১২০৪৩৬৮৪	mmkhanwrc@yahoo.com
৪১	ড. মো. মাহমুদুল হাসান উর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা আঞ্চলিক কেন্দ্র, গাজীপুর		০১৭১২০৭২৮১৪	mhasanwrc@yahoo.com
৪২	মোহাম্মদ ফরহাদ আমীন উর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা জীব প্রযুক্তি বিভাগ		০১৯১২২৪৮৯৩৫	forhadbari@yahoo.com forhad.amin@bwmri.gov.bd
৪৩	মোঃ সাইদুল ইসলাম খামার তত্ত্বাবধায়ক আঞ্চলিক কেন্দ্র, গাজীপুর		০১৮৭৩৪৪১৬০৪	saydul@bwmri.gov.bd
৪৪	মোঃ আমিনুল ইসলাম প্রশাসনিক কর্মকর্তা আঞ্চলিক কেন্দ্র, গাজীপুর		০১৭১২২২৬৩৫০	aminul.islam@bwmri.gov.bd

আঞ্চলিক কেন্দ্র, রাজশাহী

ক্রমিক নং	কর্মকর্তার নাম ও পদবী	ফোন (অফিস)	মোবাইল	ই-মেইল নম্বর
৪৫	ড. মো. ইলিয়াছ হোসেন মুখ্য বৈজ্ঞানিক কর্মকর্তা ও ভারপ্রাপ্ত কর্মকর্তা আঞ্চলিক কেন্দ্র, রাজশাহী	০২৫৮৮৮৬৬৪৬২	০১৭১২৬৩২১৬৭	iliasrwrc@gmail.com ilias@bwmri.gov.bd
৪৬	ড. মো. মাহবুবুর রহমান উর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা আঞ্চলিক কেন্দ্র, রাজশাহী		০১৭১১২৮৯০৯১	mahbubrwrc@yahoo.com mahbub.rahman@bwmri.gov.bd
৪৭	ড. মোঃ নুর আলম উর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা আঞ্চলিক কেন্দ্র, রাজশাহী		০১৭২৪৯২১৯০৪	mnalam79@yahoo.com nur.alam@bwmri.gov.bd
৪৮	মোছাঃ নিলুফার ইয়াসমিন খামার তত্ত্বাবধায়ক আঞ্চলিক কেন্দ্র, রাজশাহী		০১৭৭৩৩৯৫৩১৩	nilufar.yeasmin@bwmri.gov.bd

আঞ্চলিক কেন্দ্র, জামালপুর

ক্রমিক নং	কর্মকর্তার নাম ও পদবী	ফোন (অফিস)	মোবাইল	ই-মেইল নম্বর
৪৯	ড. মো. আসাদুজ্জামান প্রধান বৈজ্ঞানিক কর্মকর্তা ও ভারপ্রাপ্ত কর্মকর্তা আঞ্চলিক কেন্দ্র, জামালপুর	০৯৮১৬৩১৪৭	০১৭১২৯৬৫১২৫	asadagron85@yahoo.com md.asad@bwmri.gov.bd
৫০	ড. মোহাম্মদ মোখলেছুর রহমান উর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা আঞ্চলিক কেন্দ্র, জামালপুর		০১৯১১১৪৯০৫৫	mmokhles1981@gmail.com m.mokhlesur@bwmri.gov.bd
৫১	আকাশ আহমেদ খান বৈজ্ঞানিক কর্মকর্তা আঞ্চলিক কেন্দ্র, জামালপুর		০১৮৪৩৬৪৬৫৭৬	akash.khan@bwmri.gov.bd
৫২	মোঃ দেলোয়ার হোসেন খামার তত্ত্বাবধায়ক আঞ্চলিক কেন্দ্র, জামালপুর		০১৭২৬২৪৬৭৪১	dalour@bwmri.gov.bd

আঞ্চলিক কেন্দ্র, যশোর

ক্রমিক নং	কর্মকর্তার নাম ও পদবী	ফোন (অফিস)	মোবাইল	ই-মেইল নম্বর
৫৩	ড. মোঃ আলমগীর মিয়া মুখ্য বৈজ্ঞানিক কর্মকর্তা ও ভারপ্রাপ্ত কর্মকর্তা, আঞ্চলিক কেন্দ্র, যশোর		০১৭৫৯৩০৯১৫০	alamgir_magura@yahoo.com alamgir7632@gmail.com alamgir.miah@bwmri.gov.bd
৫৪	রবিউল ইসলাম উর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা আঞ্চলিক কেন্দ্র, যশোর	০৪২১৬১০৫৯	০১৭১৬০৬৮৩৪৬	rabiwrcjess@yahoo.com rabiul.islam@bwmri.gov.bd
৫৫	শারমিন সুলতানা বৈজ্ঞানিক কর্মকর্তা আঞ্চলিক কেন্দ্র, যশোর		০১৮৪৬৯৮৫৫৪৮	sharmin.sultana@bwmri.gov.bd

৫৬	মোঃ মোস্তফা কামাল সোহেল বৈজ্ঞানিক কর্মকর্তা আঞ্চলিক কেন্দ্র, যশোর		০১৭৯২৩৮৩৫৩৪	mksohel@bwmri.gov.bd
৫৭	মোঃ ফারুকুল ইসলাম খামার তত্ত্বাবধায়ক আঞ্চলিক কেন্দ্র, যশোর		০১৭৯৬৪৫৯৩৭৪	faruqul_02@bwmri.gov.bd

বীজ উৎপাদন কেন্দ্র, দেবীগঞ্জ , পঞ্চগড়

ক্রমিক নং	কর্মকর্তার নাম ও পদবী	ফোন (অফিস)	মোবাইল	ই-মেইল নম্বর
৫৮	ড. মোঃ জাহেরুল ইসলাম উর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা গম প্রজনন বিভাগ		০১৭১৫৫২৪১২৬	mdzaherul7704@gmail.com zaherul.islam@bwmri.gov.bd
৫৯	সরোয়ারদী হোসেন বৈজ্ঞানিক কর্মকর্তা বীজ উৎপাদন কেন্দ্র, দেবীগঞ্জ		০১৭২৪৬৬৬২২৯	Sorowardi@bwmri.gov.bd

বীজ উৎপাদন উপকেন্দ্র, ঠাকুরগাঁও

ক্রমিক নং	কর্মকর্তার নাম ও পদবী	ফোন (অফিস)	মোবাইল	ই-মেইল নম্বর
৬০	ড. মোঃ জাহেরুল ইসলাম উর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা গম প্রজনন বিভাগ		০১৭১৫৫২৪১২৬	mdzaherul7704@gmail.com zaherul.islam@bwmri.gov.bd

মানবসম্পদ উন্নয়ন

১. প্রশিক্ষণ:

ক্র: নং	প্রশিক্ষণ				
	অভ্যন্তরীণ	বৈদেশিক	ইন-হাউজ	অন্যান্য	মোট
১	২	৩	৪	৫	৬
	২১	৭	১০	১১	২৮
মোট	২১	৭	১০	১১	২৮

২. বৈদেশিক সেমিনার/ওয়ার্কশপ/এক্সপোজার ভিজিট:

ক্র: নং	বিদেশ প্রশিক্ষণ			
	সেমিনার	ওয়ার্কশপ	এক্সপোজার ভিজিট	মোট
১	২	৩	৪	৫
		৯		৯
	মোট	৯		৯

৩. উচ্চশিক্ষা:

ক্র: নং	প্রতিবেদনাধীন বছরে উচ্চশিক্ষায় প্রেরণ			মোট উচ্চশিক্ষারত		
	এমএস/এমএসসি/এমফিল	পিএইচডি	মোট	এমএস/এমএসসি/এমফিল	পিএইচডি	মোট
১	২	৩	৪	৫	৬	৭
		১	১		২	২
	মোট	১	১		২	২

প্রতিবেদনাধীন অর্থবছরে (২০২২-২৩) সম্পাদিত উল্লেখযোগ্য কার্যাবলি

১. বাংলাদেশ গম ও ভুট্টা গবেষণা ইনস্টিটিউট ২০২২-২৩ অর্থ-বছরে বিডাব্লিউএমআরআই গম ৪ নামে গমের ১ টি জাত অবমুক্ত করা হয়েছে এ

২. জাত বহির্ভুত ২ টি প্রযুক্তি (ভুট্টা ফসলে ফল আর্মিওয়ার্ম দমন ব্যবস্থাপনা, বিডাব্লিউএমআরআই গম ৪ এর আধুনিক উৎপাদন কলাকৌশল) উদ্ভাবন করা হয়েছে ।

৩. রবি (২০২২-২৩) মৌসুমে গমের বিভিন্ন জাতের ৫৬.৮ মে. টন প্রজনন বীজ, ৫২.৮ টন মানঘোষিত বীজ (টিএলএস) এবং ৫.৭ মে. টন নিউক্লিয়াস বীজ উৎপাদন করা হয়েছে। একই সময় ৫৭.০ মে টন প্রজনন বীজ, ৫৬.০ মে.টন মানঘোষিত বীজ বিক্রয় এবং বিএডিসি সহ অন্যান্য প্রতিষ্ঠানে বিতরন করা হয়েছে।

৪. গমের জাত প্রদর্শনীর জন্য কৃষকদেরকে গম উৎপাদন ও বীজ সংরক্ষণের উপর প্রশিক্ষণ প্রদান, সার ও বীজ বিতরণ করা হয়েছে।

৫. খরিফ ১(২০২২) ও রবি (২০২২-২৩) মৌসুমে উৎপাদিত বিভিন্ন হাইব্রিড ও ইনব্রিড জাতের ভুট্টার ১.৬৮মে. টন প্রজনন বীজ, ২.৭ মে.টন মানঘোষিত বীজ (টিএলএস) উৎপাদন করা হয়েছে।

৬. চলতি মৌসুমে ভুট্টার ০.৫১ মে.টন প্রজনন বীজ, ৪.৭১ মে.টন মানঘোষিত বীজ বীজ প্রদর্শনীর জন্য কৃষকের মাঝে বিতরণ করা হয়েছে।

৭. ভুট্টার হাইব্রিড বীজ উৎপাদনের জন্য বিএডিসিকে প্যারেন্ট লাইনের বীজ সরবরাহ করা হয়েছে।

৮. ২৩৯০ জন কৃষক/কৃষাণী ও সম্প্রসারণ কর্মীদেরকে গম ও ভুট্টার জাত ও প্রযুক্তি বিষয়ে প্রশিক্ষণ প্রদান করা হয়েছে।

৯. ৯টি সেমিনার/ওয়ার্কশপ এর মাধ্যমে ৫১৮ জনকে উদ্ভাবিত প্রযুক্তি সম্পর্কে অবহিত করা হয়েছে।

১০. ২৪ টি মাঠ দিবসের মাধ্যমে ১৯৯০ জন কৃষককে গম ও ভুট্টার আধুনিক উৎপাদন প্রযুক্তি সম্পর্কে অবহিত করা হয়েছে।

১১. উদ্ভাবিত প্রযুক্তি হস্তান্তরের লক্ষ্যে গমের ১৭৫৬ টি ও ভুট্টার ১৬ টি প্রদর্শনী স্থাপন করা হয়েছে।

১২. বাংলাদেশ কৃষি গবেষণা ইনস্টিটিউট (BARI) এর সাথে গবেষণা উন্নয়ন এবং প্রযুক্তি হস্তান্তর সম্পর্কিত সমঝোতা স্মারক স্বাক্ষরিত হয়েছে।

১৩. প্রযুক্তি হস্তান্তর ও প্রচার কাজে সহায়তার জন্য মোট ১৮৫০০ কপি পোস্টার/বুকলেট/ফ্যাক্টশিট/লিফলেট/বিজ্ঞপ্তি মূদ্রণ করা হয়েছে। । এ সময়ে ৮২৭৯৬ জন কৃষি বিষয়ে ই-তথ্য সেবা গ্রহণ করেছেন ।

ছবিঃ বাংলাদেশ গম ও ভুট্টা গবেষণা ইনস্টিটিউট এর মহাপরিচালক ড. গোলাম ফারুক মাননীয় কৃষি মন্ত্রীর নিকট থেকে শুদ্ধাচার চর্চার স্বীকৃতিস্বরূপ 'শুদ্ধাচার পুরস্কার ২০২২-২৩' গ্রহণ করছেন

ছবিঃ গমের নতুন জাত বিডাব্লিউএমআরআই গম ৪

ছবিঃ গমের প্রজনন বীজ উৎপাদন মাঠ (বারি গম ৩২)

ছবিঃ বিভিন্ন দূর্যোগ মোকাবেলায় কৃষকদের মাঝে বিনামূল্যে গম/ভুট্টার বীজ বিতরণ

ছবিঃ গমের নতুন জাতসমূহের প্রাদর্শনীর উপর কৃষক ও সংশ্লিষ্টদের প্রশিক্ষণ ও কিট বিতরণ

ছবিঃ বাংলাদেশে গম ও ভুট্টার বর্তমান অবস্থা, চ্যালেঞ্জ ও ভবিষ্যৎ করণীয় শীর্ষক কর্মশালা ২০২৩

ছবিঃ গমের নতুন জাত ও উৎপাদন কলাকৌশল প্রদর্শনের উপর মাঠ দিবস ২০২৩


ছবিঃ বিডাব্লিউএমআরআই হাইব্রিড ভুট্টার জাত প্রদর্শণী উপলক্ষ্যে আয়োজিত মাঠ দিবস

ছবিঃ প্রদর্শনীর মাধ্যমে গমের নতুন জাতসমূহের সম্প্রসারণ

ছবিঃ প্রদর্শনীর মাধ্যমে ভুট্টার নতুন জাতসমূহের সম্প্রসারণ

ছবিঃ কৃষি সম্প্রসারণ অধিদপ্তরের কৃষকদের উদ্বুদ্ধকরণ ভ্রমণে বাংলাদেশ গম ও ভুট্টা গবেষণা ইনস্টিটিউট এ আগমন

ছবিঃ বাংলাদেশ কৃষি গবেষণা ইনস্টিটিউট ও বাংলাদেশ গম ও ভুট্টা গবেষণা ইনস্টিটিউটের মধ্যকার সমঝোতা স্মারক স্বাক্ষর

ছবিঃ বাংলাদেশ গম ও ভুট্টা গবেষণা ইনস্টিটিউট কর্তৃক মুদ্রিত লিফলেট ও বুকলেট

উন্নয়ন প্রকল্প ও কর্মসূচি সংক্রান্ত

১. প্রতিবেদনাধীন অর্থ বছরে (২০২২-২৩) বাস্তবায়নাধীন উন্নয়ন প্রকল্পসমূহের জুন ২০২৩ পর্যন্ত অগ্রগতি

ক্রম	প্রকল্পের নাম ও প্রকল্পের মেয়াদ কাল	প্রাক্কলিত ব্যয় (কোটি টাকায়)	আরএডিপি বরাদ্দ ২০২২-২৩ (কোটি টাকায়)	অগ্রগতি (কোটি টাকায়)			
				চলতি বছর (জুন ২০২৩ পর্যন্ত)		প্রকল্প শুর থেকে ক্রমপুঞ্জিত	
				আর্থিক (%)	বাস্তব (%)	আর্থিক (%)	বাস্তব (%)
১	২	৩	৪	৫	৬	৭	৮
	গমের ব্লাস্ট রোগপ্রতিরোধ ব্যবস্থাপনা এবং গমের নতুন জাতের বীজ উৎপাদন বৃদ্ধিকরণ। জানুয়ারী ২০২১ হতে অক্টোবর ২০২৩	২.৩৯	০.৫০	০.৫০	১০০	২.৩৪	১০০

২. প্রতিবেদনাধীন অর্থ বছওে কর্মসূচিসমূহের (২০২২-২৩) বাস্তবায়নাধীন বরাদ্দ, অর্থ ছাড় ও ব্যয় (জুন/২৩) এর হিসাব বিবরণী:

(লক্ষ টাকায়)

ক্র:ম:	কর্মসূচির নাম	মেয়াদকাল	কর্মসূচির মোট বরাদ্দ	২০২২-২৩ অর্থ বছরের কর্মসূচিসমূহের বরাদ্দ, অর্থ ছাড় ও অগ্রগতি						জুন/২৩ পর্যন্ত ক্রমপুঞ্জিত ব্যয়		
				বরাদ্দ	মোট ছাড়কৃত অর্থ	জুন/২২ পর্যন্ত ব্যয়	ছাড়কৃত অর্থের অগ্রগতি (%)	বরাদ্দকৃত অর্থের অগ্রগতি (%)	ভৌত অগ্রগতি (%)	সর্বমোট ব্যয়	আর্থিক অগ্রগতি (%)	ভৌত অগ্রগতি (%)
১	২	৩	৪	৫	৬	৭	৮	৯	১০	১১	১২	১৩
১	অপ্রচলিতপ্রতিকুল এলাকায় আধুনিকপ্রযুক্তিপ্রয়োগে নতুন জাতের গম উৎপাদন বৃদ্ধিকরণ।	জুলাই/২০-জুন/২৩	১০৯.৮০	৩৭.২০	৩৬.৩৫	৩৬.৩৫	১০০	৯৭.৭১	১০০	১০৭.৯৫	৯৯.২২	১০০
২	ফল আর্মিওয়ার্ম পোকা দ্বারা ভুট্টা ফসলের ক্ষতি নিরূপন এবং এর পরিবেশ বান্ধব দমন ব্যবস্থাপনা উন্নয়ন	জুলাই/২১-জুন/২৪	৩৬২.৬০	১৫৯.২০	১৪২.৬৯	১৪২.৬৯	১০০	৮৯.৬২	১০০	২১০.১৪	৫৮	৫৮
৩	রাজশাহী, রংপুর ও দিনাজপুর অঞ্চলে নতুন জাতের গম ও ভুট্টার উৎপাদন বৃদ্ধিকরণ ও সম্প্রসারণ	জুলাই/২১-জুন/২৪	৪৫০.০০	২৫৫.৩৮	২৩৫.২৪	২৩৫.২৪	১০০	৯২.১১	১০০	২৫২.৪৫	৫৬.২০	৭৫
৪	লবণাক্ত সহিষ্ণু গম ও ভুট্টার জাত উন্নয়ন এবং লবণাক্ত এলাকায় গম ও ভুট্টার উৎপাদন বৃদ্ধিকরণ	জুলাই/ ২০২২ - জুন/২০২৫	১৫০.০০	২.০০	১.৫০	১.৫০	১০০	৭৫	৭৫	১.৫০	১	১
৫	বাংলাদেশে স্পীড ব্রিডিং পদ্ধতির মাধ্যমে অতিদ্রুত গমের জাত উদ্ভাবন ও সম্প্রসারণ কর্মসূচী	জুলাই/ ২০২২ - জুন/২০২৫	৩৫০.০০	২.০০	১.৫০	১.৫০	১০০	৭৫	৭৫	১.৫০	০.৪০	০.৪০

উদ্ভাবিত ও অবমুক্তকৃত জাতের তথ্যঃ

প্রতিষ্ঠান	উদ্ভাবিত ও অবমুক্ত জাতের সংখ্যা	জাতের নাম	বৈশিষ্ট্য
১	২	৩	৪
বাংলাদেশ গম ও ভুট্টা গবেষণা ইনস্টিটিউট	১	বিডাব্লিউএমআরআই গম ৪	● জাতটি আগাম, তাপ সহিষ্ণু ও লবনাক্ততা সহিষ্ণু (১০ ডিএস/মি. মাত্রার লবনাক্ততা সহ্য করতে পারে); ● গাছের উচ্চতা ৯০-১০০ সেন্টিমিটার; কুশি সংখ্যা ৪-৬ টি; ● শীষ বের হতে ৫৩-৫৭ দিন এবং বোনা থেকে পাকা পর্যন্ত ১০২-১০৭ দিন সময় লাগে; ● শীষ খাটো এবংপ্রতি শীষে দানার সংখ্যা ৩৮-৪৪টি; ● দানার রং সাদা, চকচকে ও আকারে মাঝারি (হাজার দানার ওজন ৪৮-৫৩ গ্রাম); ● গমের পাতার দাগ রোগ এবং মরিচা রোগ প্রতিরোধী; ● উপযুক্ত পরিবেশে হেক্টরপ্রতি ফলন ৪০০০-৫৫০০ কেজি।

উদ্ভাবিত প্রযুক্তির তথ্যঃ

প্রতিষ্ঠান	উদ্ভাবিত প্রযুক্তির নাম	প্রযুক্তির সংক্ষিপ্ত বর্ণনা
১	২	৩
বাংলাদেশ গম ও ভুট্টা গবেষণা ইনস্টিটিউট	ভুট্টা ফসলে ফল আর্মিওয়ার্ম দমন ব্যবস্থাপনা	ফল আর্মিওয়ার্ম ভুট্টার অত্যন্ত ক্ষতিকর পোকা যা গাছের কচি পাতা ও কচি মোচার ভিতরের ভুট্টার দানা খেয়ে ২৫-৩০% ফলন হ্রাস করতে পারে। এ পোকা দমনের জন্য প্রথমে সায়ানট্রানিপ্রিল গ্রুপের কীটনাশক দিয়ে (২.৫মিলি/কেজি বীজ হিসেবে) বীজ শোধন করে ভুট্টা বীজ বপন করতে হবে। ৩০ দিন পর যদি এ পোকার আক্রমন শতকরা ২০টি গাছের অধিক হয় তবে এসএফএনপিভি নামক জৈব বালাইনাশক (০.৩৩মিলি/১লি পানি হিসেবে) দিনের শেষভাগে রবি মৌসুমে ৭-১০দিন পর পর ২-৩ বার এবং খরিফ মৌসুমে ৪-৫ দিন পর পর ৩-৪ বার প্রয়োগ করতে হবে। আক্রমণের মাত্রা অধিক হলে ক্লোরানট্রানিলিপ্রল/স্পিনোসাড /বেল্ট/এমামেকটিন বেনজোয়েট ইত্যাদি গ্রুপের কীটনাশক বোতলের গায়ে লেবেল অনুসারে প্রয়োগ করতে হবে।

	বিডাব্লিউএমআরআই গম ৪ এর আধুনিক উৎপাদন কলাকৌশল	জাতটি বপনের উপযুক্ত সময় নভেম্বর মাসের ১৫ থেকে ৩০ পর্যন্ত (অগ্রহায়ণ মাসের ১ম থেকে ২য় সপ্তাহ পর্যন্ত । তবে জাতটি আগাম ও তাপসহনশীল হওয়ায় ডিসেম্বর মাসের ১৫-২০ তারিখ পর্যন্ত বুনলেও ভাল ফলন দেয়। বীজের পরিমান: গজানোর ক্ষমতা শতকরা ৮০ ভাগ ও তার বেশি হলে হেক্টর প্রতি ১২০ কেজি বীজ ব্যবহার করতে হবে। বীজ শোধন: প্রোভক্স-২০০ নামক ছত্রাকনাশক (প্রতি কেজি বীজে ৩ গ্রাম হারে) মিশিয়ে বীজ শোধন করতে হবে। বীজ শোধন করলে ফলন শতকরা ১০-১২ ভাগ বৃদ্ধি পাবে। বপন পদ্ধতি: সারিতে অথবা ছিটিয়ে গম বীজ বপন করা যায়। সারিতে বপনের জন্য জমি তৈরীর পর ছোট লাঙ্গল বা বীজ বপন যন্ত্রের সাহায্যে ২০ সেমি বা ৮ ইঞ্চি দুরে দুরে সারিতে এবং ৪-৫ সেমি গভীরে বীজ বুনতে হবে সার প্রয়োগ: জমি চাষের শুরুতে হেক্টরপ্রতি ৫-১০ টন গোবর/কম্পোষ্ট জৈব সার হিসেবে ব্যবহার করা উত্তম। শেষ চাষের পূর্বে জমিতে হেক্টরপ্রতি ১৫০-১৭৫ কেজি ইউরিয়া, ১৩৫-১৫০ কেজি টিএসপি, ১০০-১১০ কেজি পটাশ ও ১১০-১২৫ কেজি জিপসাম সার সমান ভাবে ছিটিয়ে চাষ ও মই দিয়ে মাটির সাথে মিশিয়ে দিতে হবে। চারার তিন পাতা বয়সে প্রথম সেচের পর দুপুর বেলা মাটি ভেজা থাকা অবস্থায় প্রতি হেক্টরে ৭৫-৯০ কেজি ইউরিয়া উপরিপ্রয়োগ করতে হবে। প্রতি হেক্টরে ৬.৫ কেজি হারে বরিক এসিড শেষ চাষের সময় অন্যান্য রাসায়নিক সারের সাথে প্রয়োগ করতে হবে। জমিতে অম্লীয় মাত্রা ৫.৫ এর নিচে হলে হেক্টরপতি ১০০০ কেজি হারে ডলোচুন গম বপনের কমপক্ষে দু'সপ্তাহ আগে প্রয়োগ করতে হবে। প্রতি ৩ বছরে একবার ডলোচুন প্রয়োগ করতে হবে। সেচ প্রয়োগ: মাটির প্রকার ভেদে গম আবাদে ২-৩টি সেচের প্রয়োজন হয়। প্রথম সেচ চারার তিন পাতার সময় (বপনের ১৭-২১ দিন পর) দ্বিতীয় সেচ শীষ বের হওয়ার সময় (বপনের ৫০-৫৫ দিন পর) এবং তৃতীয় সেচ দানা গঠনের সময় (বপনের ৭৫-৮০ দিন পর) দিতে হবে। অন্যান্য পরিচর্যা: বীজ বপনের পর ১০-১২ দিন পর্যন্ত পাখি তাড়ানোর ব্যবস্থা রাখতে হবে যাতে বীজ বা চারার সংখ্যা সঠিক থাকে। বপনের ২৫-৩০ দিনের মধ্যে জমিতে 'জো' অবস্থায় আগাছা দমনের জন্য নিড়ানী দিতে হবে। চওড়া পাতা জাতীয় আগাছা (বথুয়া ও কাকরি) দমনের জন্য হ্যামার জাতীয় আগাছা নাশক প্রতি ১৫ লিটার পানিতে ৫মিলি ভাল ভাবে মিশিয়ে মেঘমুক্ত দিনে ১২ শতাংশ জমিতে একবার প্রয়োগ করতে হবে । সময় মত আগাছা দমন করলে ফলন শতকরা ১৫ ভাগ বৃদ্ধি পায়। ক্ষেতে ইঁদুরের আক্রমন শুরু হলে ফাঁদ পেতে বা বিষটোপ (জিঙ্ক ফসফাইড বা ল্যানিরেট) দিয়ে দমন করতে হবে। গমের ব্লাস্ট ও অন্যান্য রোগ দমনের জন্য প্রতিরোধক ব্যবস্থা হিসেবে শীষ বের হওয়ার সময় একবার এবং তার ১২-১৫ দিন পর আরেকবার ফলিকুর, নাটিভো ৭৫ ডাব্লিউ জি, ইত্যাদি ছত্রাকনাশক অনুমোদিত মাত্রায় পানিতে মিশিয়ে ভালভাবে স্প্রে করতে হবে।

বীজ উৎপাদন কার্যক্রমের তথ্য:

নিউক্লিয়াস (২য় বর্ষের লাইন) বীজ উৎপাদন ২০২২-২৩:

প্রতিবছর গমের যথাযথ মানের প্রজনন বীজ উৎপাদন কার্যক্রম নিশ্চিতকরণের লক্ষে নিউক্লিয়াস বীজ উৎপাদন করা হয়ে থাকে। ২০২২-২৩ বছরে গমের ৮ টি জাতের মোট ৫৬৮৬ কেজি নিউক্লিয়াস বীজ উৎপাদন করা হয়েছে। তন্মধ্যে গ্রেড-১ মানের নিউক্লিয়াস

বীজ ৪৬৮১ কেজি এবং গ্রেড-২ মানের নিউক্লিয়াস বীজ ১০০৫ কেজি।

ক্র. নং	জাত	নিউক্লিয়াস বীজ (কেজি)		
		গ্রেড-১	গ্রেড-২	মোট
১	বারি গম ২৫	৪৫৭	-	৪৫৭
২	বারি গম ৩	৬১৯	১৭৯	৭৯৮
৩	বারি গম ৩২	৪৯১	১০	৬০১
৪	বারি গম ৩৩	১,৪২	২৩৩	১,৬৩৫
৫	BWMRI গম ১	৩৪৪	২২০	৫৬৪
৬	BWMRI গম ২	৫৫৪	১৩৬	৬৯০
৭	BWMRI গম ৩	৩৬১	-	৩৬১
৮	BWMRI গম ৪	৪৫৩	১২৭	৫৮০
সর্বমোট		**৪,৬৮১**	**১,০০৫**	**৫,৬৮৬**

* সর্বশেষ আপডেট ২৫/০৫/২০২৩ খ্রি.

প্রজনন বীজ উৎপাদন ২০২২-২৩:

বাংলাদেশ গম ও ভুট্টা গবেষণা ইনস্টিটিউট কর্তৃক প্রতিবছর গমের বিভিন্ন জাতের প্রজনন বীজ উৎপাদন করা হয়ে থাকে। উৎপাদিত প্রজনন বীজ, ভিত্তি বীজ তৈরীর জন্য বিএডিসি ও অন্যান্য বেসরকারী বীজ উৎপাদনকারী প্রতিষ্ঠানকে সরবরাহ করা হয়। ২০২২-২৩ অর্থবছরে গমের ৬ টি জাতের মোট ৫৬,৮০৯ কেজি প্রজনন বীজ উৎপাদন করা হয়েছে। এছাড়া হাইব্রিড জাতের ভুট্টার ৪ টি প্যারেন্ট লাইনের ও ২ টি কম্পোজিট জাতের ভুট্টার মোট ১,৬৮০ কেজি প্রজনন বীজ উৎপাদন করা হয়েছে।

গমের প্রজনন বীজ উৎপাদন এর তথ্য

ক্র. নং	জাত	প্রজনন বীজ (কেজি)			
		দিনাজপুর	পঞ্চগড়	ঠাকুরগাঁও	**মোট**
১	বারি গম ৩০	৪,৬৭০	৭,৫০৫	-	**১২,১৭৫**
২	বারি গম ৩	৩,৬১০	৭,৮৮৫	-	**১১,৪৯৫**
৩	বারি গম ৩৩	-	১৫,৭৭৮	৭,১০০	**২২,৮৭৮**
৪	BWMRI গম ১	২,৯১০		-	**২,৯১০**
৫	BWMRI গম ২	৫,৪৫১	-	-	**৫,৪৫১**
৬	BWMRI গম ৩	১,৯০০	-	-	**১,৯০০**
সর্বমোট		**১৮,৫৪১**	**৩১,১৬৮**	**৭,১০০**	**৫৬,৮০৯**

* সর্বশেষ আপডেট ১০/০৭/২০২৩ খ্রি.

ভুট্টার বীজ উৎপাদন এর তথ্য

ক্র. নং	জাত	প্যারেন্ট/প্রজনন বীজ (কেজি)						
		দিনাজপুর	পঞ্চগড়	ঠাকুরগাঁও	রাজশাহী	জামালপুর	যশোর	**মোট**
১	BIL ২৮	৫০০	-	-	-	-	-	**৫০০**
২	BIL ২১৫	৫০	-	-	-	-	-	**৫০**
৩	BIL ২১৭	-	-	-	-	-	১০০	**১০০**
৪	BML ২৬৪	-	-	১৭০	৬০	-	-	**২৩০**
৫	বারি মিষ্টি ভুট্টা ১	-	২০০	-	-	-	-	**২□০**
৬	খই ভুট্টা	-	-	-	-	৬০০	-	**৬০০**
সর্বমোট		**৫৫০**	**২০০**	**১৭০**	**৬০**	**৬□০**	**১০০**	**১,৬□০**

মানঘোষিত বীজ (টিএলএস) উৎপাদন ২০২২-২৩:

বাংলাদেশ গম ও ভুট্টা গবেষণা ইনস্টিটিউট গমের প্রজনন বীজ উৎপাদনের পাশাপাশি কৃষক পর্যায়ে বিতরনের জন্য প্রতিবছর গমের বিভিন্ন জাতের মানঘোষিত বীজ উৎপাদন করে থাকে। ২০২২-২৩ অর্থবছরে বাংলাদেশ গম ও ভুট্টা গবেষণা ইনস্টিটিউট এর বিভিন্ন কেন্দ্র ও কৃষকের মাঠে গমের ৯ টি জাতের মোট ৫২৭৫০ কেজি মানঘোষিত বীজ উৎপাদন করা হয়েছে।

মানঘোষিত বীজ (টিএলএস) উৎপাদন ২০২২-২৩

ক্র. নং	জাত	মানঘোষিত বীজ (কেজি)									
		দিনাজপুর	দেবীগঞ্জ	রাজশাহী	গাজীপুর	জামালপুর	যশোর	অন-ফার্ম	FAO	CIMMYT	**মোট**
১	বারি গম ২৫	-		১০০	৩৪০		৩০০	৫৬০			**১,৩০০**
২	বারি গম ৩০	-	৩০০	৪৮০	**১,১৫৫**	৭৩০					**২,৬৬৫**
৩	বারি গম ৩২	-	১,৪৬০	৪৭০	১,৩০৮	৮৮০		২,৯৬৫			**৭,০৮৩**
৪	বারি গম ৩৩	-		১,০৬০	৯৪৩	১,৩৩০	৬৫০	২৩,৭৫৫	২,৪০০	৪৮০	**৩০,৬১৮**
৫	BWMRI গম ১	-		৩২০	৭৯০	৬৬০		১,৯৭০			**৩,৭৪০**
৬	BWMRI গম ২	১৭০		৩৪০	৯৬৪	১,৪৬০					**২,৯৩৪**
৭	BWMRI গম ৩	৪৫০		৬১০			১১০		৬০০	৫০০	**২,২৭০**
৮	BWMRI গম ৪	-					৩০০	১,২৩০			**১,৫৩০**
৯	BWMRI গম ৫*	-				৬১০					**৬১০**
সর্বমোট		**৬২০**	**১,৭৬০**	**৩,৩৮০**	**৫,৫০০**	**৫,৬৭০**	**১,৩৬০**	**৩০,৪৮০**	**৩,০০০**	**৯৮০**	**৫২,৭৫০**

* (প্রস্তাবনাধীন)

সর্বশেষ আপডেট ১০/০৭/২০২৩ খ্রি.

আন্তর্জাতিক সম্পর্ক উন্নয়ন

১. আন্তর্জাতিক সহযোগিতায় উল্লেখযোগ্য কার্যক্রম ও অর্জন:

বিডাব্লিউএমআরআই CIMMYT ও ACIAR এর সহযোগিতায় বাংলাদেশে গমের ব্লাস্ট রোগ মোকাবেলায় কাজ করছে। ইতোমধ্যে বারি গম ৩৩ ও বিডাব্লিউএমআরআই গম ৪ নামে ২টি ব্লাস্ট প্রতিরোধী গমের জাত উদ্ভাবিত হয়েছে। CIMMYT মেক্সিকোতে Wheat Improvement বিষয়ে বিডাব্লিউএমআরআই এর ১জন বিজ্ঞানী ৩ মাসব্যাপী প্রশিক্ষণে অংশগ্রহণ করেছেন। CIMMYT এর সহযোগিতায় ভুট্টার অগ্রবর্তি সারি সংগ্রহ ও মূল্যায়ন কার্যক্রম চলমান রয়েছে। কৃষকের পুষ্টি ও আয় বৃদ্ধির জন্য CIMMYT এর সহযোগিতায় গম ও ভুট্টা ভিত্তিক ফসল বিন্যাস (TAFSSA) বিষয়ে গবেষণা কার্যক্রম চলমান রয়েছে। CIMMYT ও FAO এর সহযোগিতায় ভুট্টার ফল আর্মি ওয়ার্ম পোকা দমন ও ফল আর্মি ওয়ার্ম প্রতিরোধী জাত উদ্ভাবন কার্যক্রম চলমান রয়েছে।

২. সমঝোতা স্মারক স্বাক্ষর

ক্রমিক নং	সমঝোতা স্মারকের নাম/বিষয়	স্বাক্ষরের তারিখ
১	২	৩
১.	Memorandum of Understanding between Bangladesh Agricultural Research Institute (BARI) and Bangladesh Wheat and Maize Research Institute (BWMRI)	২৬/০৬/২০২৩

সুশাসন সংক্রান্ত

১. বার্ষিক কর্মসম্পাদন চুক্তি (এপিএ):

২০২২-২৩ অর্থবছরে বিডাব্লিউএমআরআই এর বার্ষিক কর্মসম্পাদন চুক্তিতে তিনটি কৌশলগত উদ্দেশ্য অর্জনের লক্ষ্যে মোট ৩৫ টি কর্মসম্পাদন সূচকের লক্ষ্যমাত্রা নির্ধারণ করা হয়েছিল। তার মধ্যে ফসলের উৎপাদন ও উৎপাদনশীলতা বৃদ্ধিতে ১৭ টি, কৃষি উপকরণের সহজলভ্যতা ও সরবরাহ বৃদ্ধিকরণে ৮ টি এবং কর্ম ব্যবস্থাপনায় পেশাদারিত্বের উন্নয়নে ১০ টি কর্মসম্পাদন সূচকের সবকটি সূচকে শতভাগ লক্ষ্যমাত্রা অর্জিত হয়েছে।

২.শুদ্ধাচার:

২০২২-২৩ অর্থবছরে বিডাব্লিউএমআরআই-এর জাতীয় শুদ্ধাচার কৌশল কর্মপরিকল্পনায় ৩টি সেকশনের আওতায় মোট ১৫ টি কর্ম সম্পাদন সূচক লক্ষ্যমাত্রা হিসেবে নির্ধারণ করা হয়েছিল। তার মধ্যে প্রাতিষ্ঠানিক ব্যবস্থায় ৬ টি, আর্থিক ব্যবস্থাপনা উন্নয়নে ৫টি এবং শুদ্ধাচার সংশ্লিষ্ট ও দুর্নীতি প্রতিরোধে সহায়ক কার্যক্রমের আওতায় ৪টি কর্ম সম্পাদন সূচকের সব কয়টি সূচকের শতভাগ লক্ষ্যমাত্রা অর্জিত হয়েছে।

৩.ইনোভেশন, সেবা সহজীকরণ ও ডিজিটাল সেবা

ইনোভেশন, সেবা সহজীকরণ ও ডিজিটাল সেবা: বাংলাদেশ গম ও ভুট্টা গবেষণা ইনস্টিটিউট এর ই-গভর্ন্যান্স ও উদ্ভাবন কর্মপরিকল্পনা ২০২২-২৩ এর আওতায় ইতঃপূর্বে বাস্তবায়িত উদ্ভাবনী ধারণা, সহজিকৃত ও ডিজিটাইজকৃত মোট তিনটি সেবার সাথে এ বছর নতুন একটি সেবা(গম ও ভুট্টা বীজের অনলাইন আবেদন) চালু করা হয়েছে। এয়াড়াও কর্মপরিকল্পনা অনুযায়ী ৪র্থ শিল্প বিপ্লবের চ্যালেঞ্জ মোকাবেলায় উক্ত প্রতিষ্ঠানের কর্মপরিকল্পনা প্রনয়ন ও এই সম্পর্কিত ২টি কর্মশালা আয়োজন, ই-গভর্ন্যান্স ও উদ্ভাবন কর্মপরিকল্পনা ২০২২-২৩ বাস্তবায়ন সংক্রান্ত ৪টি প্রশিক্ষণ আয়োজন, ডি-ফাইলে নিষ্পত্তিকৃত নোটের হার বৃদ্ধিকরণ, তথ্য বাতায়ন হালনাগাদকরণ ইত্যাদি কার্যক্রম সম্পাদন সহ কর্মপরিকল্পনার মোট ১২টি কর্মসম্পাদন সূচকের সবকটিতেই শতভাগ লক্ষ্যমাত্রা অর্জিত হয়েছে এবং নির্দিষ্ট সময়ে কর্মপরিকল্পনা বাস্তবায়ন সংক্রান্ত অগ্রগতি প্রতিবেদন কৃষি মন্ত্রনালয়ের সংশ্লিষ্ট বিভাগে প্রেরণ করা হয়েছে।

৪. তথ্য অধিকার আইন:

তথ্য অধিকার আইনের আওতায় ২০২২-২৩ অর্থবছরে ০১টি আবেদন পাওয়া গেছে এবং তা বিধি মোতাবেক নিষ্পত্তি করা হয়েছে। স্বপ্রণোদিতভাবে প্রকাশযোগ্য সকল তথ্য হালনাগাদ করে বার্ষিক প্রতিবেদন ওয়েবসাইটে প্রকাশ করা হয়েছে। তথ্য অধিকার আইন, ২০০৯ এর ৫ ধারা অনুসারে যাবতীয় তথ্যের ক্যাটালগ ও ইনডেক্স তৈরি/হালনাগাদকরণ করা

হয়েছে। তথ্য অধিকার আইন ও বিধি-বিধান সম্পর্কে জনসচেতনতা বৃদ্ধিকরণের লক্ষ্যে তিনটি সভা এবং তথ্য অধিকার আইন ২০০৯ ও এর বিধিমালা, প্রবিধানমালা, স্বপ্রণোদিত তথ্য প্রকাশ নির্দেশিকাসহ সংশ্লিষ্ট বিষয়ে কর্মকর্তা/কর্মচারীদের তিনটি প্রশিক্ষণ আয়োজন করা হয়েছে। তথ্য অধিকার সংক্রান্ত চারটি ত্রৈমাসিক অগ্রগতি প্রতিবেদন নির্ধারিত সময়ে ওয়েবসাইটের তথ্য অধিকার সেবাবক্সে প্রকাশ করা হয়েছে। তথ্য অধিকার বিষয়ে ২০২২-২৩ অর্থ বছরের বার্ষিক কর্ম-পরিকল্পনা অনুযায়ী সকল কাজ শতভাগ সম্পন্ন করা হয়েছে।

৫. সিটিজেন চার্টার:

সেবাপ্রদান যুগোপযোগী ও সহজীকরণের লক্ষ্যে ত্রৈমাসিক ভিত্তিতে সিটিজেন চার্টার হালনাগাদ করা এবং হালনাগাদকৃত সিটিজেন চার্টার ওয়েবসাইটে আপলোড করা হয়েছে। সিটিজেন চার্টার অনুযায়ী সেবাপ্রদান করা হচ্ছে কিনা তা যাচাই করার জন্য সিটিজেন চার্টার পরিবীক্ষণ কমিটি প্রতি ত্রৈমাসিকে একটি সভার আয়োজন করেছে। যাচাইয়ের ভিত্তিতে একটি পরিবীক্ষণ প্রতিবেদন প্রস্তুত কওে মন্ত্রণালয়ে প্রেরণ করা হয়েছে। দৃশ্যমান স্থানে একটি সেবা বক্স স্থাপন করা হয়েছে যেখানে সেবা গ্রহীতাগণ সবুজ ও লাল কার্ডের মাধ্যমে সেবা সম্বন্ধে তাদের সন্তুষ্টি বা অসন্তুষ্টি প্রকাশ করতে পারেন যা নিয়মিত পর্যবেক্ষণ করা হয়। এছাড়াও সিটিজেন চার্টার কর্মপরিকল্পনার লক্ষ্যমাত্রা অনুযায়ী বিভিন্ন সময়ে আওতাধীন দপ্তর/সংস্থার সমন্বয়ে ১টি সভা, সেবা প্রদান প্রতিশ্রুতি বিষয়ক ১টি কর্মশালা এবং সেবাপ্রদান বিষয়ে স্টেকহোল্ডারগণের সমন্বয়ে ১টি অবহিতকরণ সভা আয়োজন করা হয়েছে এবং প্রতিবেদন মন্ত্রণালয়ে প্রেরণ করা হয়েছে। সিটিজেন চার্টার বিষয়ে ২০২২-২৩ অর্থ বছরের বার্ষিক কর্ম-পরিকল্পনা অনুযায়ী সকল কাজ শতভাগ সম্পন্ন করা হয়েছে।

৬. অভিযোগ প্রতিকারের ব্যবস্থা:

বাংলাদেশ গম ও ভুট্টা গবেষণা ইনস্টিটিউট এর অভিযোগ প্রতিকার ব্যবস্থা কর্মপরিকল্পনা ২০২২-২৩ অর্থ বছরে সরাসরি অথবা জিআরএস অনলইন প্লাটফরমের কোনটিতেই অভিযোগ পাওয়া যায়নি এবং কর্মপরিকল্পনার আওতায় কর্মকর্তা/কর্মচারীদের সমন্বয়ে অভিযোগ প্রতিকার ব্যবস্থা এবং জিআরএস সফটওয়্যার বিষয়ক ২টি সেমিনার/কর্মশালা/প্রশিক্ষণ এবং অভিযোগ প্রতিকার ব্যবস্থাপনা বিষয়ে স্টেকহোল্ডারগণের সমন্বয়ে অবহিতকরণ বিষয়ে ২টি সভা সহ কর্মপরিকল্পনার মোট ৬টি কর্মসম্পাদন সূচকের সবকটিতেই শতভাগ লক্ষ্যমাত্রা অর্জিত হয়েছে এবং নির্দিষ্ট সময়ে কর্মপরিকল্পনা বাস্তবায়ন সংক্রান্ত অগ্রগতি প্রতিবেদন কৃষি মন্ত্রনালয়ের সংশ্লিষ্ট বিভাগে প্রেরণ করা হয়েছে।

৭. উত্তম চর্চা:

বিডাব্লিউএমআরআই এর সুশাসন সংক্রান্ত বিভিন্ন কার্যক্রম যেমন বার্ষিক কর্মসম্পাদন চুক্তি (এপিএ); শুদ্ধাচার; ইনোভেশন, সেবা সহজীকরণ ও ডিজিটাল সেবা; তথ্য অধিকার আইনের আওতায় প্রদত্ত সেবাসমূহ, সিটিজেন চার্টারে প্রতিশ্রুত সেবাসমূহ এবং অভিযোগ প্রতিকার ব্যবস্থা সঠিক সময়ে উত্তম চর্চার মাধ্যমে যথাযথভাবে সম্পন্ন করা হচ্ছে।

Research Abstracts 2022-23

PROJECT 1. WHEAT VARIETY DEVELOPMENT

The main objective of this program is to develop high-yielding bread wheat, durum wheat, and triticale varieties with tolerance/resistance to biotic and abiotic stresses, as well as a wide range of adaptability, to enhance wheat productivity in Bangladesh. The development of early maturing, heat-tolerant, wheat blast, BpLB, and leaf rust resistant/tolerant varieties has been given the highest research priority in the context of global climate change. Due emphasis has also been placed on developing varieties resistant to other abiotic stresses such as drought, salinity, boron deficiency, etc. Genetic improvement by incorporating adaptive stress traits into the good agronomic background is a significant focus of the variety development program. Additionally, research efforts have been directed towards developing varieties with improved nutritional quality. Efficient deployment of resistance genes into genotypes with a good agronomic background for major diseases like leaf rust, Bipolaris leaf blight, stem rust, wheat blast etc., is also considered a priority area. The performance of newly developed wheat lines from national and international sources, especially CIMMYT is being evaluated under different growing environments across the country. Promising lines that demonstrate superiority to the standard check varieties are selected.

Apart from that, BWMRI maintains a unique crossing block containing germplasm from diverse sources, which is utilized for hybridization. Segregating generations are advanced following the selected bulk method. Every year, hundreds of new lines are added to the nurseries/trials for performance evaluation. The wheat research activities on variety development during 2022-23 are described in this report.

Picture 1: *Wheat breeding research field in 2022-23 season at BWMRI headquarter, Dinajpur*

1.1. DEVELOPMENT OF HIGH YIELDING VARIETY

1.1.1. HYBRIDIZATION

MA HAKIM, MZ ISLAM, MR KABIR, AA KHAN, MM HOSSAIN, M FARHAD, MM HOSSAIN Jr., MM RAHMAN(Gaz), MM HASSAN, MF AMIN and MM RHMAN(Jam)

Abstract

The hybridization program has been conducted at three research stations: Dinajpur, Gazipur, and Jamalpur. A total of 784 single and 179 top crosses in which 150 crosses were targeted to blast resistance, 95 crosses were targeted to salt tolerance were made this year to incorporate the desired genes in the adapted genotypes. The crosses made will be confirmed in next year.

Picture 2: *Wheat Crossing Block of 2022-23 season at the BWMRI headquarter, Dinajpur*

Picture 3: *Making crosses by wheat breeder in the crossing block*

1.1.2. CONFIRMATION AND SELECTION IN F1 GENERATION

MA HAKIM, MZ ISLAM, MR KABIR, AA KHAN, MM HOSSAIN, M FARHAD, MM RAHMAN(Gaz), MM HASSAN, MF AMIN and MM RHMAN(Jam)

Abstract

On the basis of phenotypic expression of hybrids with comparison of their respective female parents 644 F1 populations derived from single crosses were confirmed as hybrids. In addition, 162 Top cross and 26 Back cross F1 populations were also confirmed.

1.1.3. EVALUATION AND SELECTION IN DIFFERENT FILIAL GENERATIONS

MA HAKIM, MZ ISLAM, MR KABIR, AA KHAN, MM HOSSAIN, M FARHAD, MM RAHMAN(Gaz), MM HASSAN, MF AMIN and MM RHMAN(Jam)

Abstract

Selected bulk method was followed during selection in F2 to F4 segregating generations. In F5 pedigree method was followed. Selections were based on good vigor, earliness, medium height, disease and sterility tolerance and resistance, etc. The F2 families were thoroughly evaluated in the field and 351 families were selected out of 571. 146 F3 families and 96 F4 families were selected out of 186 and 116 families, respectively. A total of 84 F5 families were selected from 117 families from where 449 individual plants were selected based on field performance and their ideotypes. Eighty-eight F6 families out of 234 were selected for inclusion them in Bangladesh Wheat Screening Nursery (BWSN) for next season.

1.1.4. GERMPLASM MAINTENANCE

MA HAKIM, MZ ISLAM, MR KABIR, AA KHAN, MSN MANDAL, MA MAMUN, MM HOSSAIN, M FARHAD and MM HOSSAIN jr

Abstract

Germplasm collection is maintained in germplasm observation nursery. A total of 212 wheat genotypes were included in this nursery. These materials were collected from different national and international nurseries with special characteristics and are being maintained for future use.

Picture 4: *On-station demonstration of BWMRI developed wheat varieties*

1.1.5. BANGLADESH WHEAT SCREENING NURSERY-I (BWSN-I)

MR KABIR, MA HAKIM, MM HOSSAIN, M FARHAD, MM HOSSAIN jr, MM RAHMAN (Gaz), MF AMIN, MAA MAMUN, AA KHAN, MM RAHMAN(Jam), and MR ISLAM

Abstract

Forty-eight genotypes along with two check varieties Shatabdi and BWMRI Gom 3 were evaluated in this nursery at Bangladesh Wheat and Maize Research Institute, Dinajpur, Gazipur and Jashore under irrigated timely sown (ITS) and irrigated late sown (ILS) conditions. There was significant difference in yield and other characters between two seeding dates. The genotypes showed significant variation for all the traits. Based on overall performances, 14 genotypes viz. E-11, E-12, E-14, E-20, E-26, E-

30, E31, E-32, E-34, E-35, E37, E-38, E-45, and E-46 were selected for inclusion in PYT next year. The selected genotypes had high yield, bold and plump grains with better tolerance to blast and Bipolaris leaf blight (BpLB) and resistant to leaf rust diseases.

1.1.6. BANGLADESH WHEAT SCREENING NURSERY-II (BWSN-II)

MM RAHMAN(Jam), MA HAKIM, MR KABIR, MSN MANDAL, MM HOSSAIN, M FARHAD, MM HOSSAIN jr., MAA MAMUN, MI HOSSAIN and AA KHAN

Abstract

Sixty genotypes selected from different international nurseries and trials including Shatabdi and BWMRI Gom 3 as local checks were evaluated in this nursery at Bangladesh Wheat and Maize Research Institute, Dinajpur, Jamalpur and Rajshahi under irrigated timely sown (ITS) and irrigated late sown (ILS) conditions. There was significant difference in yield and other characters except for maturity days between two locations. The genotypes showed significant variation for all the traits. Based on overall performances twelve genotypes viz. E-3, E-10, E-15, E-17, E-19, E-23, E-27, E-29, E-30, E-31, E-32 and E-58 were selected for inclusion in PYT next year. The selected genotypes had high yield, bold and plump grains.

1.1.7. BANGLADESH WHEAT SCREENING NURSERY-III (BWSN-III)

MZ ISLAM, MA HAKIM, AA KHAN, MR KABIR, MM HOSSAIN, M FARHAD, MM HOSSAIN jr., MM RAHMAN(Jam) and MN ALAM

Abstract

Sixty-three genotypes selected from different international nurseries and trials along with Shatabdi and BWMRI Gom 3 as local checks were evaluated in this nursery at Bangladesh Wheat and Maize Research Institute, Dinajpur, Jamalpur and Rajshahi under irrigated timely sown (ITS) and irrigated late sown (ILS) conditions. There was significant difference in yield and other characters two seeding dates. The genotypes showed significant variation for all the traits. Based on overall performances twelve genotypes e.g., E-18, E-19, E-27, E-28, E-31, E-35, E-44, E-47, E-49, E-50, E-62 and E-63 were selected for inclusion in PYT next year. The selected genotypes had high yield, bold and plump grains with better tolerance to Bipolaris leaf blight (BpLB) and resistant to leaf rust diseases.

1.1.8. BANGLADESH WHEAT SCREENING NURSERY-IV (BWSN-IV)

R ISLAM, MA HAKIM, AA KHAN, MZ ISLAM, MR KABIR, MM HOSSAIN, M FARHAD, MM HOSSAIN jr and MM RAHMAN

Abstract

Fourty-two genotypes selected from different international nurseries and trials along with Shatabdi and BWMRI Gom 3 as local checks were evaluated in this nursery at Bangladesh Wheat and Maize Research Institute, Dinajpur under irrigated timely sown (ITS) and irrigated late sown (ILS) conditions. There was significant difference in yield and other characters two seeding dates. The genotypes showed significant variation for all the traits. Based on overall performances eleven genotypes e.g., E-3, E-4, E-5, E-6, E-16, E-19, E-20, E-26, E-28, E-31 and E-33 were selected for inclusion in PYT next year. The selected genotypes had high yield, bold and plump grains with better tolerance to Bipolaris leaf blight (BpLB) and resistant to leaf rust diseases.

1.1.9. PRELIMINARY YIELD TRIAL (PYT)

MA HAKIM, MZ ISLAM, MR KABIR, AA KHAN, MM HOSSAIN, M FARHAD, MM HOSSAIN jr, MM RAHMAN, MM HASSAN, MF AMIN AND MR ISLAM

Abstract

Thirty advanced lines along with BARI Gom 30, BARI Gom 32 and BWMRI Gom 2 as checks were evaluated at Bangladesh Wheat and Maize Research Institute, Dinajpur, Gazipur and Jashore in alpha lattice design with two replications under irrigated timely, irrigated late sown conditions. The genotypes were evaluated for yield and yield components, heading, maturity, disease reaction, sterility, visual grain quality, etc. The highest grain yield (6090 kg ha-1) was obtained in BAW 1466

at Dinajpur in ITS condition. The lowest grain yield (1050 kg ha-1) was obtained in BAW 1465 at Jashore under ILS condition. Considering mean performance across location and sowing time, out of thirteen selected genotypes, twelve produced higher grain yield than check variety BWMRI Gom 2 (3520 kg ha-1) The highest TGW (56.5 g) was achieved in BAW 1460 in ITS condition at Jashore. The lowest TGW (17.9 g) was found in BAW 1475 in ILS condition at Jashore. Considering the overall performance, 13 genotypes viz. BAW 1458, BAW 1459, BAW 1460, BAW 1461, BAW 1462, BAW 1464, BAW 1465, BAW 1466, BAW 1467, BAW 1472, BAW 1473, BAW 1474 and BAW 1479 were finally selected for testing in AYT next year.

1.1.10. ADVANCE YIELD TRIAL (AYT)

MZ ISLAM, MA HAKIM, MR KABIR, MSN MANDAL, AA KHAN, MM HOSSAIN, M MZ ISLAM, MA HAKIM, MR KABIR, MSN MANDAL, AA KHAN, MM HOSSAIN, M FARHAD, MM HOSSAIN jr, MM RAHMAN (Gaz), MF AMIN, MM HASSAN, MM RHMAN(Jam), MR ISLAM, MI HOSSAIN, MN ALAM and MG FARUQ

Abstract

Thirteen advanced lines were evaluated against two check varieties, BARI Gom 32 and BWMRI Gom 2 at BWMRI, Dinajpur, Gazipur, Jamalpur, Jashore and Rajshahi in RCB factorial design with three replications. The trial was conducted under irrigated timely sown and irrigated late sown conditions. The genotypes were evaluated for yield and yield components, phenology, disease reaction, visual grain quality, etc. The effect of sowing time, location and genotypes and their interaction was significant for different traits studied. BAW 1433 (3860 kg ha-1), BAW 1436 (3860 kg ha-1), BAW 1429 (3710 kg ha-1), BAW 1434 (3710 kg ha-1), BAW 1435 (3700 kg ha-1), BAW 1438 (3790 kg ha-1), and BAW 1439 (3700 kg ha-1) were out yielded against all the checks across location and sowing time. Among them, BAW 1433, BAW 1436, and BAW 1438 produced statistically higher yields than both checks, BARI Gom 32 and BWMRI Gom 2. The highest yield was achieved in BAW 1439 (5590 kg ha-1) at Dinajpur under ITS condition followed by BAW 1433 (5540 kg ha-1) and BAW 1440 (5510 kg ha-1) at the same location under ITS condition. The lowest yield was recorded in BAW 1430 (1240 kg ha-1) at Jashore under ILS condition. A thousand grain weight of maximum selected genotypes was at par check varieties. Considering the overall yield and other characters, the genotypes BAW 1430, BAW 1433, BAW 1434, BAW 1435, BAW 1436, BAW 1438, and BAW 1439 were finally selected for further evaluation in the candidate variety demonstration trial next year.

1.1.11. CANDIDATE VARIETY DEMONSTRATION (CVD)

MZ ISLAM, MA HAKIM, MR KABIR, MSN MANDAL, AA KHAN, MM HOSSAIN, M FARHAD, MM HOSSAIN jr AND MR ISLAM

Abstract

Ten advanced lines and check varieties BARI Gom 32 and BWMRI Gom 1 were evaluated in CVD under irrigated timely seeding (ITS) and irrigated late seeding (ILS) conditions. The genotypes were evaluated based on yield and yield contributing characters, disease resistance, lodging tolerance, physical grain characteristics etc. Considering overall performance five genotypes BAW 1286, BAW 1340, BAW 1422 and BAW1425 have been selected for same trial and on-farm evaluation in farmers' field next year.

Picture 5: *Field view of few wheat lines in the CVD 2022-23 plots at BWMRI, Dinajpur*

1.2. DEVELOPMENT OF HEAT TOLERANT WHEAT GENOTYPES

1.2.1. EARLY HEAT TOLERANCE WHEAT SCREENING NURSERY (10th EHTWSN)

MM HOSSAIN, MA HAKIM, MZ ISLAM, MSN, MANDAL, MR KABIR, AA KHAN, M FARHAD, AND MM HOSSAIN jr

Abstract

Thirty-nine high yielding spring wheat genotypes including three check varieties BARI Gom 30 and BARI Gom 32 and BWMRI Gom1 were evaluated at Bangladesh Wheat and Maize Research Institute, Dinajpur under early sown condition during Rabi, 2022-23. The experiment was undertaken to study the effect of early heat stress for yield and yield components. Significant variations were observed among the genotypes for all the traits studied. Considering plant stature, phenology, grain characteristics and grain yield nine entries (E-6, E-7, E-8, E-11, E-12, E-16, E-23, E-25 and E-28) were selected for further evaluation in the next year. Among the selected entries E-7 and E-28 were found top yielder with other outstanding characteristics.

1.3. MOLECULAR BREEDING

1.3.1. MOLECULAR SCREENING OF BLAST AND LEAF RUST RESISTANCE WHEAT GENOTYPES USING MOLECULAR MARKERS

M FARHAD, MM HOSSAIN jr, MA HAKIM, MZ ISLAM, MR KABIR, AA KHAN AND MM HOSSAIN

Abstract

Wheat blast and leaf rust are the two important biotic threat in Bangladesh. Several wheat varieties developed in Bangladesh have become susceptible for these two diseases. Therefore, development and dissemination of resistant/tolerant wheat varieties would be the most effective way to control these two fearsome diseases. It has been proven that 2NS translocation from *Aegilops ventricosa* expresses resistance to wheat blast in most background. On the other hand, several Lr genes have been identified to boost the leaf rust resistance in wheat. A total 61 wheat genotypes from CVD, AYT and PYT were screened to find out wheat blast and leaf rust resistance. We used Ventriup-LN2 marker for blast and Lr10, Lr 24, Lr26, Lr34, Lr34(1) for leaf rust screening. Total 24 genotypes have

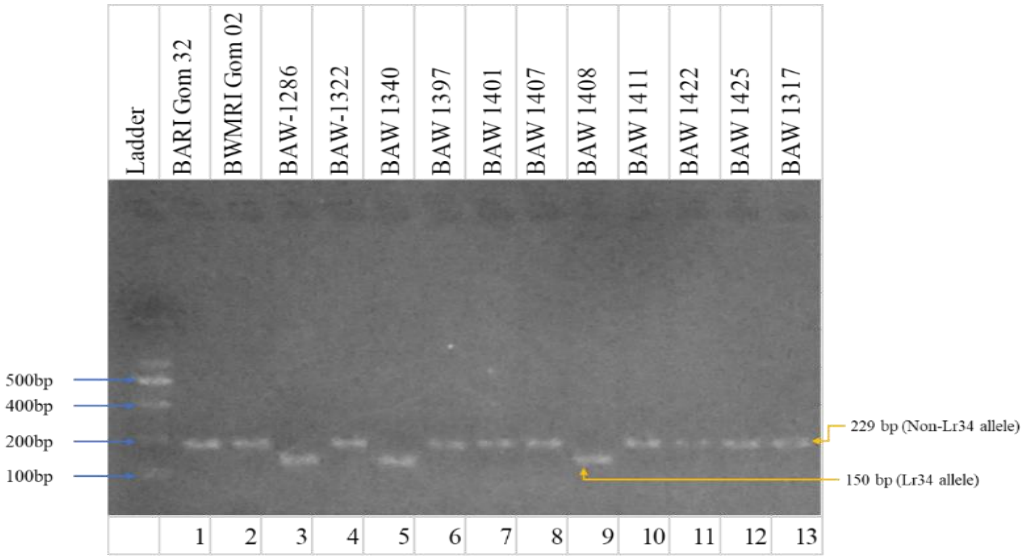


Figure 1: *PCR amplification of CVD, AYT and PYT genotypes with primer Lr 34 (1)*

shown positive band for 2NS segment, *i.e.* BAW 1317, BAW 1322, BAW 1397, BAW 1401, BAW 1407, BAW 1408, BAW 1411, BAW 1429, BAW 1432, BAW 1433, BAW 1434, BAW 1438, BAW 1439, BAW 1440, BAW 1474, BAW 1475, BAW 1476, BAW 1477, BAW 1478, BAW 1479, BAW 1480, BAW 1481, BAW 1482, BAW 1483. For Lr10 marker, five genotypes have shown positive band *i.e.* BAW 1317, BAW 1425, BAW 1471, BAW 1477, BAW 1480. For Lr24 marker, eleven genotypes have shown positive band *i.e.* BAW 1401, BAW 1474, BAW 1475, BAW 1476, BAW 1477, BAW 1478, BAW 1479, BAW 1480, BAW 1481, BAW 1482, BAW 1483. For Lr26 marker,

sixteen genotypes have shown positive band *i.e.* BAW 1286, BAW 1340, BAW 1408, BAW 1422, BAW 1429, BAW 1432, BAW 1433, BAW 1434, BAW 1435, BAW 1436, BAW 1438, BAW 1440, BAW 1484, BAW 1485, BAW 1461, BAW 1464. For Lr34 marker, all of the genotypes have shown positive band. For Lr34(1) marker, eighteen genotypes have shown positive band *i.e.* BAW 1286, BAW 1340, BAW 1408, BAW 1430, BAW 1434, BAW 1485, BAW 1457, BAW 1458, BAW 1459, BAW 1461, BAW 1462, BAW 1463, BAW 1464, BAW 1465, BAW 1466, BAW 1471, BAW 1472, BAW 1477. Harnessing source of wheat blast is continuing to the advanced lines in both national crosses and introduced wheat advanced lines from CIMMYT. Deployment of the newer sources of leaf rust were found in the latest genetic materials compared to the old parental stalk or varieties. Molecular screening for disease resistance will be continuing at the Molecular Breeding Laboratory to support the development of disease resistant wheat varieties in wheat breeding program of BWMRI.

1.3.2. CHARACTERIZATION OF BREAD WHEAT GENOTYPES USING SSR MARKERS FOR TERMINAL HEAT TOLERANCE

MF AMIN, MM RAHMAN, MM KHAN, MM HASAN, MS ISLAM AND G FARUQ

Abstract

Wheat is one of the most important crops in the world. Though, wheat yield has reduced due to heat stress affectation threat to sustainability and world food security in agricultural production. The first stage of heat tolerant breeding follows on the molecular and biochemical characterization and classification of wheat genotypes. The aim of the present study is characterization of widely grown bread wheat cultivars and breeding lines for heat tolerance so as to be adapted to different regions in Bangladesh. The genotypes were screened with molecular markers for the presence of QTLs mapped to different chromosomes. Results of the molecular studies identified and detected 13 polymorphic SSR markers which gave the clearest PCR bands among the genotypes. At the end of the research, bread wheat genotypes which were classified for tolerance or sensitivity to heat and the genetic similarity within varieties were determined by molecular markers. The molecular screening with SSR primers, genetic similarity coefficients were ranged from 0.00 to 0.925. The lowest genetic distance (0.000) was found in Nadi 2 vs BAW1147 variety pair indicating that they are genetically similar to each other. Comparatively higher genetic distance (0. 925) was observed between BAW 1290 vs BARI Gom 28. The dendrogram classified fifteen genotypes into two broad groups, A and B. The two groups were generated at a similar coefficient of 0.05. Group A consisted of seven genotypes and was further subdivided into two clusters. Group B consisted of eight genotypes which were further subdivided into two clusters. The mean HSI, TGW, grain yield and relative reduction in TGW & grain yield under stress condition over timely sown condition was the basis of categorization of genotypes parallel to the molecular data. Genotypes BARI Gom 25, BARI Gom 26, BARI Gom 27, BARI Gom 28, BARI Gom 29, BARI Gom 30, and BARI Gom 31 have proved their suitability for late sown condition out of fifteen genotypes. The genotypes as heat tolerance due to their SSR markers scores are expected to provide useful information for heat related molecular breeding studies.

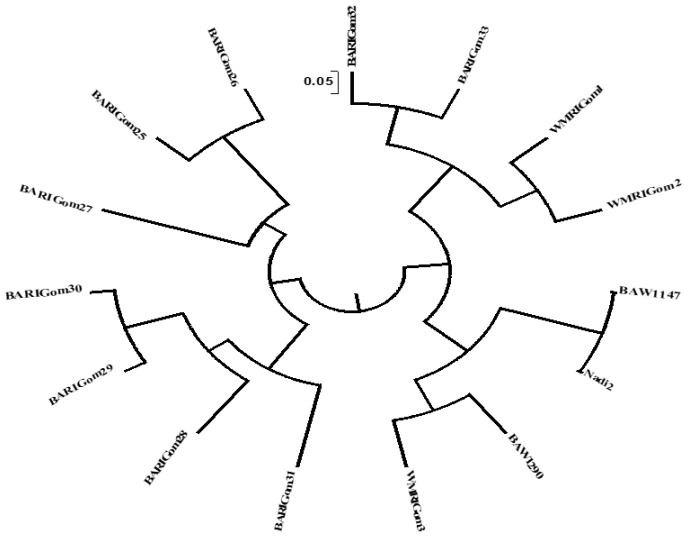


Figure 2: *Dendrogram generated through UPGMA analysis showing genetic relationship among the 15 wheat genotypes. Names of the genotypes are given on the ends of branches***.**

1.4. COLLABORATIVE STUDIES WITH INTERNATIONAL ORGANIZATIONS

1.4.1. ELITE SPRING WHEAT YIELD TRIAL (43thESWYT)

R ISLAM, MA HAKIM, MZ ISLAM, MSN MANDAL, MR KABIR, AA KHAN, MM HOSSAIN, M FARHAD AND HOSSAIN jr

Abstract

Fifty wheat genotypes selected for mega-environment one and received through CSISA project of CIMMYT, Mexico were evaluated at the Bangladesh Wheat and Maize Research Institute (BWMRI), Dinajpur in Alpha-lattice design. The genotypes were evaluated for yield, heading, maturity, plant height, number of grains per spike, 1000 grain weight, Bipolaris leaf blight, spike sterility tolerance, leaf rust resistance, physical grain characteristics etc. On the basis of overall performance five entries (E-102, E-103, E-128, E-146 and E-148) had selected for further evaluation in Bangladesh wheat screening nursery next year.

1.4.2. INTERNATIONAL BREAD WHEAT SCREENING NURSERY (55th IBWSN)

R ISLAM, MA HAKIM, MZ ISLAM, MSN MANDAL, MR KABIR, AA KHAN, MM HOSSAIN AND M FARHAD

Abstract

The International bread wheat screening nursery was conducted at BWMRI, Dinajpur, during rabi 2022-23 for evaluating field performance and yield potentiality of the genotypes adapted to Bangladesh condition. A total of 228 entries were sown in ITS condition and were laid out in augmented design with non-replication. Considering field performance, yield contributing characters, visual grain quality, plant height, tolerance to diseases, heading days etc. twenty-six genotypes e.g. E-1003, E-1004, E-1005, E-1019, E-1028, E-1042, E-1052, E-1057, E-1060, E-1070, E-1071, E-1097, E-1128, E-1137, E-1139, E-1140, E-1146, E-1155, E-1180, E-1182, E-1183, E-1184, E-1195, E-1210, E-1221 and E-1228 were selected for advance screening.

1.4.3. HIGH TEMPERATURE WHEAT YIELD TRIAL (21ST HTWYT)

MM HOSSAIN, MA HAKIM, MZ ISLAM, MSN MANDAL, MR KABIR, AA KHAN, M FARHAD, MM HOSSAIN jr., MM RAHMAN(Gazi), MM RAHMAN, MM HASSAN, MF AMIN, AND MN ALAM

Abstract

Fifty genotypes selected by CIMMYT, Mexico for high temperature, irrigated environments were evaluated in a trial at BWMRI Dinajpur, Gazipur and Rajshahi under late seeding condition. BWMRI recommended management was followed to raise the crop. The genotypes were evaluated for yield, heading, plant height, Bipolaris leaf blight and spike sterility tolerance, leaf rust resistance, physical grain characteristics etc. Considering overall performances, twenty genotypes selected were selected for further evaluation in heat tolerant wheat yield trial next year.

1.4.4. SEMI-ARID WHEAT YIELD TRIAL (30th SAWYT)

AA KHAN, MM RAHMAN, R ISLAM, MA HAKIM, MZ ISLAM, MSN MANDAL, MR KABIR, MM HOSSAIN, M FARHAD, AND MN ALAM

Abstract

A field experiment consisted of 50 advanced, high yield potential wheat lines provided by CIMMYT, Mexico included local check variety Shatabdi were evaluated at Dinajpur and RS, Rajshahi for the assessment of yield potentiality under non irrigated (drought stress) condition. The experiment was laid out in Alpha Lattice design with two replications. The genotypes were evaluated for yield, heading, maturity, height, sterility and lodging tolerance, disease resistance/tolerance, visual grain quality etc. Based on selection at field and visual grain quality after harvest along with considering desirable performance of yield and yield attributes, sixteen genotypes (E-305, E-307, E-308, E-315, E-319, E-320, E-321, E-328, E-336, E-338, E-339, E-340, E-341, E-345, E-346 and E-348) were selected among the tested genotypes.

1.4.5. SEMI-ARID WHEAT SCREENING NURSERY (40th SAWSN)

AA KHAN, MA HAKIM, MZ ISLAM, MR KABIR, MM HOSSAIN, M FARHAD AND MN ALAM

Abstract

Two hundred and twenty-eight elite genotypes received from CIMMYT, Mexico were evaluated along with the check variety Shatabdi in Regional Station, Bangladesh Wheat and Maize Research Institute, Shyampur, Rajshahi during Rabi 2022-23 cropping season under non irrigated timely sowing condition. The experiment aims to evaluate exotic drought adapted genotypes under Bangladesh condition. The genotypes were observed for yield potentiality, heading, diseases resistance/tolerance, sterility tolerance, visual grain quality, boldness of grains etc. under non irrigated field drought stress condition. On the basis of visual grain quality, yield and yield contributing traits nineteen genotypes e.g., E-05, E-10, E-11, E-14, E-16, E-20, E-21, E-36, E-39, E-52, E-95, E-124, E-134, E-145, E-159, E-184, E-185, E-205, E-215 were selected for further evaluation in the next year.

1.4.6. HIGH ZINC WHEAT YIELD TRIAL (2nd HZWYT)

M FARHAD, MSN MANDAL, MM HASSAN, MM RAHMAN(Gaz), MA HAKIM, MZ ISLAM, MR KABIR, AA KHAN, MM HOSSAIN, MM HOSSAIN Jr., MM RAHMAN, MN ALAM AND MF AMIN

Abstract

zForty-nine wheat genotypes enriched with zinc (Zn), selected from international nurseries, were evaluated in experimental fields at BWMRI Dinajpur, Gazipur, and Rajshahi during the rabi season of 2022-23. These genotypes were previously tested for elevated micronutrient concentration (Zn) at CIMMYT, Mexico, and were chosen for this study. The genotypes were cultivated under optimal conditions with full irrigation, following an alpha lattice design with two replications. Significant variations were observed among most of the studied traits. Of the tested genotypes, 30% outperformed the check variety Shatabdi (4450 kg/ha) in terms of yield. The genotypes displayed a wide range of grain yield, ranging from 3500 kg ha^{-1} to 4950 kg ha^{-1}. Notably, E-538 exhibited the highest yield (4950 kg ha^{-1}), followed by E-536 (4820 kg ha^{-1}) and E-530 (4730 kg ha^{-1}). Considering factors such as earliness, favorable agronomic traits, seed quality, yield potential, and Zn and Fe content, a selection of 18 genotypes, namely E-504, E-510, E-511, E-512, E-513, E-519, E-520, E-521, E-524, E-526, E-527, E-528, E-531, E-532, E-536, E-537, E-540, and E-541, have been chosen for further evaluation. Zn for the selected entries varies from 29-42 ppm whereas Fe content varies from 30 – 39.7 in the selected entries. These genotypes, enriched with micronutrients, will undergo further evaluation through yield trials conducted across various locations. The selected genotypes, with enhanced micronutrient content, hold promise for their potential promotion in future trials to assess their performance across different locations.

Picture 6: *Field view of 2nd HZWYT at BWMRI wheat breeding field*

1.4.7. HIGH ZINC ADVANCE NURSERY (14th HZAN)

M FARHAD, MA HAKIM, MZ ISLAM, MSN MANDAL, MR KABIR, AA KHAN, MM HOSSAIN AND MM HOSSAIN Jr.

Abstract

Two hundred thirty-two elite genotypes, received from CIMMYT, Mexico were evaluated in Bangladesh Wheat and Maize Research Institute, Dinajpur during Rabi 2022-23. The genotypes were evaluated for yield, heading days, plant height, sterility tolerance, visual grain quality, boldness of grains etc. On the basis of visual grain quality, yield contributing traits and others agronomical performances twenty two genotypes (., E-9, E-41, E-44, E-80, E-97, E-103, E-108, E-109, E-110, E-128, E-131, E-133, E-143, E-145, E-153, E-154, E-159, E-167, E-173, E-180, E-181, E-182, E-202, E-214, E-216, E-217 and E-220) were selected from this nursery for further evaluation in next year.

***Picture 7**: Field view of 14th HZAN at BWMRI wheat breeding field*

1.4.8. STRESS ADAPTIVE TRAIT YIELD NURSERY-HEAT (12th SATYN-HEAT)

MM HOSSAIN, MA HAKIM, MZ ISLAM, MSN MANDAL, MR KABIR, AA KHAN, M FARHAD, MM HOSSAIN Jr., MM RAHMAN(Gazi), MM HASSAN AND MF AMIN

Abstract

The nursery was consisted of 42 elite genotypes of wheat. It was grown under late sowing condition. Considering yield and other yield contributing characters along with different morphophysiological traits four genotypes viz. E-9003, E-9006, E-9014 and E-9028 were finally selected for further evaluation.

1.5. HYBRID WHEAT BREEDING

1.5.1 HYBRID WHEAT EVALUATION NURSERY, 2022-2023

M A HAKIM, A A KHAN, M MAHBUBUR RAHMAN, GOLAM FARUQ, REBECCA THISTLETHWAITE, RICHARD TRETHOWAN

Abstract

One hundred and one F1 exotic wheat hybrids developed by a novel and practical system (The BLA system) from The University of Sydney were tested locally with the objectives to release hybrid wheat variety in Bangladesh. The trials including BARI Gom 32, BARI Gom 33 and BWMRI Gom 2 as local checks were evaluated at Bangladesh Wheat and Maize Research Institute, Dinajpur and regional center Rajshahi under irrigated timely sown (ITS) conditions. Significant interaction observed over the locations and the genotypes were found influenced by high temperature at Rajshahi location. Results demonstrated that the genotypes took longer period at Dinajpur location than Rajshahi for both heading and maturity period. Results demonstrated that 14 hybrids at Dinajpur location gave 1%-19% increased yield over the best check BARI Gom 33. Similarly, at Rajshahi location, yield increase of 15 hybrids was recorded up to 22% over the best check BARI Gom 32. Considering both locations, eight hybrids viz. E 20, E 34, E 35, E 36, E 62, E 71, E 84, E 87 which were found 12-22% yield increased over the highest check might be selected for further observations and the parents of the selected hybrids need to be tested for seed production locally.

1.5.2 HYBRID WHEAT PRODUCTION THROUGH BLA TECHNOLOGY

M A HAKIM, A A KHAN, M MAHBUBUR RAHMAN, FARUQ GOLAM, REBECCA THISTLETHWAITE, RICHARD TRETHOWAN

Abstract

To produce elite wheat hybrids F1 locally, a novel and practical system (The BLA system) introduced at BWMRI in collaboration with The University of Sydney. Five BLA lines viz. BLA#2, BLA#3, BLA#4, BLA#6 and BLA#7 were used as a female parent for producing hybrid seeds whereas BARI Gom 30, BARI Gom 32, BARI Gom 33, BWMRI Gom 1, BWMRI Gom 2 and BWMRI Gom 3 were used as male parents. Therefore, 30 combinations were set to produce hybrid seeds adjusted to the local environment. The female line BLA 3 and BLA 4 seems to be a good combiner with our local wheat varieties adjusted to Bangladesh condition. The BLA 2, BLA 6 and BLA 7 lines might not fitted well because of their high difference in heading time and height compared with the male parents. Combinations will be enlarged in the next year and it will be adjusted to our recent experience.

1.5.3. WHEAT BLA LINE PRODUCTION

M A HAKIM, A A KHAN, M MAHBUBUR RAHMAN, FARUQ GOLAM, REBECCA THISTLETHWAITE, RICHARD TRETHOWAN

Abstract

The trial consisting of five BLA lines sent from The University of Sydney were grown and evaluated in this nursery at Bangladesh Wheat and Maize Research Institute, Dinajpur under irrigated timely sown (ITS) condition. Only mixture of blue and white seeds from a single wheat plant were kept and stored. A total of 11.8 kg seeds were preserved from the five BLA line. Blue and white seeds will be separated from the mixture and blue seeds will be used next year as a maintainer of the respective BLA line. However, sterile white seeds will be used as a female parent in hybrid production.

Picture 8: *Hybrid wheat production through BLA Technology at BWMRI wheat breeding research field*

1.6 VARIETY MAINTENANCE AND BREEDER SEED PRODUCTION OF WHEAT

1.6.1 MAINTENANCE OF FIRST- AND SECOND-YEAR LINES OF RECOMMENDED WHEATVARIETIES

MZ ISLAM, MA HAKIM, MR KABIR, MM HOSSAIN, M. FARHAD, AA KHAN, MM HOSSAIN, MM HOSSAIN Jr AND MG FARUQ

Abstract

In 2022-23, eight bread wheat varieties namely BARI Gom 25, BARI Gom 30, BARI Gom 32, BARI Gom 33, BWMRI Gom 1, BWMRI Gom 2, BWMRI Gom 3, and BWMRI Gom 4 were maintained in first year line and except BARI Gom 25, the rest seven varieties were maintained in second year line at BWMRI, Nashipur, Dinajpur. In the first-year lines, 50 out of 200 rows were selected, harvested and threshed separately to form the source seed of the second year lines for next season. From the second-year lines, a total quantity of 4224 kg of seed from the selected plots of seven varieties was produced, and these will be sown next season for breeder seed production. On the other hand, 1005 kg of seed was produced from the remaining plots other than the selected ones as grade II seeds, which can be used for TLS production next year.

Picture 9: *Maintenance breeding plots of different wheat varieties at BWMRI, Dinajpur*

1.6.2 BREEDER SEED PRODUCTION OF RECOMMENDED WHEAT VARIETIES

MZ ISLAM, MA HAKIM, MR KABIR, MM HOSSAIN, M. FARHAD, AA KHAN, MM HOSSAIN, MM HOSSAIN Jr, MSN MANDAL, MN ALAM, AND MG FARUQ

Abstract

Breeder seeds of BARI Gom 30, BARI Gom 32, BARI Gom 33, BWMRI Gom 1, BWMRI Gom 2, and BWMRI Gom 3 were produced in large plots at different station of BWMRI under the supervision of wheat breeders during Rabi 2022-23. A total of 56809 kg of breeder seed was produced under different stations of BWMRI in the rabi season 2022–23, among which 18541 kg were produced at the BWMRI headquarter, Nashipur, Dinajpur; 31168 kg were produced at the seed production station, Debiganj, Panchagarh; and 7100 kg were produced at the seed production sub-station, Thakurgaon. Besides this, a total of 53207 kg of TLS of different varieties was produced under different stations of BWMRI in the rabi season 2022–23.

PROJECT 2: MAIZE BREEDING PROGRAM

Maize (*Zea mays* L.) is the second most important cereal crop in Bangladesh after rice in terms of area and production and 1st in case of production per unit area (10.62 t/ha). Although, the crop can be grown in both *kharif* and *Rabi* seasons, but the potentiality of realizing higher yield is possible only during the *Rabi* season. Most of the maize fields are irrigated, and farmers cultivate hybrid maize with improved production technology, which is the secret behind higher production in Bangladesh. The area under maize has been expanding since the early 2000s, driven by demand from the poultry feed industry and almost 100% maize areas are covered by hybrids. Maize area planted in Bangladesh has risen from just a few thousand hectares in 1993-94 to a total of 6.05 lac hectare in the 2022-23 and approximately 64.31 lac tons of maize grain were produced, whereas annual grain requirement is about 70 lakh tons. Maize research in Bangladesh was initiated on a modest scale in the early fifties with the introduction of some composite popcorn and sweet corn varieties with a view to popularize maize in this region. Initial thrust was given for the development of OPVs as it has an advantage over hybrid in greater convenience of seed multiplication. During the period between 1986 and 2013, 9 composites including field corn, popcorn, sweet corn and baby corn have developed and released of which some have got popularity among the farmers. Since early nineties, the research strategy was directed from composite and synthetic towards the development of hybrids. Programs have also been taken up for the development of inbred lines from locally using hybrids and OPVs. Promising commercially cultivated single crosses are being recycled for extraction of superior inbred lines. In the meantime, both exotic and locally developed lines used for development of single cross and a good success have been achieved. Besides inbred line development, maize improvement program of BWMRI has also been testing exotic hybrids received from CIMMYT through project based (HTMA project) international trials in collaboration with private partners (BRAC, ACI Ltd. and Lal Teer Seed Ltd.) with a view to identify better performing hybrids, targeted for stress prone areas (heat). Using introduced and locally developed inbred lines, maize breeding program has so far developed and released 20 hybrids from 2000 to 2023 of various kinds. Now the major objectives of this division is to develop high yielding hybrids of field corn and specialty corn i.e. popcorn, baby corn and sweet corn. Emphasis has also been given for the development of short stature & lodging tolerant hybrids. Breeding for stress tolerance (heat, salt and drought), development of location specific varieties (haor, char, hilly areas) and molecular approach to identify stress tolerant genes has also got due importance. Public & private partnership (PPP) has also strengthened for seed production of the released hybrid and large-scale scale-out among maize farmers.

Picture 10: *Maize Breeder is making crosses with his technical team at BWMRI Dinajpur*

2.1 GERMPLASM COLLECTION, CHARACTERIZATION AND MAINTENANCE

2.1.1 MAINTENANCE AND CHARACTERIZATION OF LOCALLY DEVELOPED INBRED LINES OF MAIZE (10 Sets)

M.F. AMIN, M.M. HOQUE, J.B. AZIM, S. SULTANA AND S. AHMED

Abstract

Inbred lines are the prerequisite for hybrid development. Characterization of inbred gives us opportunity to identify a particular variety and maintain seed purity by rouging off type plant. This experiment was conducted at Dinajpur, Jashore, and Gazipur during Rabi season of 2022-23 with 184 inbred lines consisted of ten sets. Each inbred line was selfed by hand pollination and seeds were preserved separately for future breeding program.

2.1.2 MAINTENANCE OF EXOTIC INBRED LINES OF MAIZE (2 SETS)

J.B. AZIM, M.M. HOQUE AND S. AHMED

Abstract

Inbred lines are the prerequisite for hybrid development. Characterization of inbred gives us opportunity to identify a particular variety and maintain seed purity by rouging off type plant. This experiment was conducted at Dinajpur during Rabi 2022-23 with fifteen exotic Pro Vitamin-A enriched field corn inbred lines and seven exotic FAW resistant inbred lines. Each inbred line was selfed by hand pollination and a total of 15.03 kg seeds were preserved separately for future breeding program.

2.2 DEVELOPMENT OF SOURCE POPULATION AND INBRED LINES

2.2.1 ADVANCING S_5 TO S_6 GENERATION OF FIELD CORN (1 SET)

M.F. AMIN AND S. AHMED

Abstract

One set of S_5 lines extracted from IM-8013 variety were advanced to S_6 generation to develop superior inbred lines. The balanced bulk seeds of S_5 lines of IM-8013 (20 lines) were advanced from S_5 to S_6 generation. The previously selected S_5 plants in each line of each set were selfed by hand pollination. Variations were found among the S_5 lines for different traits. Finally, 5.61kg selfed seeds were harvested from IM-8013 and kept them separately for advancing the population to S_7 generation.

2.3 EVALUATION OF INBRED LINES

2.3.1 STUDY ON COMBINING ABILITY AND HETEROSIS IN MAIZE OVER LOCATIONS

M.M. HOQUE, J.B. AZIM, M.F. AMIN, A.A. KHAN, AND S. AHMED

Abstract

Heterosis and combining ability were studied for days to 50% tasseling, days to 50% silking, plant height, ear height, days to maturity and kernel yield in a diallel cross involving eight elite maize inbred lines excluding reciprocals over three environments. The mean sum of square obtained from combined analysis of variance showed the presence of genetic variability among the crosses, environment and crosses × environment interaction for all of the studied characters except plant height for environment. The variances for general combining ability (GCA) and specific combining ability (SCA) of variance were found significant for all the characters indicating both additive and non-additive type of gene action were important for controlling the traits. Variances due to GCA were much higher in magnitude than SCA for all the characters except plant height and yield indicating prevalence of additive gene effects for the inheritance of these traits. Parents with good positive GCA for yield were found in P3 (Pina10), P7 (BIL28) and P8 (BIL157); good negative GCA for early maturity, plant and ear height in P5 (BMZ9) may be extensively used in hybridization program as a donor. Standard heterosis estimation was carried out using commercial variety 9120. All hybrids

show numerically lower yield than Palowan 9120 and BWMRI HM 2 except Pina10xBIL28. The better performing two crosses $P_3 \times P_7$ (Pina10xBIL28) and $P_6 \times P_7$ (BIL28xBIL157) can be utilized for exploiting hybrid vigor as well as for developing high yielding hybrid varieties. These crosses also need to be evaluated further in wider agro-climatic conditions.

2.4 EVALUATION OF SINGLE CROSS HYBRIDS

2.4.1 DEMONSTRATION TRIAL OF RELEASED AND PROMISING HYBRIDS WITH COMMERCIAL HYBRIDS OVER LOCATIONS

M.M. HOQUE, J.B. AZIM, M.F. AMIN, A.A. KHAN, S. SULTANA, M.A. MIAH, AND S. AHMED

Abstract

Sixteen maize (*Zea mays* L.) hybrids (released and promising) along with four commercial check varieties were evaluated for kernel yield and yield contributing traits over four locations (Dinajpur, Gazipur, Jamalpur and Jashore) during Rabi season of 2022-23. The mean performance of yield and its contributing traits of the genotypes over four locations were analyzed to identify the best hybrid(s). The hybrid BWMRI HM-2 produced maximum kernel yield in Dinajpur (16.25 t/ha) as well as in Jamalpur (14.55 t/ha). In Gazipur, check varieties P-3355 and 9217 produced the highest yield (12.88 t/ha and 12.64 t/ha respectively). In Jashore, the single cross hybrid BAM 13 x BIL 28 was found as the highest yielding variety (15.57 t/ha) along with BAM 5 x BIL 28 (14.82 t/ha) and BWMRI HM-2 (14.52 t/ha). Whenever, BHM-14 produced the lowest yield across the four locations.

2.4.2 EVALUATION OF SINGLE CROSS HYBRIDS OF FIELD CORN (3 SETS)

M.M. HOQUE, J.B. AZIM, A.A. KHAN, S. SULTANA, M.A. MIAH, AND S. AHMED

Abstract

Total seventy-three locally developed single cross hybrids have been evaluated over three locations separately along with four local check varieties during Rabi 2022-23. Considering the yield and yield contributing traits, 9120-6 x BIL-28 (16.3 t/ha) and Ag-113 x BIL- 28 (15.73 t/ha) exhibited the higher grain yield similarly or nearly the yield performance of check varieties in Jashore. The promising hybrid BAM 5 x BIL 28 (14.29 t/ha) produced the highest yield over the check varieties in Jamalpur. Same result was found in Dinajpur where BWMRI HM-2 and DKC-9217 was the highest yield producing varieties with an average yield of 15.42 t/ha and 14.99 t/ha respectively. Moreover, single cross hybrids Titan 10 x BIL 28 (14.89 t/ha) and Titan 16 x BIL 28 (14.88 t/ha) were found promising among the hybrids under study.

2.4.3 EVALUATION OF SINGLE CROSS HYBRIDS OF FIELD CORN AT DIFFERENT LOCATIONS (SET-I)

M.M. HOQUE, J.B. AZIM, M.F. AMIN, A.A. KHAN, AND S. AHMED

Abstract

Forty-six promising hybrids and four checks viz. BWMRI HM 2, 9217, P3355 and NH7720 were evaluated at three locations viz. Dinajpur, Gazipur and Jamalpur following alpha lattice design with 2 replications during rabi 2022-23 to select best stable hybrids. The genotype-environment interactions over three locations to select the hybrid having higher yield and other potential attributes was analyzed according to Eberhart and Russel (1966). Significant variation for genotypes (G), environment (E) and GEI were observed for the studied character. The environment Gazipur and Jamalpur were poor; but Dinajpur was rich for hybrid maize production. Considering the mean, bi and S^2di for all the hybrids showed different response of adaptability under different environmental conditions. Among the hybrids Entry 21(Titan 6x BIL28) produced the highest yield (15.74 t/ha) followed by E47(15.57 t/ha), E48 (14.59 t/ha), E25 (14.42 t/ha), E27 (14.20t/ha), E42 (13.52t/ha), E18 (13.37t/ha), E29(13.32t/ha) and E4(13.01t/ha). Among the selected hybrids E4, E18, E21 and E27 were stable across environment but rest were responsive to specific environment.

2.4.4 EVALUATION OF SELECTED SINGLE CROSS HYBRIDS OF FIELD CORN OVER LOCATIONS (SET II)

M.M. HOQUE, J.B. AZIM, M.F. AMIN, A.A. KHAN, S. SULTANA, M.A. MIAH, AND S. AHMED

Abstract

Thirty-six locally developed hybrids have been evaluated over three locations namely Dinajpur, Gazipur and Jashore with four check varieties during Rabi 2022-23. There were significant variations among genotypes, which also responded variously according to environments. Among the locally developed hybrids namely Titan-34 x BIL 28 (13.80 t/ha) showed higher yield than all check varieties except local check BWMRI HM 2. Hybrids BIL28× BIL95 (12.62 t/ha), BIL28 x BIL157 (12.32 t/ha), Titan-39 x BIL 28 (12.28 t/ha), Titan-29 x BIL 28 (12.17 t/ha) and CML431×BIL28 (12.14 t/ha) produced lower yield than all the check varieties but were moderate yielder and were stable across the environments.

2.4.5 COMPARATIVE YIELD TRIAL OF IMPORTED AND LOCAL MAIZE HYBRIDS

M.M. HOQUE, J.B. AZIM, M.F. AMIN, A.A. KHAN, S. SULTANA, M.A. MIAH, AND S. AHMED

Abstract

The present study assessed genotype × environment interaction for grain yield, days to pollen shedding, days to silking, plant height and ear height and stability for grain yield with twenty-four hybrids across four different locations of Bangladesh during Rabi 2022-23. The AMMI model (additive main effects and multiplicative interaction) was used to analyze the genotype-environment interactions over four locations to select the hybrid having higher yield and other potential attributes. Highly significant variation for genotypes (G), environment (E) and GEI were observed for the character yield. Considering the yield potentiality and stability parameter, genotypes DEKALB 8225 (12.71 t/ha), Ruposhi Bangla (12.77 t/ha), Bahadur (12.93 t/ha), Don 111(12.95 t/ha), Himaloy (13.38 t/ha), Pioneer-3355 (13.55 t/ha) and DKC 9217(14.26 t/ha) were stable across environment with high yield. BWMRI HM 2 (14.71 t/ha) was also high yielder but responsive to specific environment.

2.5 STRESS BREEDING- ABIOTIC STRESS TOLERANT VARIETY DEVELOPMENT

2.5.1 PHENOTYPING OF THE HTMA HYBRIDS DURING KHARIF SEASON (11 SETS)

A. AHMED, M.M. HOQUE, J.B. AZIM, M.F. AMIN, S. SULTANA, M.A. MIAH, AND S. AHMED

Abstract

Eight hundred and eighty two maize hybrids of different stages (stage I-IV) received from CIMMYT, India under HTMA project and comprised of eleven trials (HY2204-1, HY2203-1, HY2202-1, HY2201-5, HY2201-4, HY2201-3, HY2201-2, HY2201-1, ROFT21-3, ROFT21-4 and ROFT21-5) were evaluated at three different stations of BWMRI (Dinajpur, Gazipur and Jashore) and three partner seed companies collaborating with HTMA project (BRAC, ACI seeds and Lal Teer Seed Ltd.) during kharif season of 2022. Five characters namely anthesis days, anthesis silking interval (ASI), plant height, ear height and yield were closely observed and different characters showed variations among entries in different trials. Entries evaluated at Dinajpur, generally produced highest average yield i.e., its environment was more favourable for hybrid maize production. From the eleven trials several crosses were selected for further evaluation which are: 5 entries (VH182959, VH183068, ZH20370, VH182964 and ZH20373) from HY2204-1; 3 entries (ZH22702, ZH22707 and ZH22692) from HY2203-1; 3 entries (ZH22744, ZH22771, ZH22764) from HY2202-1; 5 entries (ZH22606, ZH22596, ZH22666, ZH22625 and ZH22631) from HY2201-5; 9 entries (ZH22391, ZH22399, ZH22480, ZH22386, ZH22443, ZH22401, ZH22452, ZH22498 and ZH22410) from HY2201-4; 10 entries (ZH22187, ZH22254, ZH22332, ZH22317, ZH22304, ZH22346, ZH22270, ZH22314, ZH22329 and ZH22341) from HY2201-3; 3 entries (ZH22118, ZH22126 and ZH22155) from HY2201-2; 5 entries (ZH223, ZH2210, ZH2213, ZH2275 and ZH2276) from HY2201-1; 3 entries (ZH17362, ZH17375 and KH152096) from ROFT21-3; 1 entry (VH153492) from ROFT21-4 and 2 entries (ZH159 and VH18568) from ROFT21-5.

2.6 PRODUCTION OF NEW HYBRIDS

2.6.1 SEED PRODUCTION OF PROMISING HYBRIDS OF FIELD CORN IN ISOLATION

J.B. AZIM, M.M. HOQUE AND S. AHMED

Abstract

28 inbred lines of field corn were grown at BWMRI, Dinajpur during Rabi 2022-23 to produce 25 promising field corn hybrids. Total 250 kg seeds of 25 promising field corn hybrids were obtained and stored for further evaluation in the next Rabi season.

2.7 MAINTENANCE AND SEED INCREASE OF PARENTAL/ INBRED LINES

2.7.1 SEED PRODUCTION OF THE PARENTAL LINES OF DIFFERENT RELEASED MAIZE HYBRIDS

J.B. AZIM, M. HOQUE, A.A. KHAN, S. SULTANA, AND S. AHMED

Abstract

Eight parental lines of selected promising hybrids were grown during Rabi 2022-23. Total 1730 seeds were obtained from eight parental inbred lines and stored for maintenance of those inbred lines in the next Rabi season.

2.8 SEED PRODUCTION OF DIFFERENT RELEASED HYBRIDS

2.8.1 SEED PRODUCTION OF BWMRI/BARI HYBRID MAIZE

J.B. AZIM, M.Z. ISLAM, S. HOSSAIN, M.M. HOQUE, AND S. AHMED

Abstract

Seeds of six BWMRI and BARI released hybrids were produced in isolation at four different BWMRI research stations during Rabi 2022-23. Total 3000 kg hybrid seeds (F_1) were obtained and stored for distribution and experimental use in the next Rabi and kharif season.

Picture 11: *Seed Production of BWMRI Hybrid Maize 2*

2.9 MAINTENANCE AND SEED PRODUCTION OF OPEN-POLLINATED VARIETIES

2.9.1 MAINTENANCE AND SEED PRODUCTION OF COMPOSITE MAIZE VARIETIES

A. A. KHAN, M.Z. ISLAM, S. HOSSAIN AND S. AHMED

Abstract

Three composite maize varieties were grown in isolation at two different locations of BWMRI research stations during Rabi 2022-23 and a total amount of 900 kg seeds were obtained and stored for maintenance distribution in the next Rabi season.

2.10 COLLABORATIVE PROGRAMS/ TECHNOLOGY TRANSFER ACTIVITIES

2.10.1 BANGLADESH COORDINATED MAIZE (BCM) TRIAL DURING KHARIF SEASON

J.B. AZIM, M.M. HOQUE, A. AHMED, M.F. AMIN, A. ISLAM, M.R. ALI AND S. AHMED

Abstract

An experiment was carried out with twenty genotypes received from two partners (BWMRI, and BRAC) under Bangladesh Coordinated Maize (BCM). Trials were executed with three internal checks (BM-K006, Pillar and BHM17) and two commercial check varieties (Don111 & Pacific-164) at four different locations of four districts during Kharif-2022. The present study assessed genotype × environment interaction for grain yield, days to pollen shedding, days to silking, plant height, ear height and stability for grain yield across locations of Bangladesh. Significant variation for genotypes (G) and environment (E) were observed for different characters including yield. The environment of Dinajpur and Gazipur were unfavorable whereas the environment of Bogura and Kushtia were favorable for hybrid maize production. The environment of Bogura was highly favorable followed by Kushtia for hybrid maize cultivation. Considering the yield potentiality and stability parameter and AMMI biplot, it is clear that it is clear that the genotypes BM-K002 (9.03 t/ha), BM-K005 (10.08 t/ha), BAM-06×BIL-28 (9.58 t/ha), BM-K003 (10.04 t/ha) and BML-249xBIL-157 (8.79 t/ha) showed more than the average yield which were found stable in all environmental conditions. Among them genotype BAM-10×BIL-28 (9.58 t/ha), BAM-14×BIL-28 (10.14 t/ha) and BM-K001 (10.3 t/ha) showed higher yield but responsive to specific environment.

2.10.2 BANGLADESH COORDINATED MAIZE (BCM) TRIAL DURING RABI SEASON

J.B. AZIM, M.M. HOQUE, M.F. AMIN, A. ISLAM, M.R. ALI AND S. AHMED

Abstract

An experiment was carried out with twenty genotypes received from two partners (BWMRI, and BRAC) under Bangladesh Coordinated Maize (BCM). Trials were executed with three internal checks (BM-R006, Pillar & BWMRI HM 2) and two commercial check varieties (NH7720 & P-3355) at four different locations of four districts during Rabi 2022-23. The environment of Dinajpur and Gazipur were unfavorable whereas rest of the environments or management were favorable for hybrid maize production. The environment of Nilphamari was highly favorable followed by Kushtia for hybrid maize cultivation. Considering the yield potentiality and stability parameter and AMMI biplot, it is clear that six genotypes BM-R002 (13.44 t/ha), BM-R003 (13.85 t/ha), BM-R005 (13.4 t/ha), BAM-06×BIL-28 (14.21 t/ha), BAM-10×BIL-28 (14.7 t/ha) and BAM-14×BIL-28 (13.98 t/ha) were stable across environment with high yield

2.10.3 EVALUATION OF SELECTED HTMA HYBRIDS

J.B. AZIM, M.M. HOQUE, M.F. AMIN, A. ISLAM, M.R. ALI AND S. AHMED

Abstract

Twenty-five genotypes received under Heat Tolerant Maize for Asia (HTMA) Project from CIMMYT, India were evaluated with four check varieties (BWMRI HM 2, DKC-9217, NH-7720 & Pioner-3355) in four different regions namely Dinajpur, Gazipur, Nilphamari and Kushtia during Rabi 2022-23. The present study assessed genotype × environment interaction for grain yield, days to pollen shedding, days to silking, plant height, ear height and stability for grain yield across locations of Bangladesh. The environment of Gazipur was unfavorable, but Kushtia was favorable for hybrid maize production. Considering the yield potentiality and stability parameter and AMMI biplot, it is clear four genotypes (7) ZH181056 (12.52 t/ha), (13) ZH182014 (12.8 t/ha), (16) ZH181938 (12.92 t/ha), (12) ZH17445 (13.36 t/ha) and check BWMRI HM 2 (15.99 t/ha) were stable across environment with high yield. On the other hand, genotypes (14) ZH182015 (13.26 t/ha) and (11) ZH182013 (12.8 t/ha) and P-3355 (14.24 t/ha) were high yielder and responsive to the specific environment.

2.10.4 SEED PRODUCTION RESEARCH (SPR) FOR PARENTS OF ELITE MAIZE HYBRIDS

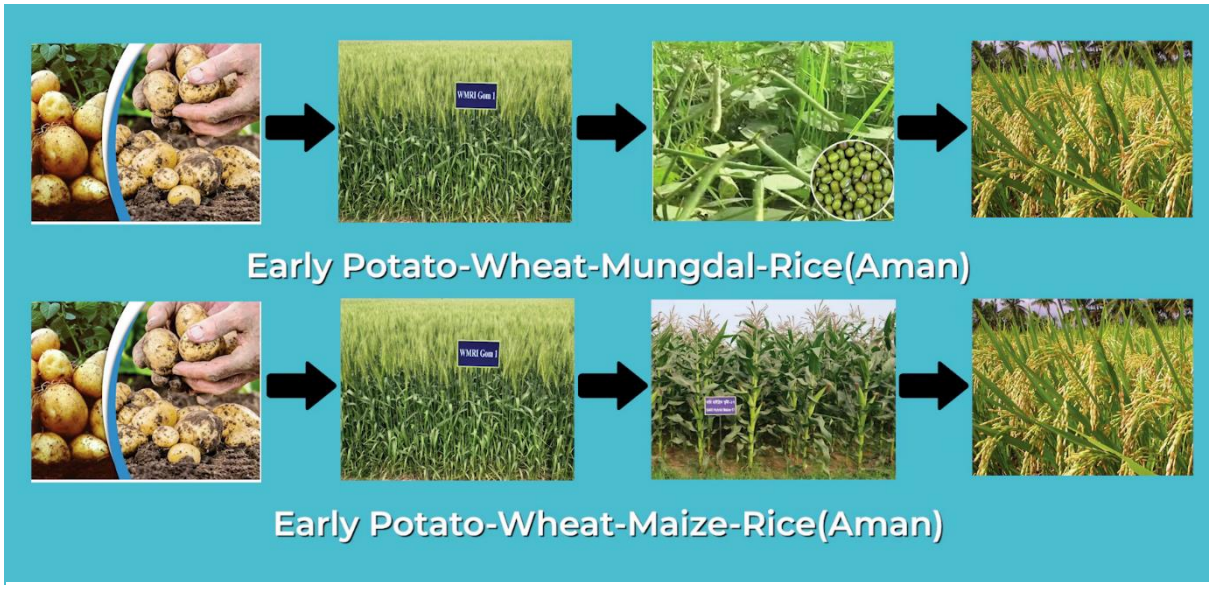
J.B. AZIM, M.M. HOQUE, A. ISLAM, M.R. ALI AND S. AHMED

Abstract

Sixty-two inbred lines received from CIMMYT, India under SPR project were grown at two different locations of BWMRI and BRAC research stations during Rabi 2022-23 to evaluate the performance of seed and pollen parents for generating seed production data at seed production hubs. 25 inbred lines were selected as female parent and 10 inbred lines were selected as male parent. These selected parents will be used in future breeding program.

PROJECT 3: CROP AND SOIL MANAGEMENT

The Crop and Soil Management Group at the Bangladesh Wheat and Maize Research Institute (BWMRI) is at the forefront of research aimed at enhancing agricultural practices and improving crop yields while maintaining soil health. Comprising two divisions, namely the Division of Agronomy and the Division of Soil Science, the group undertakes a diverse array of research projects that address key challenges in sustainable crop production and soil fertility. These projects encompass a wide spectrum of topics, ranging from optimizing sowing times for newly developed wheat and maize varieties to exploring innovative techniques like intercropping for pest control. By conducting in-depth investigations into factors such as nutrient management, planting methods, and varietal responses, the group contributes significantly to the advancement of practical and science-based solutions for improving agricultural outcomes in Bangladesh and beyond.



Picture 12: BWMRI developed more profitable four crops cropping pattern

3.1 CROP MANAGEMENT

3.1.1 LONG-TERM BED PLANTING TRIAL FOR IMPROVING CROPS PRODUCTIVITY AND SOIL FERTILITY IN WHEAT-MUNGBEAN-RICE CROPPING PATTERN

ILIAS HOSSAIN, GOLAM FARUQ, AKBAR HOSSAIN, T. KRUPNIK AND M. K. GATHALA

Abstract

A nineteen years long term bed planting field experiment was conducted to study the productivity, soil fertility and N-use efficiency of intensified RW systems by adding a third pre-rice crop of mungbean. System productivity, fertility and N use efficiency were evaluated under five N fertilizer levels (0, 40, 80, 100 and 120 % N of recommended dose, two straw retention (SR) (0 and 30%) and two tillage options (raised bed and conventional tillage practice (CTP). Permanent beds with 30% straw retention produced the highest productivity for all three crops in the sequence. Within each N rate the total system (rice-wheat-mungbean) productivity was higher with 30% SR on PRB and least in CTP with 0% SR. At 80% of recommended fertilizer N rate, mean annual system productivity was 12.5 t/ha for PRB with 30% SR, 11.2 t/ha with PRB on 0% SR and 10.3 t/ha with CTP without straw. N uptake and use efficiency were increased with increasing N levels with bed planting up to 120% N application (120 kg N ha^{-1}) in wheat, both 100% (80 kg N ha^{-1}) in rice and (20 kg N ha^{-1}) in mungbean for all years. System productivity in N unfertilized plots increased when straw was retained due to increased supply and uptake of N. Reduced rat damage 81.3% by PRB systems over farmer's practices. The results suggest that N fertilizer rates can be reduced when 30% straw is retained both from rice and wheat & full residue retention from mungbean. Soil organic matter in surface soil layers

of the PRB had increased by 0.82% after thirteen years (19 rice-wheat-mungbean crop cycles) with 30% SR. Straw retention is an important component of soil management and may have long term positive impacts on soil quality compared with conventional tillage with 0% SR. The combination of

Picture 13: *Insights from a Long-Term Bed Planting Trial in Wheat-Mungbean-Rice Cropping Pattern, a Promising Experiment at BWMRI*

PRB with residues retained appears to be a very promising technology for sustainable intensification of RW systems in Bangladesh.

3.1.2 RESPONSE OF NEWLEVOLVEED WHEAT, MAIZE AND RICE VARIETIES UNDER CONSERVATION AGRICULTURE SYSTEMS

ILIAS HOSSAIN, GOLAM FARUQ, AKBAR HOSSAIN, TIM KRUPNIK AND M. GATHALA

Abstract

A two years experiment was conducted at Regional Station, BWMRI, Rajshahi to selection of suitable varieties in wheat–maize-rice cropping system under Conservation Agriculture systems and establish of wheat-maize-rice cropping pattern under CA systems in Rajshahi areas. The trial comprises of five tillage options (zero tillage, strip tillage, permanent raised bed, minimum tillage and conventional tillage practice (CTP) and three varieties in wheat-maize-rice cropping pattern under keeping 30% crop residue retention in strip plot design with three replications. The varieties were evaluated for yield and yield components with some phenological and physiological parameters in all crops sequence. From the study it revealed that both raised bed and strip tillage systems with varieties affected in terms of phonological and physiological parameters with yield and yield components which ultimately produced maximum yield due to its more Picturesynthesis, chlorophyll content with optimum canopy temperature and border effect. The results indicated that keeping standing 30% crop residue in the field with minimum disturbance of soil had significant contribution on phonological and grain yield of wheat-maize-rice sequence compare to conventional tillage practice. Rice equivalent yield was higher under raised bed and strip till systems with wheat variety BWMRI Gom 2, maize

Picture 14: *A Comprehensive Study on the Response of Newly Evolved Wheat, Maize, and Rice Varieties under Conservation Agriculture Systems, Highlighting Sustainable Practices and Crop Performance at BWMRI.*

variety BARI Hybrid maize 17 and rice variety BRRI dhan 87. Considering the overall growth, yield and other characters of three varieties under different tillage options BWMRI Gom 2, BARI Hybrid maize 17 and BRRI dhan 87 have been provisionally selected under raised bed and strip till method at Rajshahi region as well as in Wheat-Maize-Taman rice growing areas in Bangladesh.

3.1.3 THE EFFECT OF VARIETY AND TIME OF DE-TOPPING ON GRAIN AND FORAGE YIELD OF MAIZE

M.M. BAZZAZ, A. HOSSAIN, M.M. AKHTAR, M.N. ALAM AND M.A.Z. SARKER

Abstract

The experiment was conducted at the research field of Bangladesh Wheat and Maize Research Institute, Dinajpur during rabi season of 2022-2023 to examine the time of de-topping effects on grain and forage yield of maize varieties. The unit plot size was 3m×4m. Seeds were sown on 24 November 2022 with a spacing of 60 cm apart from rows and 20 cm from seed to seed. The variety was BARI Hybrid Maize 9 and BARI Hybrid Maize 16. Four de-topping treatments were employed in this study viz. (T_1) = Control (no de-topping) (T_2) = De-topping at 10 days after silking (T_3) = De-topping at 20 days after silking, (T_4) = De-topping at 30 days after silking. From 1st year result, it was found that early de-topping (10 DAS) gave higher green forage yields but grain yield decreased drastically. On the other hand, de-topping at later stages (30 DAS) recorded higher grain yield. The highest gross return (188116.67 tk./ha) and gross margin (128116.67 tk./ha) were obtained in variety BARI Hybrid Maize 16 followed by the variety BARI Hybrid Maize 9 where de-topping was done at 30 days after silking.

Picture 15: *Investigating the impact of maize variety and de-topping timing on grain and forage production*

3.1.4 DEVELOPMENT OF FERTILIZER RECOMMENDATION FOR HYBRID MAIZE IN KHARIF SEASON

MM AKHTER, MM BAZZAZ, A. HOSSAIN AND MAZ SARKER

Abstract

To find out the optimum fertilizer doses of hybrid maize cultivation in Kahrif season, a field experiment was conducted at the Research Field of Bangladesh Wheat and Maize Research Institute, Nashipur, Dinajpur during Kharif season from April to August, 2020-21 and 2021-22. The experiment was comprised with six treatments *viz.* T_1 = Soil test based (STB) chemical fertilizer dose for Rabi, T_2 = 85% of T_1 + 5 t ha^{-1} cow dung, T_3 = 70% of T_1 + cow dung 5 t ha^{-1}, T_4 = Integrated plant nutrient system (IPNS) of T_2 with 5 t ha^{-1}cow dung, T_5 = IPNS of T_3 with 5 t ha^{-1} cow dung and T_6 = IPNS of T_1 with 5 t ha^{-1} cow dung. The mean results revealed that STB chemical fertilizer dose for Rabi *i.e.*, treatment T_1 produced the highest grain yield followed by the treatments T_6 and T_2 and the lowest grain yield was recorded in the treatment T_5 *i.e.*, IPNS of T_3 with cow dung 5

Picture 16: *Experiment of fertilizer recommendation development for hybrid maize cultivation during kharif season*

t ha^{-1} in both the year. The highest gross return (212132.30 Tk ha^{-1}) and gross margin (133607.30 Tk ha^{-1}) were also obtained in $T_{1,}$ where STB chemical fertilizer dose for Rabi was used followed by the treatment T_6 and T_2, while the lowest gross return (167578.71 Tk ha^{-1}) and gross margin (82781.71 Tk ha^{-1}) were obtained in T_5, i.e., IPNS of T_3 with cow dung 5 t ha^{-1} followed by the treatment T_4 *i.e.*, IPNS of T_2 with cow dung 5 t ha^{-1}.

3.1.5 RESPONSE OF MAIZE-LEGUME INTERCROPPING AS PUSH-PULL TECHNIQUE TO CONTROL FALL ARMYWORM

MM AKHTER, MMR SHAH, S ISLAM, MN ALAM, MM BAZZAZ, A. HOSSAIN AND MAZ SARKER

Abstract

A filed experiment was conducted at the Research Field of Bangladesh Wheat and Maize Research Institute, Nashipur, Dinajpur during April to August 2022 to control the infestation of Fall Armyworm (FAW) in maize through maize-legume intercropping as push-pull techniques. The study was consisted five treatments viz. T_1 = Sole Maize, T_2 = Maize-Mung bean intercropping + Napier grass, T_3 = Maize-Black gram intercropping + Napier grass, T_4 = Maize-Groundnut intercropping + Napier grass and T_5= Maize–Cowpea intercropping + Napier grass. The tested crop varieties were BARI Hybrid Maize 17 (maize), BARI Mung-6 (Mung Bean), BARI Mash-3 (Black gram), BARI Badam-9 (Groundnut) and BARI Felon-1 (Cowpea). The results revealed that FAW infestation (%) was found lower at early growth stages and then increased gradually up to 30 days after sowing and then again decreased to some extent regardless of treatments. Among the intercropping treatments, the maximum cob infestation 26.7% was found in T_4 treatment which resulting 24.26% yield reduction as compared to sole maize (control). On the other hand, the minimum 5.03% yield reduction was recorded in T_2 treatment where cob infestation was only 18.00%. The highest grain yield 10.14 t ha^{-1} was recorded in the treatment T_1 *i.e.*, sole Maize which was statistically identical with the treatments T_2 (9.63 t ha^{-1}) i.e., maize-mung bean intercropping. The lowest grain yield (7.68 t ha^{-1}) was recorded in treatment T_4 *i.e.*, Maize-Cowpea intercropping. This is the 1st year result, so the experiment will be repeated in next year for final recommendation.

Picture 17: *On-going research on Maize - Legume intercropping as Push - Pull technique to control Fall Armyworm at the agronomic research field of BWMRI*

3.1.6 RESPONSE OF NEWLY EVOLVED WHEAT VARIETIES TO SOWING DATES

AKBAR HOSSAIN, AJ AONTI, MM RAHMAN, MM BAZZAZ (Dinajpur), MD. ILIAS HOSSAIN (Rajshahi), RABIUL ISLAM (Jashore) and TIMOTHY J KRUPNIK (CIMMYT)

Abstract

Optimum seeding time is an important management strategy for increasing wheat production in short and mild winter conditions like Bangladesh. Temperature above optimum leads to hider the physio-biochemical activities of plants. Too early sowing produces weak plants with poor root systems, while late-planted wheat shortens the duration of the life cycle for escaping high-temperature stress at the flowering to the grain-filling stage. In the last few years, Bangladesh Wheat and Maize Research Institute (BWMRI) released some new varieties. These were developed testing in optimum (Nov. 15-30) as well as late (Dec. 20-25) sown conditions. The performance of these varieties in the intermediate time of seeding and their location-specific performance is not known. In this context, the experiment was conducted in three Agro-ecological zones of Bangladesh i.e., BWMRI-Dinajpur; RWRC-Rajshahi; RARS-BARI, Jashore in consecutive six wheat seasons (2017-18, 2018-19, 2019-20, 2020-21, 2021-22 and 2022-23) to evaluate the performance of these varieties under different dates of sowing, to find out their optimum sowing time, variety location interaction and wheat blast response for a specific variety. In the first two seasons six existing elite wheat varieties i.e., 'BARI Gom 26', 'BARI Gom 28', 'BARI Gom 30', 'BARI Gom 31', 'BARI Gom 32' and 'BARI Gom 33', in the third year (2019-20) seven wheat varieties (six + newly released 'WMRI Gom 1') and in 4th , 5th and 6th years (2020-21, 2021-22 & 2022-23) seven wheat varieties ('BARI Gom 26', 'BARI Gom 30', 'BARI Gom 32', 'BARI Gom 33', 'WMRI 1', 'WMRI 2', 'WMRI 3') were evaluated in five sowing conditions started from 25 November to 4 January with 10 days interval. Under the environmental condition of Dinajpur, it was found that all of the wheat varieties sown at optimum sowing condition (25 Nov.) produced the maximum yield and also escaped the wheat blast (WB) disease in all five years in all locations. While the yield of all varieties was decreased, when sown at late in all three locations in all five seasons. Although, no WB incidence was recorded in the environmental condition of Dinajpur in all five sowing conditions, but in the location of Rajshahi and Jashore, WB infection was found in the last three sowings (i.e., 15 Dec., 25 Dec. and 04 January in the first two seasons; while WB was recorded in all sowing conditions in Jashore and Rajshahi in third, fourth and fifth seasons. Considering the yield performance of all varieties, 'BARI Gom 30' performed the best in all sowing conditions as well as late sown heat stress condition in Dinajpur, followed by 'BARI Gom 26', 'BARI Gom 32', BARI Gom 33, 'WMRI 1',WMRI 2 and 'WMRI 3'.

Picture 18: *Investigating the influence of sowing dates on newly evolved wheat varieties in trial studies, shedding light on advancements in crop management and productivity at Bangladesh Wheat and Maize Research Institute (BWMRI).*

Whereas, in the environmental condition of Rajshahi and Jashore, BARI Gom 33 performed the best, followed by 'BARI Gom 30', 'BARI Gom 32', 'WMRI 1', 'WMRI 3' and 'WMRI 2'. The maximum wheat blast severity in the location of Rajshahi and Jashore were observed with the variety 'BARI Gom 26', while the lowest wheat blast disease severity was found with the variety 'WMRI 3' and 'BARI Gom 33'. Variety 'WMRI 3', 'BARI Gom 30', 'BARI Gom 32' and 'WMRI 2' were also showed comparatively lower disease severity when exposed to high disease pressure at late sown condition in all three locations. After six years of observation, the CSISA research team, and BWMRI are provisionally able to conclude that there is a remarkable variety of location interaction with yield and disease incidence; as such, location- and sowing-date specific variety recommendations will be needed for optimal cropping. These results will be shared with the DAE in the next reporting period, and are anticipated to form the basis of new management recommendations that can be provided to farmers throughout Bangladesh.

3.1.7 VERIFICATION OF SOWING TIME OF NEWLY RELEASED MAIZE VARIETIES

MN ALAM, MM BAZZAZ, MA MIAH, ISLAM MZ, MM AKHTER, S AHMED, MM HOQUE, A AHMED, S HOSSAIN, MA HABIB, MAZ SARKER, G FARUQ

Abstract

To find out the optimum time sowing of newly released maize variety, the trial was conducted in the research field of Bangladesh Wheat and Maize Research Institute, Nashipur, Dinajpur in the season of 2022-23. The treatments were three sowing times viz. BARI Hybrid Maize 16 (V_1), BARI Hybrid Maize 16 (V_2), and BWMRI Hybrid Maize 1, and three sowing times viz. 1) 6 Nov (S_1), 2) 21 Nov (S_2), and 3) 6 Dec (S_3). The design was RCBD with 3 replications. The highest number of row per cob was observed in the late sowing (S_3) by $_{V2}$, but its lowest by V_2 in the optimum sowing (S_1). The lowest number of grain per cob was observed by V_2 in the optimum sowing (S_1), but the highest number of grain per cob in the late sowing (S_3) by V2. The lowest grain weight per cob was observed by V_3 in the optimum sowing (S_1), but tits highest in the late sowing (S_3) by V_3. The lowest grain yield was observed by V_3 followed by V_2 in the late sowing (S_3), but the highest grain yield in the optimum sowing (S_2) by V_1 followed by V_2. Therefore, BARI Hybrid Maize 16 and BARI Hybrid Maize 17 are better for sowing at the end of November, and both varieties are also better for sowing in the early time of December.

3.2 SOIL MANAGEMENT

3.2.1 RESPONSE OF DIFFERENT LEVELS OF NITROGEN ON YIELD AND YIELD COMPONENTS OF NEWLY REASLED MAIZE HYBRIDS

AKBAR HOSSAIN, AJ AONTI AND MM RAHMAN

Abstract

Nitrogen (N) fertilizer is considered as one of the most important factors affecting growth and grain yield of hybrid maize. This study was conducted to determine the effects of different rates of nitrogen and varieties on growth and yield of hybrid maize in Dinajpur from November 2022 to April 2023. Four different maize hybrid varieties (BARI hybrid maize-16 (BHM-16), BARI hybrid maize-17 (BHM-17), BWMRI Hybrid Maize-1, BWMRI Hybrid Maize-2) and three levels of nitrogen (276, 303 and 331 kg N ha-1) were evaluated using split plot design with three replications. The results showed that grain yield and yield attributing traits of hybrid maize varieties increased with the increasing level of nitrogen from 273 to 331 kg ha^{-1}. The application of nitrogen @ 303 kg N ha^{-1} produced the highest grain yield (16.33 t ha-1), while maximum thousand grain weight (412.35 g) was obtained @ 331 kg N ha^{-1}. The maize variety BWMRI hybrid maize-2 produced the highest grain yield (16.33 t ha^{-1}) and thousand grain weight (412.35g) as compared to other varieties. This study suggested that maize production can be maximized by cultivating BWMRI hybrid maize-2 with the use of 303 kg N ha^{-1}.

Picture 19: *Investigating the Influence of Diverse Nitrogen Levels on Yield and Yield Components of Newly Released Maize Hybrids*

PROJECT 4: PEST MANAGEMENT

The pest management initiatives encompass two distinct sub-projects: disease management and insect management. These divisions, namely the Division of Plant Pathology and the Division of Entomology, undertake specialized activities within each realm to ensure the health and productivity of wheat and maize crops. The Division of Plant Pathology is primarily responsible for addressing various diseases affecting wheat and maize. Within the context of wheat, the division focuses on researching diseases such as Bipolaris leaf blight, multiple rust types, and wheat blast. This involves an in-depth exploration of their causal organisms, the development of effective control measures, and comprehensive management strategies. Furthermore, the division extends its expertise to the management of diseases in maize crops, tackling challenges like stalk rot, leaf blight, and leaf rust. Vigilance in terms of disease surveillance and monitoring is another crucial facet of this division's activities. By systematically observing the prevalence and spread of diseases among wheat and maize crops, they contribute significantly to early detection and prevention efforts. On the other hand, the Division of Entomology focuses on the management of insects that impact both wheat and maize. A particularly noteworthy focus area for this division is the Fall Armyworm, a substantial threat to maize crops. The division dedicates its research efforts to this insect, alongside the examination of other maize-related pests. By conducting thorough research, the division aims to develop strategies for effective pest management and mitigation. Equally important is the division's attention to wheat insects and pests, encompassing a vigilant approach to monitoring their population dynamics. This proactive monitoring helps the division to anticipate and address the emergence of insects beyond the threshold levels that could cause economic damage to crops. Through the specialized research of pest management, disease control, and insect management initiatives, these divisions contribute significantly to maintaining the agricultural productivity and sustainability of these crucial crops.

SUB-PROJECT: 4.1 DISEASE MANAGEMENT

Diseases are one of the major constraints to wheat production in Bangladesh. Among them, Bipolaris leaf blight (spot blotch) caused by *Bipolaris sorokiniana* (Sacc.) Shoemaker is most important. The disease occurs every year in all wheat growing areas of the country with varying degrees of severity depending on cultivar, sowing time and location. The second most important disease is leaf rust caused by *Puccinia triticina* Eriks. The disease usually appears in mid-February under the agro-climatic condition of Bangladesh. It may cause severe yield losses if a susceptible variety is late sown and infection occurs early in the crop season. Wheat blast, a devastating wheat disease caused by *Magnaporthe oryzae* B.C. Couch (synonym *Pyricularia oryzae* Cavara) emerged for the first time in 2016 in several south-western and southern districts of Bangladesh. Disease severity appeared to vary from 5-100% with significant yield losses depending on cultivar susceptibility, sowing times and environmental conditions. The disease reappeared in the subsequent years with low level of infection, but spread to some previously uninfected wheat areas. In 2016, the disease was limited within eight districts but now it has been established and found in 25 districts. However, major wheat growing areas of Bangladesh i.e. north-western parts still remain free from wheat blast. Major research thrust has been given on screening and evaluation for disease resistance, epidemiology, testing fungicidal efficacy and disease monitoring in national and international nurseries and farmers' fields. Stem rust caused by *P. graminis* Pers. f. sp. *tritici* Eriks. & Henn. was observed in 2014 in the rust trap nurseries after three decades, but no Ug99 detected. Yellow rust caused by *P. triticina* occurs occasionally with low to moderate severity. So far none of the rusts has reached an epidemic level in Bangladesh, but damaging epidemics may occur, particularly if a new virulent race develops or is introduced. Other diseases of regular occurrence are seedling blight caused by *B. sorokiniana*, foot and root rot caused by *Sclerotium rolfsii* Sacc., head blight caused by *B. sorokiniana* and black point incited mainly by *B. sorokiniana* and *Alternaria alternata* (Fr.) Keiss.

Maize (*Zea mays* L.) is the second most important cereal crop of Bangladesh after rice in terms of area and production. The different diseases are the most important biotic constraints for maize cultivation in the country. Now-a-days, a number of diseases frequently observed in most of the farmers' fields with different levels of severity. Leaf blight, caused by *Exserohilum turcicum* and *Bipolaris maydis* are more common in most of the fields with varying level of infection. Leaf rust

caused by *Puccinia sorghi* is also observed frequently in the cultivated varieties. Fusarium Stalk Rot, an emerging threat for maize cultivation in Bangladesh which is caused by several species of *Fusarium*. The disease is more frequently observed from last year and the severity was 10-100%. It not only damages the maize plant, reduces its potential yield and its nutritional values but imposes threatening to the human life through the induction of mycotoxin development. The incidence and severity of the diseases were higher in Kharif season compared to Rabi season.

4.1.1 EVALUATION OF WHEAT GERMPLASM AGAINST BIPOLARIS LEAF BLIGHT UNDER FIELD CONDITIONS

K. MUSTARIN, K. K. ROY, M. T. A. TAUHID, M. M. K. SOHEL AND M. M. HOSSAIN

Abstract

Around 40 advanced wheat genotypes including susceptible and resistant checks were evaluated against Bipolaris leaf blight under natural field conditions in three different locations of Bangladesh. Among the entries evaluated, 10 lines were selected based on Area Under Disease Progress Curve (AUDPC), 1000-grain weight, grain yield and other agronomic characters assessed over locations. The AUDPC of the selected lines ranged from 103 to 253, while those of the check varieties ranged from 155 to 213. Grain yields of the selected entries varied from 419 to 514 g/plot, whereas 385 to 513 g/plot were obtained from the check varieties. Blast severity (disease index) of the selected entries recorded in Jashore varied from 0 to 18.5%.

Picture 20: *Bipolaris leaf blight resistance in wheat genotypes under natural field conditions*

4.1.2 EVALUATION OF WHEAT GENOTYPES FOR RESISTANCE TO BIPOLARIS LEAF BLIGHT UNDER INOCULATED FIELD CONDITIONS

K. MUSTARIN, K. K. ROY, M. T. A. TAUHID, M. M. HOSSAIN

Abstract

An effort was made to evaluate the reactions of 56 wheat genotypes including advanced lines and check varieties against Bipolaris leaf blight under inoculated field conditions during 2022-23 crop season. The screened varieties and lines showed different levels of resistance against the disease and were graded into different categories. Among them, 2 genotypes were found resistant, 5 moderately resistant, 14 moderately susceptible, 22 susceptible and rest of 13 as highly susceptible.

Picture 21: *Bipolaris leaf blight resistance in wheat genotypes under inoculated conditions*

4.1.3 EVALUATION OF WHEAT GENOTYPES FOR RESISTANCE TO LEAF RUST UNDER INOCULATED FIELD CONDITIONS

K. MUSTARIN, K. K. ROY, M. T. A. TAUHID AND M. M. HOSSAIN

Abstract

Seventy-eight (78) wheat genotypes were screened against leaf rust to find out resistance sources under inoculated field conditions conducted during 2022-23 cropping season at Bangladesh Wheat and Maize Research Institute, Dinajpur. From the study, a good number of lines/varieties (58) were found resistant and among them, four were completely free from leaf rust infection. Disease severity was comparatively lower which ranged from 0 to 70% with different types of reactions in the advanced lines, while 80% severity was observed in susceptible cultivar BARI Gom 24 (Prodip).

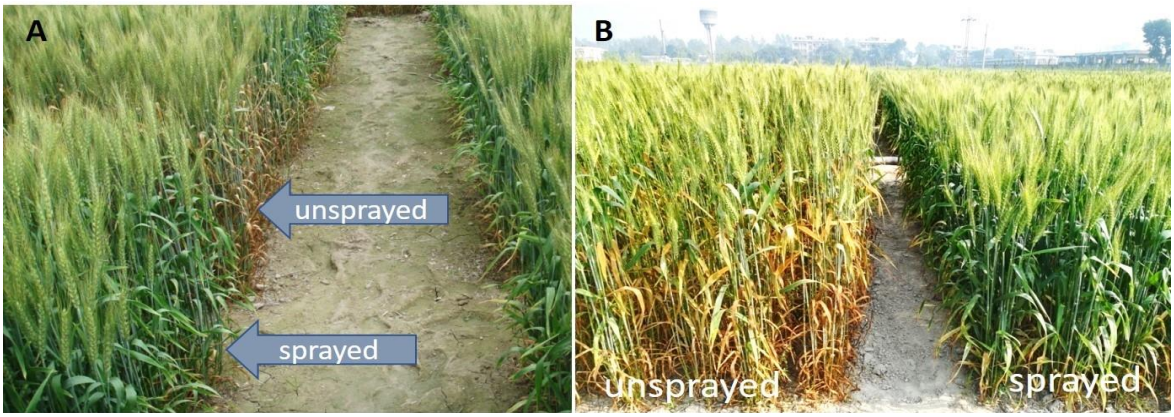
Picture 22: *Leaf rust resistance in susceptible and resistant cultivars under inoculated field conditions*

4.1.4 EFFICACY OF NEW FUNGICIDES IN CONTROLLING BIPOLARIS LEAF BLIGHT AND LEAF RUST OF WHEAT

K. MUSTARIN, K. K. ROY, M.T.A. TAUHID AND M. M. HOSSAIN

Abstract

Seven fungicides of different groups including five new were tested for their effectiveness in controlling Bipolaris leaf blight (BpLB) and leaf rust diseases of wheat under field conditions. All the tested fungicides were found effective against Bipolaris leaf blight and leaf rust diseases of wheat. Tested new fungicides were controlled BpLB 92 to 99% with 28 to 50% yield increase whereas rust controlled by 89 to 100% with 9 to 23% yield increased. The check fungicides Nativo 75 WG and Amister Top 325 SC controlled disease severity by 99 to 100% with increased yield of 9 to 54% for both the diseases.



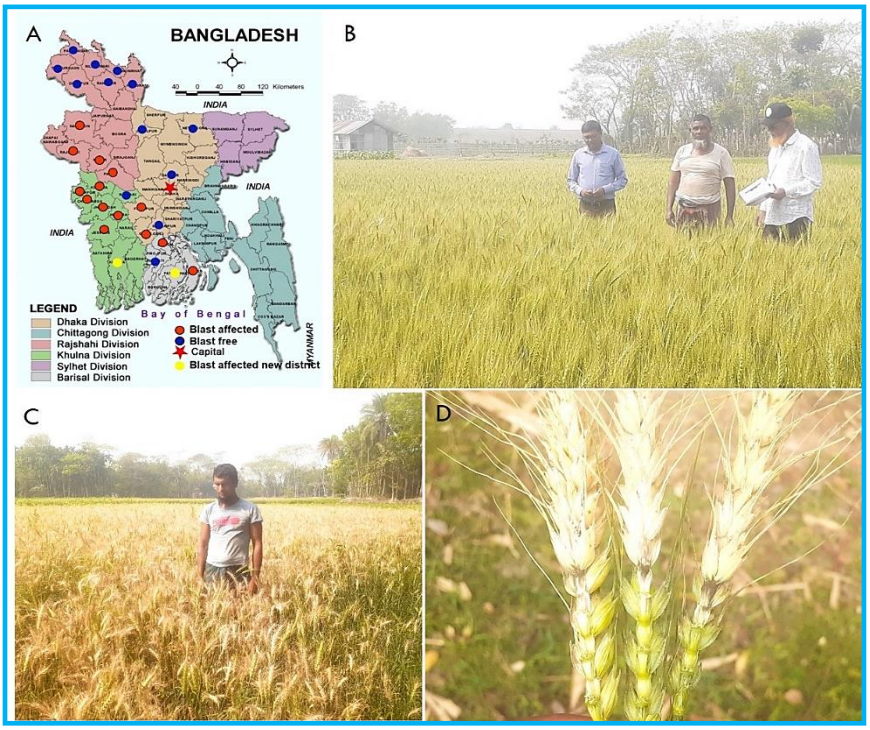
Picture 23: *Effectiveness of fungicides against (A) Bipolaris leaf blight and (B) leaf rust diseases of wheat*

4.1.5 SURVEILLANCE OF RUSTS AND BLAST OF WHEAT IN BANGLADESH

K. MUSTARIN, K. K. ROY, M. M. K. SOHEL, M. T. A. TAUHID, M. R. KABIR, M. M. RAHMAN, M. F. AMIN, M. R. ISLAM AND M. M. HOSSAIN

Abstract

A total of 30 districts were surveyed which covered 121 farmer's fields and trial sites of major wheat-growing areas of Bangladesh to know the current status of wheat blast and rusts diseases during 2022-23 cropping season. The survey was conducted following BGRI protocols developed for cereal rust assessment. Disease severity was estimated using 0-100 scale and the modified Cobb scale for blast and rust diseases, respectively. Out of 121 fields/sites surveyed, 43 fields/sites were found with the infection of wheat blast which was around 36% of total fields; while 54 fields were noticed with leaf rust incidence which was 45% of total surveyed fields. Among the 30 surveyed districts, 16 districts were identified with blast infection. Infected fields of Natore district were found with higher levels of blast infection in the late planted fields while the lowest level of blast infection was observed Barisal. For leaf rust disease, among 45% of infected fields, almost 61% of the infected fields showed low (<20%) levels of severity, 20% moderate (20-40%) and 19% with higher (more than 40%) severity. Regarding of varietal response, the older popular variety BARI Gom 26 found with low to high level of disease incidence with moderately susceptible to susceptible reaction while the latest adapted varieties BWMRI Gom 1 and BWMRI Gom 2 were found with moderate to high level of disease severity with moderately susceptible reaction. On the contrary, our newly released wheat variety BWMRI Gom 3 and BARI Gom 33 found zero to low level of disease incidence with moderately susceptible to susceptible reaction.



Picture 24: *Survey and monitoring of wheat diseases at different locations of Bangladesh; (A) Bangladesh map showing field surveillance areas, (B) investigation of wheat blast and rust incidence, (C) a severely blast affected field and (D) partially bleached spikes with black colored infection point*

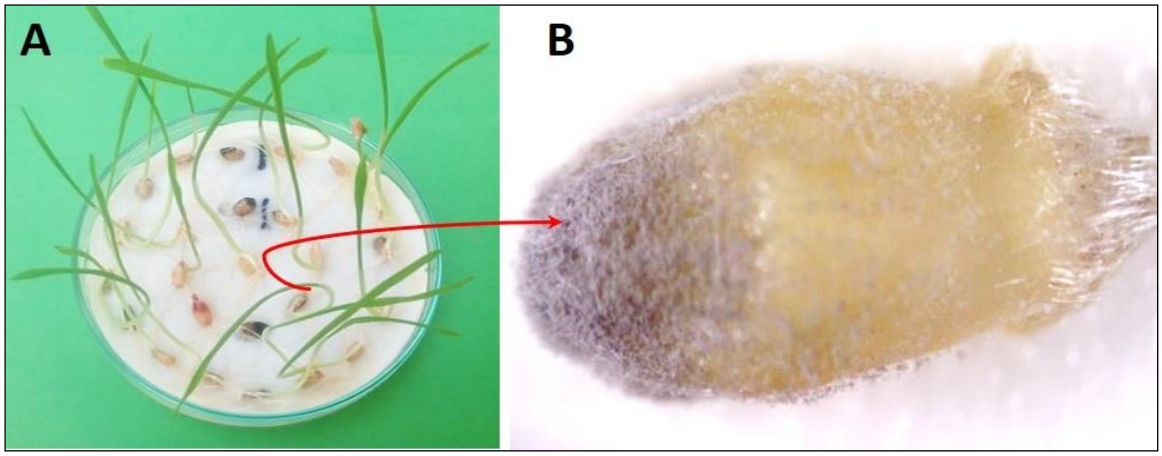
4.1.6 DETERMINING STATUS OF SEED-BORNE FUNGI INCLUDING *Magnaporthe oryzae* CAUSING WHEAT BLAST

K. MUSTARIN, K. K. ROY, R. BEGUM, T. ROY, M. T. A. TAUHID, M. A. A. KHAN, K. AKHTER AND M. M. HOSSAIN

Abstract

An effort was made to determine the incidence of *Magnaporthe oryzae* and other seed-borne fungi associated with wheat seeds of eight varieties named BARI Gom 26, BARI Gom 30, BARI Gom 32, BARI Gom 33, BWMRI Gom 1, BWMRI Gom 2, BWMRI Gom 3 and BWMRI Gom 4 collected from five different stations of Bangladesh. Results showed that *Magnaporthe oryzae* and seed-borne prevalence of other fungi varied over locations, varieties and sowing time. A total of 18 fungi were identified from seed samples of different locations. The overall *M. oryzae* incidence was estimated

very low (0.27%). The lowest incidence of *M. oryzae* was observed in BWMRI Gom 4 (0.04%) while the highest was recorded in BARI Gom 26 (0.58%) followed by BARI Gom 30 (0.36%) and BWMRI



Picture 25: *Seed health test for determining incidence of seedborne fungi; (A) blotter paper test of wheat seed and (b) growth of Magnaporthe spores on wheat seed*

Gom 1 (0.36%). *M. oryzae* was observed only in Jashore location seeds under late planted crops. The maximum prevalence of *Bipolaris sorokiniana* detected in the seeds sampled close to 7.35%. Incidence of different pathogens always higher in late planted crops compared to optimum.

4.1.7 EVALUATION OF WHEAT GERMPLASM AGAINST WHEAT BLAST UNDER INOCULATED FIELD CONDITIONS

K. K. ROY, K. MUSTARIN, M. T. A. TAUHID, M. M. K. SOHEL AND M. M. HOSSAIN

Abstract

A cohort of 320 entries were screened against wheat blast under inoculated conditions at Regional Station, Bangladesh Wheat and Maize Research Institute (BWMRI), Jashore and field conditions at BWMRI, Dinajpur during 2022-23 crop growing season. Among the entries evaluated, 19 lines were selected based on disease index, 1000-grain weight, grain yield and other agronomic characters. Blast severity was recorded only in Jashore. The percentage of disease index of the selected lines ranged from 2.90 to 12.20% while those of the susceptible check BARI Gom 26 displayed >90% and resistant varieties BWMRI Gom 3 was close to 7% and BARI Gom 33 with no disease infection.

Picture 26: *Germplasm screening against wheat blast under inoculated conditions; (A) Magnaporthe spore inoculation on genotypes and (B) response of resistant and susceptible varieties to wheat blast*

Grain yields of the selected entries varied from 525 to 730 g/plot.

4.1.8 EVALUATION OF ELITE WHEAT GENOTYPES FOR RESISTANCE TO WHEAT BLAST UNDER INOCULATED FIELD CONDITIONS

K.K. ROY, M. M. K. SOHEL, K. MUSTARIN, M. T. A. TAUHID AND M. M. HOSSAIN

Abstract

A cohort of elite bread wheat lines (40) from diverse sources including susceptible/resistant checks were evaluated against wheat blast under inoculated field conditions at Regional Station (RS), Bangladesh Wheat and Maize Research Institute (BWMRI), Jashore during 2022-23 cropping season. The design of the study was randomized complete block (RCB) with 3 replications and seeds were sown under late seeding conditions (fourth week of December). The elite wheat lines showed varying levels of disease reaction against the disease. In this trial, 26 genotypes were found resistant having 0.3 to 8.4% disease index. The resistant variety BARI Gom 33 was found resistant (1.8%) while the susceptible variety BARI Gom 26 demonstrated 73.7% disease index. The recently released resistant variety BWMRI Gom 3 showed highly resistant (2.9%) reaction to the disease. Some other elite lines were also found promising. These lines need to be evaluated again under greenhouse conditions for confirming their resistance against the disease to the upcoming cropping cycle.

Picture 27: *Response of elite genotypes against wheat blast under inoculated conditions; (A) resistance in resistant/susceptible varieties and (B) response of elite lines to wheat blast*

4.1.9 EFFICACY OF NEW FUNGICIDES IN CONTROLLING WHEAT BLAST

K. K. ROY, M. M. K. SOHEL, K. MUSTARIN, M. T. A. TAUHID AND M. M. HOSSAIN

Abstract

Seven chemical fungicides of different groups (sole and combined) were evaluated for their effectiveness in controlling wheat blast under field conditions at Regional Station, BWMRI, Jashore during 2022-23 cropping season. The design of the experiment was randomized complete block (RCB) with 3 replications. The tested fungicides were Nativo 75 WG, Amistar Top 325 SC, Ricoipro 52.5 WP, Kazuki 28 SC, Navara 28 SC, Veer 70 WP and Axobin 32.5 SC. Among seven fungicides, five including checks were found effective in controlling the disease (78-97%) as compared to the control treatment. The new fungicides Kazuki 28 SC, Navara 28 SC and Axobin 32.5 SC displayed 78-88% disease control while the fungicide Axobin 32.5 SC (67%) showed least. The check Nativo 75 WG was found the most effective in controlling wheat blast (97%). The maximum yield increases of 121% was obtained from the fungicide Nativo 75 WG which followed by Amister Top 325 SC (113%). The highest net profit was obtained from spraying with Nativo 75 WG (Tk. 59,175) while the lowest with treatment Veer 70 WP (Tk. 22,080).

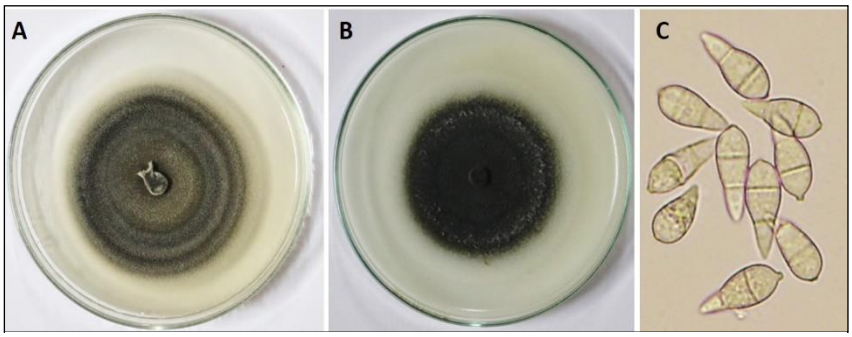
Picture 28: *Efficacy of fungicide in controlling wheat blast; (A) Nativo 75 WG sprayed plot and (B) unsprayed plot*

4.1.10 SPORULATION CAPACITY OF *Magnaporthe oryzae* (MoT) IN DIFFERENT CULTURE MEDIA AND IDENTIFYING VIRLUENT ISOLATE

K. K. ROY, M. R. KABIR, R. BEGUM, T. ROY, K. AKTER, M. A. A. KHAN, K. MUSTARIN, M. T. A. TAUHID AND M. M. HOSSAIN

Abstract

The experiment was conducted under laboratory and greenhouse conditions of Bangladesh Wheat and Maize Research Institute (BWMRI), Dinajpur during 2022-23 crop cycle. Our results demonstrated that the most suitable sporulating medium was oat meal agar (OMA) followed by wheat leaf agar (WLA) and corn meal agar (CMA). Among ten evaluated isolates, the isolates RAJB220003, JAL220001 and MAG220001 were found high sporulating as compared to others. Variations in morphological characters was observed among the isolates cultured on potato dextrose agar (PDA) medium. The front colony for most of the isolates was black to gray or brown to gray colored, but for some of them had different color. The colony surface of different isolates varied from smooth flattened and fluffy mycelia, and some were with the presence of concentric rings. On the other hand, the present investigation revealed that the isolates with high virulence was prevalent in the studied *M. oryzae* populations. The isolates MEH220006, KUS220005, FAR220003 were identified more virulent as compared to others.



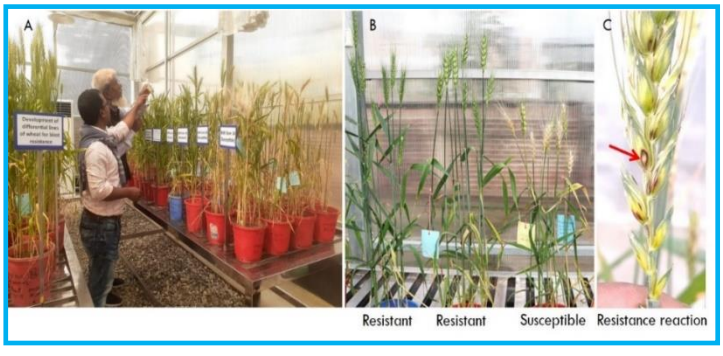
Picture 29: *Pure culture of Magnaporthe oryzae (MoT) fungus; (A) on potato dextrose agar, (B) on oat meal agar and (C) microscopic view of 3-celled hyaline conidia*

4.1.11 DEVELOPMENT OF DIFFERENTIAL LINES AGAINST WHEAT BLAST

K. K. ROY, M. R. KABIR, R. BEGUM, T. ROY, K. AKTER, M. A. A. KHAN, K. MUSTARIN, M. T. A. TAUHID AND M. M. HOSSAIN

Abstract

Wheat blast (WB) caused by *Magnaporthe oryzae* pathotype *Triticum* (MoT) is an important fungal disease in tropical and subtropical wheat production regions. Genetic resistance is only the durable way to get crop free from disease. So far, 2NS is the only the stable source for blast resistance. From our study, six genotypes have been identified with high level of resistance under greenhouse conditions. Molecular analysis will be performed for presence of any new gene or stable resistance sources to the coming years.



Picture 30: *Development of differential set through screening of resistant lines with virulent isolates*

4.1.12 EFFECT OF SOWING DATES AND GENOTYPES ON THE SEVERITY OF WHEAT BLAST

K. K. ROY, M. M. K. SOHEL, K. MUSTARIN, M. T. A. TAUHID AND M. M. HOSSAIN

Abstract

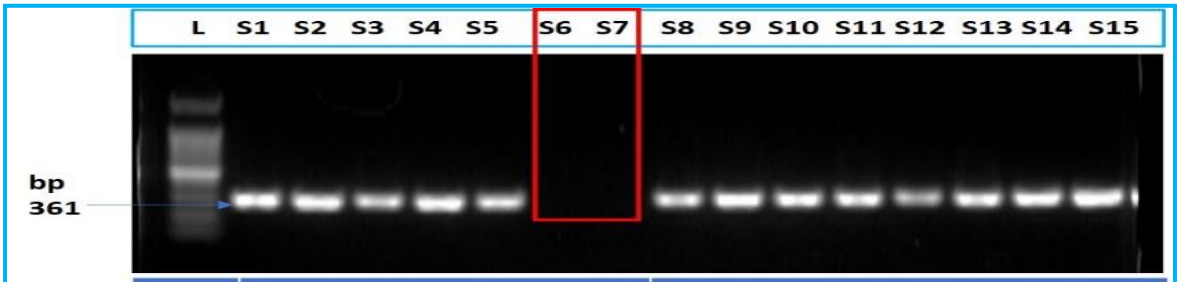
A field study on sowing dates and genotypes was conducted at Regional Station, BWMRI, Jashore during 2022-23 crop growing season. The objective of the work was to assess the effect of sowing time on the severity of wheat blast in different adapted wheat varieties. The evaluated genotypes were BARI Gom 26, BARI Gom 30, BARI Gom 32, BARI Gom 33, BWMRI Gom 1, BWMRI Gom 2 and BWMRI Gom 3 while the five sowing dates were commenced from 25 November 2022 to 4 January 2023 with 10 days interval. Results revealed that sowing time and genotypes sole had impact in reducing disease severity, and in combined of them were also significantly affected on spike infection, spike area damaged and percent disease index. Wheat planted at optimum time (25 November and 5 December) had minimum disease or no disease at all, but it increases with delay of sowing. The highest percentage of disease index was observed under very late seeding conditions (04 January) than other sown dates. In considering genotypes, the upmost disease index was observed in the variety BARI Gom 26 (susceptible) which was up to 85.5% under 04 January sown plots, while the lowest disease index was found for the varieties BARI Gom 33 and BWMRI Gom 3 (0.3 to 1.2% disease index) under late seeding conditions.

4.1.13 MOLECULAR DETECTION OF WHEAT BLAST PATHOGEN *Magnaporthe oryzae* pathotype *Triticum* (MoT) USING MoT3 ASSAY

K.K. ROY, K. MUSTARIN, M. T. A. TAUHID AND M. M. HOSSAIN

Abstract

Wheat blast is a devastating disease persistent in South America, Bangladesh and Zambia, and now becoming a global concern. *Magnaporthe oryzae* is a fungal plant pathogen causing blast disease in several species of the Poaceae family. It includes several genetic lineages, including one that is pathogenic on wheat and belongs to the *Triticum* lineage of *M. oryzae*. Confirmation of plant pathogen can be done by various way and among them, molecular testing is one of the best. Last year, a total of 15 isolates were successfully amplified by the MoT3 markers confirming as *Triticum* pathotype of wheat blast. These isolates were also amplified for ITS regions using ITS4 and ITS5 primer sets, and used for sequencing. After sequencing, a neighbor joining phylogenetic analysis was done for the mentioned isolates sequences with other publicly available ITS sequences of *Pyricularia* spp. Phylogenetic tree results demonstrated that our isolates were identical to wheat blast isolates from South American sources.



SL	Sample ID	Source of Isolates
1	S1 - S5	Wheat Spike
2	S6 & S7	Rice Panicle
3	S8 - S15	Wheat Spike
4	L	Ladder

Picture 31: *Amplification of MoT specific gene confirming the Triticum pathotype of Magnaporthe oryzae during molecular detection assay*

4.1.14 HELMINTHOSPORIUM LEAF BLIGHT SCREENING NURSERY

M. M. K. SOHEL, M. T. A. TAUHID, K. MUSTARIN, K. K. ROY, M. M. RAHMAN, M. R. ISLAM AND M. M. HOSSAIN

Abstract

A field experiment was conducted to screen 52 bread wheat lines including checks against *Helminthosporium* leaf disease under natural field conditions of disease development in three different station of Bangladesh. Among the entries evaluated, seven lines were selected based on AUDPC (BpLB), disease index (Blast), 1000-grain weight, grain yield and other agronomic characters assessed over locations. The AUDPC of the selected lines ranged from 102 to 200, while those of the check varieties ranged from 177 to 211. Grain yields of the selected entries varied from 337 to 547 g/plot, whereas 397 to 580 g/plot were obtained from the checks. Blast severity of the selected entries recorded in Jashore varied from 0 to 3%. Days to heading, plant height and 1000-grain weight of the selected lines were within the acceptable range.

4.1.15 STEM RUST RESISTANCE SCREENING NURSERY

M. M. K. SOHEL, M. T. A. TAUHID, K. MUSTARIN, K. K. ROY, M. M. RAHMAN, M. R. ISLAM AND M. M. HOSSAIN

Abstract

A nursery from CIMMYT-Mexico having 104 wheat entries including local checks were evaluated for their response to stem rust and other diseases under field conditions in three different locations of Bangladesh. Among the entries evaluated, 4 lines were selected based on Bipolaries leaf blight severity, blast disease index, grain yield and agronomic performance assessed over locations. Stem rust was not noticed over the locations. The area under disease progress curve (AUDPC) of the selected lines ranged from 101 to 154 while the check varieties showed 133 to 177. Grain yields of the selected entries varied from 435 to 498 g/plot, whereas 419 to 579 g/plot observed in check varieties. Blast severity of the selected entries recorded in Jashore varied from 0.4 to 6%. Days to heading, plant height and 1000-grain weight of the selected lines were within the acceptable range.

4.1.16 FUSARIUM HEAD BLIGHT SCREENING NURSERY

M. M. K. SOHEL, M. T. A. TAUHID, K. MUSTARIN, K. K. ROY, M. M. RAHMAN AND M. M. HOSSAIN

Abstract

A nursery from CIMMYT-Mexico with 52 wheat entries including local checks was evaluated for their response to Fusarium Head Blight (FHB) under natural conditions during 2022-23 cropping season in two locations- Dinajpur and Jamalpur. Among the entries evaluated, four were selected based on area under disease progress curve (AUDPC) of Bipolaris leaf blight, 1000-grain weight, grain yield and other agronomic characters. The incidence of FHB was not observed in the screened materials. The AUDPC of the selected lines ranged from 102 to 195 while the check varieties ranged from 137 to 171. Grain yields of the selected entries varied from 420 to 477 g/plot whereas 310 to 638 g/plot were obtained from the checks. Days to heading, plant height and 1000-grain weight of the selected lines were within the acceptable range.

Picture 32: *Identification of best IDM (cultivar + fungicide + crop rotation/planting time) practices for WB management; (A) field view of the experiment, (B) experimental treatment planted in different dates,*

4.1.17 INTEGRATED MANAGEMENT OF WHEAT BLAST

M. M. K. SOHEL, K. K. ROY, K. MUSTARIN, M. T. A. TAUHID AND M. M. HOSSAIN

Abstract

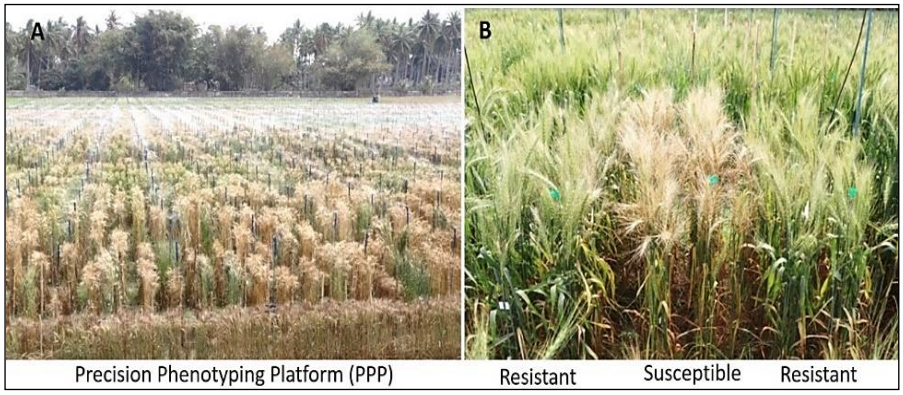
Integrated plant disease management (IDM) can be defined as a decision-based process involving coordinated use of multiple tactics for optimizing the control of pathogens in an ecologically and economically situation. This experiment was conducted to identify the best integrated disease management (cultivar + fungicide + planting time) practices for wheat blast management. Our findings showed that all three sowing dates had blast infection in both varieties but it was less when applied fungicides. The susceptible variety BARI Gom 26 got higher (100%) level of infection, while the variety BARI Gom 33 with very low (6%) disease frequency under very late seeding conditions. The susceptible variety BARI Gom 26 when planted in optimum and late seeding conditions by applying foliar spray and seed treatment have been affected by less disease, while the variety BARI Gom 33 displayed minimum disease infection under all seeding conditions without applying fungicides. The findings of this study include the optimum sowing date, resistance sources and applying of effective fungicide is helpful for sustainable blast management.

4.1.18 WHEAT BLAST: PRECISION PHENOTYPING PLATFORM

K. K. ROY, M. R. KABIR, M. A. A. KHAN, R. BEGUM, T. ROY, M. A. A. KHAN, K. AKTHER, M. R. ISLAM, M. M. K. SOHEL, K. MUSTARIN, M. T. A. TAUHID, M. M. HOSSAIN AND P. K. SINGH

Abstract

Four thousand three hundred eighteen (4318) wheat genotypes (bread wheat, synthetics, winter wheat, wild relatives, land races) consisted from different sources along with susceptible/resistant checks were evaluated against wheat blast under inoculated field conditions to identify resistance sources for the disease. The experiment was conducted at Regional Station, Bangladesh Wheat and Maize Research Institute (BWMRI), Jashore during 2022-23 crop growing season. Favorable environment for disease development was created by providing mist irrigation and hand inoculation of *Magnaporthe* spores to the materials. Disease note was taken on percentage of spike infected and percentage of diseased area on infected spike. As per the results obtained, varying levels of disease severity was recorded among the lines evaluated. Among the screened genotypes, 1046 (25%) lines were graded as resistant, 237 (6%) lines moderately resistant, 184 (4%) lines moderately susceptible, 304 (7%) lines susceptible and the rest of 2370 (57%) lines as highly susceptible. Among 1046 resistant lines, 453 (11%) entries were found completely free from blast infection. The resistant variety BARI Gom 33 found with <7% disease index while the susceptible variety BARI Gom 26 demonstrated >80% infection.



Picture 33: *Germplasm screening against wheat blast under inoculated conditions; (A) precision phenotyping platform for germplasm screening and (B) response of elite lines to the disease*

4.1.19 SURVEY AND MONITORING OF MAIZE DISEASES IN BANGLADESH

K. K. ROY, K. MUSTARIN, M. T. A. TAUHID, M. M. K. SOHEL AND M. M. HOSSAIN

Abstract

A field survey and monitoring program was conducted in different districts of Bangladesh during 2022-23 cropping season to obtain recent information on maize diseases. A total of 33 fields and trial sites were surveyed in 7 districts of Bangladesh and during surveillance, eight (8) diseases had been noticed. Among the diseases, leaf blight, *Fusarium* stalk rot, leaf rust and sheath blight were found as major with varying levels of severity while some other diseases cob rot, seedling blight, bacterial stalk rot, and leaf mosaic were observed as minor with lower levels of infection in the surveyed fields. The level of disease severity was comparatively higher in Kharif season compared to Rabi.

Picture 33: *Survey and monitoring of maize diseases in farmers field; (A) investigation of maize diseases, (B) a severely leaf blight affected field, (C) maize leaf with severe infection of rust disease and (D) dried-up maize stalks affected by the pathogen Fusarium spp. (Fusarium stalk rot disease)*

4.1.20 EFFICACY OF FUNGICIDES IN CONTROLLING LEAF BLIGHT OF MAIZE

K. MUSTARIN, K. K. ROY, M. T. A. TAUHID AND M. M. HOSSAIN

Abstract

Leaf blight of maize, is a severe disease affecting maize crop in Bangladesh. This disease causes considerable losses in maize crop every year. To avoid this loss, a study was conducted to check the efficacy of six fungicides against leaf blight disease of maize. The experiment was conducted at Plant Pathology Division's block at BWMRI Dinajpur during Rabi season 2022-23. The tested fungicides were Nativo 75 WG, Amistar Top 325 SC, Tilt 250 EC, Kazuki 40 SC, Carboten 40 SC and Suijin 72 WP. The result showed that Amister Top 325 SC and Tilt 250 EC (91%) were found to be the most effective fungicides to control leaf blight of maize followed by Nativo 75 WG and Suijin 72 WP (89%). The Carboten 40 SC was found comparatively less effective than the others.

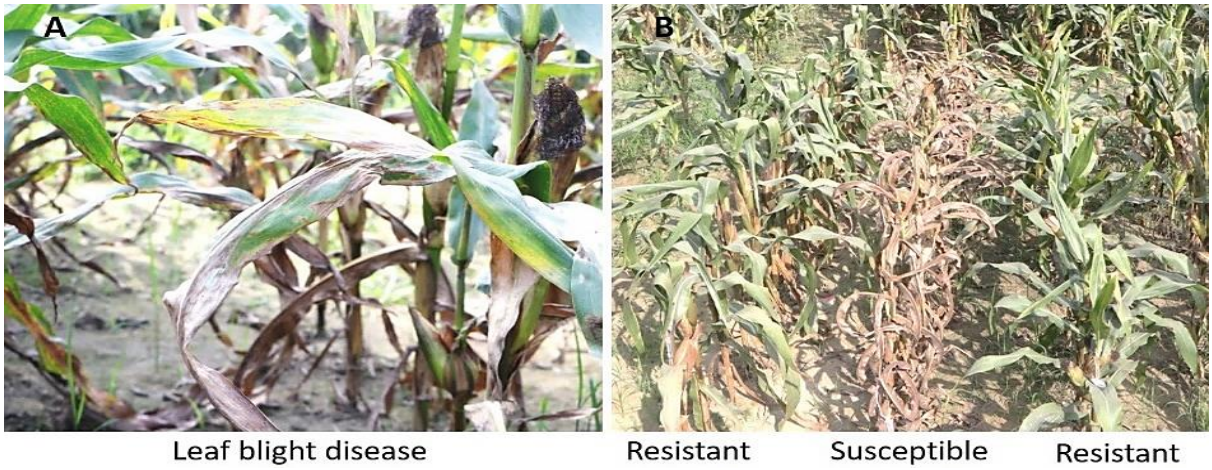
4.1.21 DISEASE EVALUATION OF MAIZE GENOTYPES IN DIFFERENT TRIALS OF BWMRI MAIZE BREEDING DIVISION

K. MUSTARIN, K. K. ROY, M. T. A. TAUHID, J. B. AZIM, M. M. HOQUE AND M. M. HOSSAIN

Abstract

A total of 154 genotypes from 6 different nurseries were evaluated for their performance against four common maize diseases viz. leaf blight, leaf rust, sheath blight and Fusarium stalk rot during Rabi season 2022-23. All the genotypes from all nurseries were affected by leaf blight disease with low levels of severity (5-15%). Leaf rust incidence was found in 10 genotypes of one nursery and the

severity was low. While the emerging disease- Fusarium stalk rot was completely absent in all the nurseries. Sheath blight was found in only two genotypes NH 7720 and BARI Sweet corn 1 with 1 and 4% severity, respectively. BWMRI released recent variety BWMRI Hybrid Bhutta 2 including other released varieties have showed good performance against all the mentioned diseases. The commercial varieties have also been found disease free or low disease infection.



Picture 34: *Screening of different nurseries against maize diseases; (A) severely blighted leaves and (B) response of genotypes against blight disease*

4.1.22 EVALUATION OF MAIZE GENOTYPES AGAINST FUSARIUM STALK ROT UNDER FIELD CONDITIONS

K. MUSTARIN, K. K. ROY, M. T. A. TAUHID AND M. M. HOSSAIN

Abstract

A total of 21 genotypes were evaluated for their performance against Fusarium stalk rot (FSR) under field conditions during Rabi season 2022-23 at BWMRI Dinajpur. The highest disease incidence was found in Pina 10 x BIL 28 (15%) followed by Pina 10 x BIL 28 (13.5%) and BWMRI Hybrid Bhutta 1 (12.5%). Out of 21 genotypes, 18 genotypes were categorized as resistant and rest 3 were moderately resistant. Ten genotypes were found free from FSR infection. The recently released variety BWMRI Hybrid Bhutta 2 displayed low level of disease incidence (5%).

4.1.23 EFFICACY OF NEW FUNGICIDES IN CONTROLLING LEAF RUST OF MAIZE

K. MUSTARIN, K.K. ROY, M.T.A. TAUHID AND M.M. HOSSAIN

Abstract

Six fungicides Nativo 75 WG, Amistar Top 325 SC, Tilt 250 EC, Kazuki 40 SC, Carboten 40 SC and Suijin 72 WP were evaluated against leaf rust of maize during Rabi season 2022-23 at BWMRI Dinajpur. All the fungicides were found effective for controlling the disease. The new fungicide Kazuki 40 SC was found the most effective to control the disease upto 88% followed by Nativo 75 WG and Amistar Top 325 SC (80%).

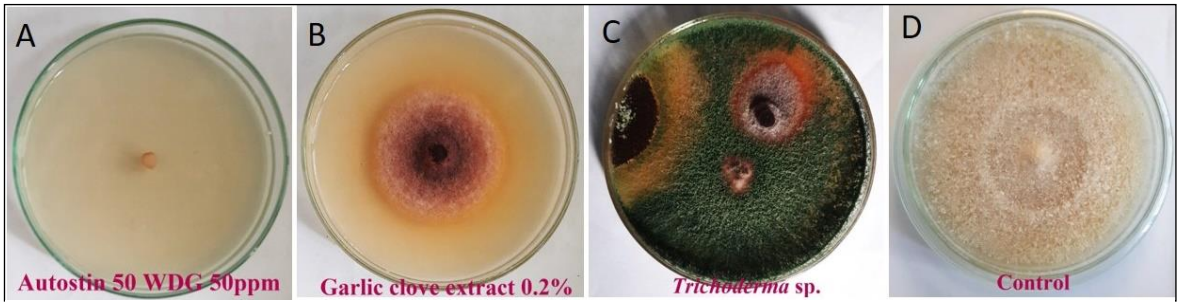
Picture 35: *Efficacy of fungicide in controlling leaf rust of maize; (A) Kazuki 40 SC sprayed plot and (B) unsprayed plot*

4.1.24 IN VITRO INHIBITORY EFFECT OF FUNGICIDES, BIO-AGENTS AND BOTANICALS ON MORPHO-PHYSIOLOGICAL CHARACTERS OF *Fusarium* SPECIES, THE CAUSE OF FUSARIUM STALK ROT OF MAIZE

M. T. A. TAUHID, K. MUSTARIN, K. K. ROY AND M. M. HOSSAIN

Abstract

Four chemical fungicides viz. Indofil M-45, Autostin 50 WDG, Tilt 250 EC and Amistar Top 325 SC; one bio-control agent viz. *Trichoderma* spp. and two botanicals viz. neem leaf extract and garlic clove extract with different concentrations were tested in-vitro against the pathogen *Fusarium* spp. Among the chemical fungicides, Autostin 50 WDG and Tilt 250 EC completely inhibited the fungal growth of *Fusarium* at all concentrations. The fungicide Amistar Top 325 SC also inhibited the fungal growth effectively (97-99%). Between two botanicals, neem leaf extract was found as successful inhibitor of the pathogen growth with 93 and 94% at 0.1 and 0.2% concentrations, respectively while garlic clove extract with moderate level of inhibition (48 and 63%). The biocontrol agent was performed better which inhibited the fungal growth by 92%.



Picture 36: *In-vitro inhibitory effect of chemical fungicide, botanical and bio-agent against mycelial growth of Fusarium sp.; (A) complete suppression of fungal growth by Autostin 50 WDG, (B) around 50% growth suppression of the fungus by applying botanical- garlic clove extract, (C) inhibition of Fusarium growth culturing with bio-control agent Trichoderma sp. and (D) growth of the fungus under control treatment (untreated).*

SUB-PROJECT: 4.2 INSECT MANAGEMENT

Insect pests are one of the major constrains for the production of maize in Bangladesh. There are several insects those can infest maize in different crop growth stage. The common insects in Bangladesh are cutworm (*Agrotis ipsilon* L.), stem borer (*Sesamia inferens*/ *Chilo pertellus*), Common armyworm (*Spodoptera litura*), Fall Armyworm (*Spodoptera frugiperda*), Corn earworm (*Helicoverpa zea* L.) etc. Since 2018, after first invasion of Fall Armyworm in Bangladesh, it becomes major and serious pest especially for maize crop. After three years of invasion this insect spread over the country. Last annual research report of Bangladesh Wheat and Maize Research Institute (BWMRI) showed this insect has ability to damage crop yield up to 39%. Therefore, Entomology Division of BWMRI emphasizes on the development of bio-rational and sustainable management technique of Fall Armyworm. Besides, surveillance and monitoring of insect pests and beneficial insects of wheat and maize has been continuing. Entomology Division has established a molecular laboratory and insectarium to strengthen research facilities. Right now, the division is giving prominence on morphological and molecular identification of insects of wheat and maize and their natural enemies

Picture 37: *Research activities in Entomology Laboratory*

Picture 38: *BWMRI Insectarium*

4.2.1 DETERMINATION OF EXPOSURE TIME PRIOR TO SEED SOWING AFTER TREATMENT WITH CYANTRANILIPROLE AGAINST FALL ARMYWORM ON MAIZE

MD MOSTAFIZUR RAHMAN SHAH AND MOST SIRAJUM MUNIRA

Abstract

Maize is attacked by Fall Armyworm (FAW), is quite serious and may cause considerable yield loss of the crop in Bangladesh. Cyantraniliprole (Fortenza) a newly registered seed treating chemical against FAW, *S. frugiperda* in Bangladesh. The exposure time after seed treatment before seed sowing is unknown. Therefore, the study of seed treatment with Cyantraniliprole and expose for different times after treatment viz. 0H, 4H, 8H,12H, 24H, and untreated seeds and the leaf infestation by FAW on those treated seeds were examined. All the treatments except T_6 (Control) had suppressed infestation below 15% up to 25 DAS whereas 22.67% infestation observed for T_6 at 25 DAS. Studies revealed that after one month of seed sowing, leaf infestation was around 20% for the treatments of T_3, T_4, T_5 which may suggest that cyantraniliprole has ability to protect FAW up to one month. Results, suggested that farmers may expose the maize seeds after Cyantraniliprole treatment for 8-24 hours according to their convenience.

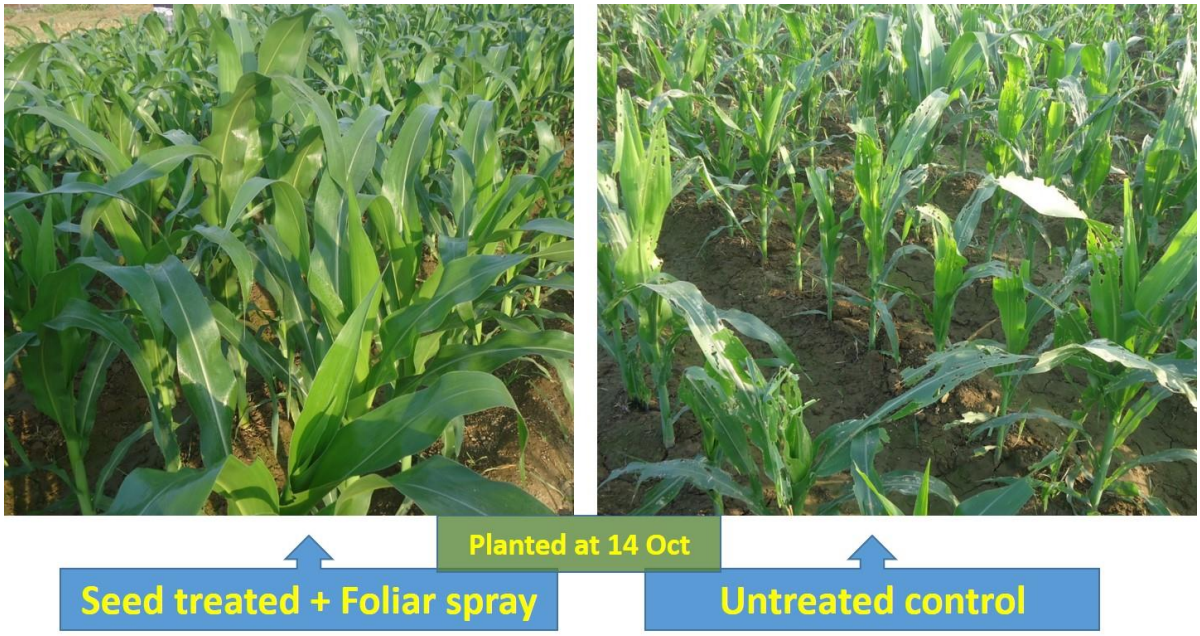
Picture 39: *Pictorial view of Cyantraniliprole treatments on maize seeds*

4.2.2 YIELD LOSS ASSESSMENT DUE TO FALL ARMYWORM (*Spodoptera frugiperda*) ATTACK ON MAIZE

M MOSTAFIZUR RAHMAN SHAH & MOST SIRAJUM MUNIRA

Abstract

Fall Armyworm (FAW), *Spodoptera frugiperda* (Lepidoptera: Noctuidae) is a new insect pest in Bangladesh since late of 2018 and from that period its infestation area increased in different districts. It can infests about 84 crop species where maize is one of the most preferred crops. The study has been carried out in 2022-2023 at BWMRI research field to estimate yield loss due to the attack of FAW on maize. BWMRI hybrid Bhutta 1 was grown in split plot design with three replications in October, November, December, January, February, and March. Only two treatments were considered in each month i.e. T_1 = treated (maize seed treated with Cyantraniliprole + alternate foliar spray with bio-pesticide and chemical pesticides) and T_2 = untreated control. The objective of the study was to compare the yield of the treated plot with that of the untreated plot and to observe which month is more favorable for FAW infestation. The study revealed that infestation level of FAW was less in cooler month e.g. November, December and January than the warmer month i.e. March, February and October. The highest yield was obtained from December planted maize with proper control measure and the lowest yield was from March planted maize without any control measure.



Picture 40: *Treated (Seed treatment + Alternate spray with SfNPV and Chemical insecticides) plot and untreated control plot of maize attacking Fall Armyworm*

4.2.3 AGRO ECOLOGICAL APPROACHES BOOST UP THE SUSTAINABLE MANAGEMENT OF FALL ARMYWORM, *Spodoptera frugiperda* ON MAIZE

MD MOSTAFIZUR RAHMAN SHAH & MOST SIRAJUM MUNIRA

Abstract

Maize is important cereal crops in Bangladesh due to its high demand in feed industry, human consumption, and starch production. One of major inhibits to maize production is insect pest. Among the insect pests Fall Armyworm, *Spodoptera frugiperda* is an invasive and devastating pest of maize in Bangladesh. An agro-ecological approach has been studied to combat the *S. frugiperda* from the last three season of 2020-21, 2021-22, & 2022-23. First year trial has been conducted at three locations, Dinajpur, Rajshahi, & Gazipur sites and latest two years has been conducted at two locations, Dinajpur & Rajshahi sites. Studies were tested as cowpea intercropping with different spacing (2020-21 & 2021-22), and

Picture 41: *Agro-ecological management of Fall armyworm A) Maize intercropped with coriander; B) Sole maize; C) Maize incorporated with cowpea*

cowpea and coriander intercropping with recommended spacing (2022-23). During study period, monitoring results showed that pest population pressure upsurges from February and goes to peak level at March then from Aril it has been declining. More number of predatory and pollinator insects were observed in the intercropped field. Foliage damage was higher in the mono crop maize field than intercropped field. Cob damage did not varied among the treatments but varied among the locations. Yield contributing character varied among the treatments especially for spacing and locations. Higher yield was obtained from 60cm spacing than 90cm and higher economic return was attained from intercropped treatments. Therefore, it can be concluded that intercropped with cowpea or coriander suppress the Fall Armyworm on maize at tolerable level, create environment for beneficial insects and increase net return.

4.2.4 VALIDATION TRIALS ON THE DEVELOPED IPM PACKAGE FOR MAIZE IN FARMERS' FIELD

MD MOSTAFIZUR RAHMAN SHAH & MOST SIRAJUM MUNIRA

Abstract

Maize is now a days an important cereal crop in Bangladesh due to its diverse use and commercial value. Maize cultivation area is increasing day by day but farmers are hindering due to insects and diseases attack enormously on maize crop. Farmers are using excessive and toxic chemical pesticides to combat the pests which is alarming for human health and environmental pollution. To minimize the use of chemical pesticides IPM approach has been developed and essential to validate in the farmers field. IPM package include seed treatment with Cyantraniliprole followed foliar spray with SfNPV for insects and Oligosaccharin for diseases management. The trial has been validated in three locations namely Dinajpur, Thakurgaon, and Rangpur district. Weeds were recorded from all three locations as weeds are inoculation source of insects and diseases. Results showed that IPM package suppress the insect and diseases at tolerable level which is almost similar with farmers practice, chemical pesticide based control measure. Higher yield was obtained from Dinajpur (IPM site I) and Thakurgaon (IPM site II) district than Rangpur (IPM site III) and farmer practice plot. More number of weeds were recorded from Dinajpur district (IPM site I) than IPM site II & III. This IPM package can be suggested for the farmers but need next year validation in different locations and Kharif season as well.

Picture 42: *Field visit to the IPM packages in the farmers field by Agronomist, Entomologist, and Pathologist, A) on 28 March 2023 and B) on 14 April 2023*

PROJECT 5: AGRICULTURAL ENGINEERING

The Agricultural Engineering research at the Bangladesh Wheat and Maize Research Institute (BWMRI) is making remarkable strides. They are upgrading traditional seeding practices with a cutting-edge "Four-Wheel Tractor Operated Seeder," streamlining planting for wheat and maize. They're also perfecting the "Strip-Till Seeder" integrated with a power tiller's rotavator, enhancing soil prep and crop establishment while curbing erosion. BWMRI's focus on weed management shines with the development and assessment of efficient manual weeders customized for maize fields. Additionally, their innovative exploration mixes wheat, maize, and rice flours to craft a nutritious Vapa Pitha, catering to modern tastes while preserving tradition. These initiatives collectively underscore BWMRI's commitment to pioneering

Picture 43*: Workshop for Agricultural Engineering research and few farm Machineries*

sustainable agriculture and culinary heritage.

5.1 TILLAGE AND LAND PREPARATION

5.1.1 IMPROVEMENT OF A FOUR-WHEEL TRACTOR OPERATED SEEDER

M S B EKRAM AND M Z HOSSAIN

Abstract

A four wheel tractor drawn seeder was developed in context of combining separate attachments for wheat and maize. Fluted type seed meters are suitable for small grains like wheat, rice, rey etc. and inclined plate type seed meters are more suitable for broad grains like maize, chickpea, cowpea etc. The newly improved machine has a provision for both the types of seed boxes. It can sow maximum 8 line wheat and plant up to 3 line maize in a single run and tilling width is 160 cm. Seeding depth, seeding distances and number of seeding lines are adjustable. It's a ready to use service simplified mechanism very suitable to the end users. It enables cultivating, seeding in separate furrows and leveling the land at a single pass. The developed four wheel tractor operated seeder was tested for maize plantation during 2022-23. The average depth of seed placement was 5.1 cm. The field capacity varied in between 0.25-0.29 ha/h while operated with a forward speed of 1.8-2.1 km/h. The efficiency was found between 76-79%. There were three treatments (Tractor operated seeder, power tiller operated seeder and conventional method) replicated thrice. Significantly the highest crop yield were found in tractor operated seeder 14.17 t/ha followed by 12.6 t/ha on PTOS and 10.66 t/ha in

conventional method. The economic analysis will be done next year complying result of wheat plantation in account. The experiment will be conducted in the next year to verify the performance.

Primary fabrication of the seeder (2019-20)

Improved to save farmland at both sides (2020-21)

Improved seed meters for seeding both large and small grain seeds (2021-22)

Picture 44*: Gradual improvement of four-wheeler Tractor operated seeder*

5.1.2 IMPROVEMENT AND FINE-TUNING OF STRIP-TILL SEEDER IN EXISTING ROTAVATOR OF POWER TILLER

M Z HOSSAIN, M S B EKRAM, AKBAR HOSSAIN

Abstract

Two-wheel tractors (2WTs) or power tillers are the common means of soil tillage and other farm operations in Bangladesh due to easy access in fragmented land size with affordable prices by resource-poor farmers. This experiment demonstrates that a power tiller operated improved type strip till seeder that developed and set up an existing rotavator can enhance cereal crops establishment under strip tillage,

Chain

Sprocket

Chain + Sprocket + main wheel by Pully

Picture 45: *Adjustment of Chain and sprocket for power transmission with an existing rotavator and main wheel by Pully.*

which falls under the law of conservation agriculture (CA). All parts collection, adjustment, assembling, workshop and mechanic charges value for development and set up is very cheap (about 15000-20000Tk) whereas the Power tiller operated seeder (PTOS) cum strip till seeder is an extra part that's the market price is high (about Tk.75000). It works as shallow tiling, seeding in line, seed covering and land leveling at a time maintaining the standard agronomic practices. The newly improved machine has a provision for alternatives in both the types of seed boxes i.e., fluted type and inclined plate type seed meters box. It can sow a maximum of 4 lines of wheat and can plant up to 2 lines of maize in a single run having a tilling width of 60 cm. Seeding depth, seeding distances and number of seeding lines are adjustable. It's a ready-to-use service simplified mechanism very suitable to the end users. It improved in the Agricultural Engineering divisional workshop, BWMRI, Dinajpur for wheat and maize and its fine-tuning and field performance evaluation to be conducted in the next cropping season.

5.2 INTERCULTURAL OPERATIONS AND MANAGEMENT

5.2.1 DEVELOPMENT AND PERFORMANCE EVALUATION OF DIFFERENT TYPES OF MANUALLY OPERATED WEEDERS FOR MAIZE

M Z HOSSAIN, S B EKRAM

Abstract

Weed is the biggest problem in the crop production. Different weeds are responsible for reducing the quality and yield of crops as well as farmer's income. Manually operated different types of weeders were fabricated in Agricultural Engineering Divisional Workshop, Bangladesh Wheat and Maize Research Institute, Nashipur, Dinajpur having different shapes and sizes for weeding of maize. The blades and the depth of weeding is adjustable. Razor, hand, finger and bidha type weeders have developed from the different angel of themes. Among the fabricated weeders, razor type weeder is best according to expression of farm labors and some farmers. Fabrication is just completed and fine tuning and field performance evaluation of the weeders to be conducted next cropping season.

Picture 46: *Different types of improved manually operated weeders*

5.3 FOOD PROCESSING AND PRESERVATION

5.3.1 STUDY ON PERFORMANCE OF MIXED RATIO OF WHEAT, MAIZE, RICE FLOUR FOR VAPA PITHA MAKING PURPOSE

M Z HOSSAIN, S B EKRAM

Abstract

The present study was undertaken to develop proper ratio mixture of three major cereal crop flours, commonly consumed in Bangladesh like rice, wheat and maize flour for vapa pitha making. Further this combination is expected to give a new dimension of vapa pitha enriched with additional food value and test. In addition, this might have changed the food habit of vapa pitha lovers. The experiment was conducted in regional station, Rajshahi and head office, Bangladesh Wheat and Research Institute, Nashipur, Dinajpur. The samples were collected from local area, cleaned of foreign materials, milled and sieved. Manual procedures by making meal for getting required mixture ratio by eye estimation and sensorial testing of its softness and hardness. This experiment was conducted with six treatments, each replicated thrice. This experiment revealed the most suitable ratios of rice, maize and wheat flour for mixtures were 60:20:20 and 50:25:25 and found most acceptable. Along with each combination, suitable quantity of salt and water were added to the materials. Since in this experiment, only softness and

hardness were tested for its optimum ratio for wheat and brown maize wit rice in these seasons, cost analysis and quality and taste performance evaluation for wheat and white maize with rice to be conducted in next season.

Pictures 47*: Different combinations of rice, maize and wheat flour. Research picture of two consecutive years*

PROJECT 6: TECHNOLOGY VALIDATION AND TRANSFER
6.1. DEMONSTRATION TRIAL OF BWMRI RELEASED WHEAT VARIETIES OVER LOCATIONS

T. MAHMUD, M. BAZZAZ, M.S.N. MANDAL M.A.A. MAMUN, T. ISLAM

Abstract

One thousand seven hundred fifty-six demonstrations were conducted with 8 newly released wheat varieties viz. BARI Gom 25 (released in 2010), BARI Gom 30 (released in 2014), BARI Gom 32, BARI Gom 33 (released in 2017), BWMRI Gom 1 (released in 2019), BWMRI Gom 2, BWMRI Gom 3 (released in 2020) and BWMRI Gom 4 (released in 2022) in the farmers' fields of 50 districts out of 64 under 14 DAE regions in 2022-23. The mean yield of all the eight varieties over locations was 3.8 t ha^{-1}. A total of 1181 data were received and analyzed to analyse the result. The highest mean yield was recorded in BWMRI Gom 3 (4.2 t ha^{-1}) followed by BWMRI Gom 2 (4.0 t ha^{-1}) and BARI Gom 30 had the lowest yield (3.7 tha^{-1}). Considering region, the highest yield was obtained from Cumilla region (4.8 t ha^{-1}) followed by Khulna region (4.6 t ha^{-1}), Jashore region (4.3 t ha^{-1}) and Rajshahi region (4.2 t ha^{-1}). The yield at Mymensingh region were lowest (3.1 t ha^{-1}). The mean yield of wheat under farmers' management was 3.1 t ha^{-1} and overall mean yield of the new eight varieties was 3.8 t ha^{-1}. The difference between these two yields (yield gap) was 18.42%. So, the yield gap between demonstration in farmers' field and neighboring farmers' fields can remarkably be eliminated using good seeds of good varieties, seeding in optimum time and using recommended fertilizers, irrigations and other management practices. About 88 tons of seed preserved by demonstration farmers and 76332 farmers of the same and neighboring villages visited the demonstrations.

Picture 48: *Demonstration trials of newly developed wheat varieties at : A) Gaibandha; B) Panchagar; C) Rangamati and D) Kurigram*

6.2. DEMONSTRATION TRIAL OF BWMRI DEVELOPED HYBRID MAIZE VARIETIES WITH COMMERCIAL CHECK OVER LOCATIONS

T. ISLAM, M.A.A. MAMUN, M. BAZZAZ, M.S.N. MANDAL, T. MAHMUD

Abstract

Six hybrid maize varieties including four BWMRI released varieties and two commercials were demonstrated in top ten maize producing districts during Rabi season, 2022-23 to evaluate their yield in farmers' field. The mean yield of all the six varieties over locations was 10.1 t ha^{-1}. Considering the districts, the highest mean yield was obtained from Panchagarh (12.46 t ha-^{1}) and the lowest mean yield from Chuadanga (7.52 t ha^{-1}). The highest mean yield among the six varieties was recorded in NH 7720 (10.97 t ha^{-1}) followed by P 3355 (10.95 t ha^{-1}) and the lowest mean yield was recorded in BARI Hybrid Bhutta 17 (BARIHB 17) (9.22 t ha^{-1}). Farmers were satisfied with the yield of BWMRI Hybrid Bhutta 2 and with the kernel color of BARIHB 17.

Picture 49: *Demonstration Trial of BWMRI Developed Hybrid Maize Varieties at A) Panchagarh and B) Nilphamari*

6.3. BLOCK DEMONSTRATION OF BWMRI RELEASED HYBRID MAIZE VARIETIES IN DINAJPUR AND MEHERPUR DISTRICTS

M.A.A. MAMUN, T. ISLAM, M.M. HAQUE, J.B. AZIM

Abstract

Block demonstrations of four BWMRI hybrid maize varieties were conducted at farmers' field in Dinajpur and Meherpur during Rabi 2022-23. In Dinajpur, the highest mean yield was showed by BWMRIHB 2 (12.55 t ha^{-1}) followed by BARIHB 17 (12.17 t ha^{-1}) and the lowest mean yield was recorded in BWMRI HB 1 (9.17 t ha^{-1}). In Meherpur, the highest yield was obtained from BARIHB 17 (12.87 t ha^{-1}) followed by BWMRIHB 2 (12.62 t ha^{-1}) and the lowest yield was recorded in BWMRI HB 1 (11.98 t ha^{-1}). Farmers were satisfied with the yield of BWMRI HB 2 and BARIHB 17 and also with the kernel color of BARIHB 17.

Picture 50: *Block Demonstration of BWMRI Developed Hybrid Maize Varieties at A) Meherpur and B) Dinajpur*

6.4. DEMONSTRATION TRIAL OF BWMRI DEVELOPED KHARIF HYBRID MAIZE VARIETY WITH COMMERCIAL CHECK OVER LOCATIONS

T. ISLAM, M.A.A. MAMUN, M. BAZZAZ, M.S.N. MANDAL, T. MAHMUD

Abstract

Three hybrid maize varieties including BARIHB 17 (BARI Hybrid Bhutta 17) were demonstrated during Kharif 1 season, 2022-23 to evaluate their performance in farmers' field. The mean yield of three varieties over locations was 7.16 t ha^{-1}. The highest mean yield was found in Rangpur (7.38 t ha^{-1}) and the lowest mean yield was obtained from Dinajpur (7.03 t ha^{-1}). The highest mean yield among three varieties was recorded in Pacific 164 (7.79 t ha^{-1}) and the lowest mean yield was recorded in BARIHB 17 (6.61 t ha^{-1}). Pacific 164 showed the best performance in all locations.

Picture 51: *Demonstration Trial of BWMRI Developed Kharif Hybrid Maize Variety at A) Rangpur and B) Thakurgaon*

6.5. ON FARM DEMONSTRATION TRIAL OF HEAT TOL ERANT MAIZE HYBRIDS

M.A.A. MAMUN, T. ISLAM, J.B. AZIM, M. BAZZAZ, M.S.N. MANDAL, T. MAHMUD

Abstract

Demonstration of six heat tolerant maize hybrids including BARIHB 17 (BARI Hybrid Bhutta 17) was conducted in Dinajpur during Kharif 1, 2022-23. Among the six varieties Pacific 164 showed the highest yield (10.75 t ha^{-1}) followed by Pacific 339 (10.56 t ha^{-1}) and CAH 1511 had the lowest yield (7.15 t ha^{-1}). BARIHB 17 was recorded as early variety as it took the lowest days (112 days) to mature. Pacific 339 variety was found to be matured in maximum 121 days.

Picture 52: *On Farm Demonstration Trial of Heat Tolerant Maize Hybrids in Dinajpur*

6.6. TRAINING

Farmers and field staffs of DAE and NGOs and BWMRI officers and stuffs were trained to make them familiar with the new wheat and maize varieties, modern crop management practices, seed preservation techniques and mechanization in wheat cultivation. Training program for farmers, scientists, BWMRI field staffs and others were conducted through audio-visual aids, demonstrations, lectures, group discussions, training classes, field days, motivational tours etc.

In a total, 2651 personnel attended the training programs in different aspects during 2022-23. Out of those, 1935 farmers, 455 SAAO/SSA/SA and 261 Officers of BWMRI were trained on wheat and maize. Officers and staffs were trained on different aspects of modern office management. Trainings of farmers were imparted on new wheat and maize variety demonstration, participatory variety selection, quality wheat seed production of new wheat varieties, seed production and preservation of new wheat and maize varieties, wheat blast management and introduction of new wheat and maize varieties and modern production techniques etc.

Scientists have gone abroad for higher education, training, field days and other scientific meetings for different periods of time. which plays an important role in improving their skills in research activities. Total 25 scientists visited different states of India, Nepal, Australia, China, Mexico, Kenya and Sweden for attending different training, workshop, seminar, stakeholder meeting and higher studies during 2022-23.

Picture 53: *Officers Training on Regulations of Offial Leaves, Norms and Discipline*

Picture 54: *Officers Training on Creation and Management of Personal Ledger (PL) Account*

Picture 55: *Farmers Training on New Variety Demonstration at Gaibandha*

Picture 56: *Farmers Training on Production Technology and Pests Management of Maize at Nilphamari*

6.7. WORKSHOPS

Bangladesh Wheat and Maize Research Institute (BWMRI) organized nine seminar/workshops during 2022-23 where total participants were 518. Among these, one workshops were organized on causes of wheat blast and its management at Dinajpur, three workshop was conducted on maize fall armyworm outbreak, yield loss assessment, its nature of damage and control measures in Dinajpur and Rangpur regions of Bangladesh, one workshop was conducted on the fourth industrial revolution in agricultural research and another one workshop was conducted on Annual Research Review and Future Program Planning where scientists from different research organizations, officials (UAO, ADD, DTO, DD and AD) from Department of Agricultural Extension, Bangladesh Agricultural Development Corporation, Seed Certification Agency, Non-government Organizations, seed dealers and teachers from public universities were present.

Picture 57: *Workshop on Fall Armyworm Management on Maize in Bangladesh: An Overview*

Picture 58*: Workshop on Present status, Challenges and Prospects of Wheat and Maize in Bangladesh*

Picture 59: *Workshop on BWMRI Action Plan to Mitigate the Challenges of 4IR*

Picture 60: *Workshop on Causes and Preventive Management of Wheat Blast Disease*

Picture 61: *Workshop on Fusarium Stalk Rot Management of Maize*

Picture 62: *Workshop on Hybrid Wheat Status and Prospects in Bangladesh*

6.8. FIELD DAYS, VISITS AND PUBLICATIONS

A group of scientists, ministry people, DAE personnel, and farmers visited the demonstrations and seed production plots several times and were impressed to see the plots. A good number of visitors both from home and abroad also visited the on-station and on-farm activities of BWMRI. Twenty-four field days were organized by BWMRI about new variety demonstration, modern production technologies, quality wheat and maize seed production, wheat blast management, environment friendly control measures of Fall Armyworm insect in maize etc. where about 1990 participants were present. The participating farmers in the field days were very much interested to cultivate new varieties of wheat. Eighteen thousand five hundred folders of BWMRI Gom 2, BWMRI Gom 3, BWMRI Hybrid Bhutta 2 and BWMRI Baby Corn 1 and one booklet on BWMRI at a Glance were published and distributed among the farmers and related personnel.

Picture 63: *Field Day on BWMRI Developed Hybrid Maize Variety Demonstration at Dinajpur*

Picture 64: *Field day on Heat Tolerant Hybrid Maize Variety Demonstration*

Picture 65: *Field Day on Block Demonstration of Hybrid Maize Varieties at Dhonbari, Tangail*

Picture 66: *Field Day on Management of Maize Diseases Using Bio-Pesticide at Dinajpur*

Picture 67: *Field Day on New Varieties and Production Technologies of Wheat at Horipur, Thakurgaon*

Picture 67: *Field Day on New Varieties and Production Technologies of Wheat at Bogura*

Picture 68: *Field Day on Demonstration of Blast Resistant Wheat Varieties at Jhikorgaccha, Jashore*

Picture 69: *Field Day on New Varieties and Production Technologies of Wheat at Kishorganj*

Picture 70: *Publications of BWMRI during 2022-23*

National Integrity Award 2022-23

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