

Project Leader, Prof. Dr. Richard Trethowan and Project Investigator Dr. Rebecca Thistlethwaite and Ethiopian partner Dr. Negash Geleta visit to Pakistan in the ACIAR funded Project CROP 2020-167
“Accelerating genetic gain in wheat through hybrid breeding in Bangladesh, Ethiopia, and Pakistan”



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Organized by



Institute of Plant Breeding and Biotechnology
MNS-University of Agriculture, Multan

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Background

Wheat is a vital crop for Pakistan, providing a significant portion of the country's dietary needs as well as being an essential export commodity. However, the country faces various challenges in wheat production, including diseases, pests, and environmental stresses, which can reduce yield and quality. To address these challenges, the development of hybrid wheat seeds has emerged as a promising solution.

The Blue Aleurone (BLA) technology involves the introduction of a gene that controls the production of a blue pigment in the aleurone layer of the wheat kernel. By introducing the BLA gene into the wheat plant, breeders can produce hybrids that exhibit a blue-colored aleurone layer. This allows breeders to easily distinguish between male fertile and sterile lines during seed production.

The University of Sydney is one of the leading research institutions that have been using the BLA technology in their hybrid wheat breeding program. The university's wheat breeding program has been focusing on developing wheat varieties with improved yield, disease resistance, and nutritional quality, and the BLA technology has been an important tool in achieving these objectives. The University of Sydney have transfer the BLA technology to the wheat breeders in MNS University of Agriculture Multan through an earlier UK's Department for International Development (DFID) and KWS funded project "Hybrid Wheat for Food Security" (Sept. 2015 to Sept. 2020). Recently The Australian Centre for International Agricultural Research (ACIAR) has funded Project CROP 2020-167 titled "Accelerating genetic gain in wheat through hybrid breeding in Bangladesh, Ethiopia, and Pakistan". This project aims to develop wheat hybrids that are more resilient to climate change and have higher yield potential, thereby improving food security in these countries.

Similarly, the MNS University of Agriculture Multan has also been using the BLA technology in its hybrid wheat breeding program. The university has developed several wheat hybrids with improved yield and disease resistance using the BLA technology. For instance, the university's wheat breeding team used the BLA technology to develop various wheat hybrids with a yield increase of up to 15-20% over the OPVs. The university is also using the BLA technology to develop wheat hybrids with improved nutritional quality.

In conclusion, the BLA technology has been an important tool in hybrid wheat breeding programs at both the University of Sydney and the MNS University of Agriculture Multan. The

technology has enabled breeders to develop wheat hybrids with improved yield, disease resistance, and nutritional quality. With ongoing research and development in this field, the BLA technology is expected to continue playing a critical role in developing new and improved hybrid wheat varieties that can help meet the growing demand for food worldwide.

Hybrid wheat is a cross between two different wheat varieties, resulting in offspring with superior traits, such as increased yield, improved disease resistance, and tolerance to environmental stresses. These hybrids are produced by carefully controlling the pollination process, which results in a more genetically diverse and resilient crop.

A foreign delegate Prof. Dr. Richard Trethowan, Dr. Rebecca Thistlethwaite and Dr. Negash Geleta visited the MNS University of Agriculture Multan. They have visited different agriculture research farms like Rana Siraj Iqbal farm Luddan, LCI farm Multan, Pirowal farm of Fatima Group etc.

To raise awareness and promote the use of hybrid wheat seeds, MNS University of Agriculture, Multan has organized the "Wheat Farmer Day" in collaboration with Fatima Fertilizer Company Limited. This event has brought together farmers, researchers, and industry experts to share knowledge and best practices related to hybrid wheat seed development, production, and utilization.

The "Wheat Farmer Day" has included informative sessions on the benefits of hybrid wheat seeds, technical aspects of seed production, and practical demonstrations of seed sowing and harvesting techniques. Participants got opportunity to network with industry experts and fellow farmers to exchange ideas and experiences.

The objectives of the foreign delegate to visit the Pakistan

Project Leader, Prof. Dr. Richard Trethowan and Project Investigator Dr. Rebecca Thistlethwaite and Ethiopian partner Dr. Negash Geleta in the ACIAR funded Project CROP 2020-167 titled "Accelerating genetic gain in wheat through hybrid breeding in Bangladesh, Ethiopia, and Pakistan" visited the Pakistan. This project focuses on developing hybrid wheat varieties that have improved yield potential, resistance to diseases and pests, and tolerance to abiotic stresses such as heat and drought. The wheat hybrids are in field trials across multiple locations in each country, to evaluate their performance under different environmental conditions. The project is also involve the development of a seed production and distribution system, to ensure that farmers have access to the new hybrid varieties. This

involves collaboration with local seed companies and farmer organizations, as well as government agencies responsible for regulating seed production and distribution.

Overall objectives of the visit were:

1. Evaluate experimental hybrids: The MNS University of Agriculture Multan is testing different hybrids. By visiting the trials, the partners breeders can observe the performance of these hybrids in different environmental conditions and gain insights into their potential for use in breeding programs.
2. Exchange knowledge and expertise: The hybrid wheat breeders visited the MNSUAM to exchange knowledge and expertise on different aspects of wheat breeding, such as breeding techniques, seed production, disease resistance, and agronomy practices. This can help partner organizations to learn from each other's experiences and develop new insights that can improve their respective breeding programs. The foreign team also participated in the Hybrid wheat farmers convention.
3. To facilitate technology transfer: To see the performance of various F1 hybrids and different females in the field and to provide guidelines for purifying and enhance the seed production of females lines.
4. To visit F1 Hybrid seed production at large scale: The visitors have gone through different private partners agriculture farms where they have observed the F1 hybrid seed production of wheat.

Executive Summary

In order to transform wheat seed sector in Pakistan, there is a need to formulating sustainable policies/regulations and their implementation, and capacity building and knowledge sharing especially with the collaboration of scientists of developed world.

A group foreign delegates comprising of Prof. Dr. Richard Trethowan, Dr. Rebecca Thistlethwaite (both from University of Sydney, Australia) and Dr. Negash Geleta (Senior researcher at Ethiopian institute of Agricultural Research, Kulumsa Agricultural Research Center, Asella, Ethiopia) visited Pakistan in the ACIAR funded Project. During their visited the delegate visited various Hybrid Wheat field trial conducted at MSNUAM and at several other locations being managed by private sector like Luddon form, LCI form and Fatima Fertilizer Group. The F₁ seed production fields were visited, the local experts and scientist were involved in discussion with members of the foreign delegates regarding the use of BLA technology, potential of hybrid wheat seed and its implication for the betterment of the farming community. Prof. Richard shared his valuable and experienced comments and appreciated the interest, steps taken and success of private industry partners in development hybrid wheat.

The Wheat Farmer Day was organized by MNS University of Agriculture, Multan on 21st February, 2023 to provide a forum to all stakeholders for sharing their expertise, experiences, learnings, and developing working collaboration to ensure local hybrid seed production for catering the domestic requirements.

Wheat Scientists from Australia, Pakistan, leadership of multinational and national seed companies, officials from public sector research organizations, and faculty and students of various universities participated in this event.

Honorable Mr. Syed Fakhar Imam, Ex-Federal Minister for National Food Security and Research was the Chief Guest. Secretary Agriculture Department Punjab, Dr. Abid Mahmood, Chairman Punjab Agriculture Research Board, Dr. Javed Ahmad, Chief Scientist, Wheat Research Institute, AARI, Faisalabad, Prof. Dr. Richard Trethowan, Plant Breeding Institute, University of Sydney, Australia, Prof. Dr. Muhammad Ashfaq, Director Institute of Plant Protection, MNSUAM and Mr. Naseer Ullah Khan, Manager, Technical Services, Fatima Group shared their experiences regarding hybrid seed related activities in Australia and need for the same in agriculture sustainability in Pakistan was discussed. The event aimed to provide

information and educate wheat farmers on various topics related to wheat farming. The main focus of the event was on hybrid seed development, wheat production technology, wheat rusts management, and the future of wheat hybrids in Pakistan.

The event also included presentations and talks from other experts in the field of wheat farming. They shared their knowledge and experience with farmers, discussing various topics related to wheat farming. They highlighted the importance of hybrid seed development and its benefits for wheat farmers. The experts also talked about the latest production technologies that could help farmers increase their yields and improve the quality of their crops.

The event also covered the topic of wheat rusts management, which is a critical issue for wheat farmers. The experts discussed the different types of rusts and their impact on wheat crops, as well as strategies to manage and control rusts.

Finally, the experts discussed the future of wheat hybrids in Pakistan. They emphasized the need for continuous research and development to improve the quality and yield of wheat crops. They also discussed the potential benefits of adopting hybrid varieties for farmers.

Overall, the Wheat Farmer Day provided an opportunity for wheat farmers to learn from experts in the field and gain valuable insights on various topics related to wheat farming.

Recommendations

1. To resolve the issue of synchronization of pollination between male and female, it was recommended by the foreign delegate that at least sow one strip of the male 3-4 days earlier than the female. Whereas second strip of male should be sown same date with the female.
2. The uniformity issue in the female can be minimize with the reselection in the females lines and keep this practice after every two years.
3. Pakistan locally produced wheat varieties should be converted to female lines for getting the better resistance to climate adversities.
4. Blending ratio method should also be practiced for hybrid seed production, as this method is more feasible for commercial scale hybrid seed production especially with respective to private industry.
5. Increase investment in research and development: Research and development are essential for the development of new and improved hybrid wheat varieties. More investment in this area will lead to the development of better hybrid seeds, which can help increase productivity and yield.
6. Encourage private sector participation: In many countries, the private sector has been slow to enter the hybrid wheat market due to the high cost of research and development. Governments can encourage private sector participation by providing incentives such as tax breaks, grants, and subsidies.
7. Develop seed production infrastructure: The success of hybrid seed production depends on the availability of suitable seed production infrastructure. Governments and private companies need to invest in seed production infrastructure, including seed processing and storage facilities.
8. Improve farmer awareness and education: Many farmers are not aware of the benefits of using hybrid seeds. Governments and private companies can invest in awareness campaigns to educate farmers about the benefits of hybrid seeds, including increased yields and improved crop resilience.
9. Promote seed quality and certification: To ensure the availability of high-quality hybrid seeds, governments and private companies should promote seed certification and

quality control measures. This will help ensure that farmers have access to high-quality seeds that will produce consistent yields.

10. Develop hybrid seeds that are adapted to local conditions: Hybrid seeds need to be developed that are adapted to local growing conditions, including soil type, climate, and disease resistance. Governments and private companies should invest in research to develop hybrid seeds that are suited to local conditions.

11. Encourage international cooperation: International cooperation can help facilitate the exchange of knowledge and resources needed for the development of hybrid seeds. Governments, research institutions, and private companies should work together to promote international cooperation in the development of hybrid wheat varieties.

These recommendations, if implemented, can help to improve the development and adoption of hybrid seed in wheat and increase agricultural productivity.

Activity Plan

Activity	Timing
Field Visits	
Day 1 (February 20, 2023)	
Visit to Rana Siraj Iqbal Farm, Ludden, Mailsi	10:00 am – 01:00 pm
Visit to LCI Research and Development, Pakistan	02:00 am – 01:00 pm
Hybrid Wheat Farmer Convention	
Day 2 (February 21, 2023)	
Field visits of hybrid wheat trials at MNSUAM	10:30 am-10:50 am
Welcome and introduction of hybrid wheat by Prof. Dr. Asif Ali (T.I), Vice Chancellor, MNSUAM.	11:00 am-11:15 am
Talk by Prof. Dr. Richard Trethowan, Plant Breeding Institute, University of Sydney, Australia.	11:15 am-11:35 am
Wheat Production Technology by Dr. Javed Ahmad, Chief Scientist, Wheat Research, AARI, Faisalabad	11:35 am-11:55 am
Wheat rusts management strategies by Prof. Dr. Muhammad Ashfaq, Director Institute of Plant Protection, MNSUAM	11:55 am – 12:15 pm
Future of wheat hybrids by Mr. Naseer Ullah Khan, Manager, Technical Services, Fatima Group	12:15 pm-12:30 pm
License agreement signing	12:30 pm- 12:40 pm
Concluding remarks by the guest of honor	12:40 pm- 12:50 pm
Souvenir distribution followed by Lunch	12:50 – 01:30 p.m.
Field Visits	
Day 3 (February 22, 2023)	
Visit to Fatima Group farms Pirowal, Khanewal	10:00 am – 01:00 pm

Visit to Rana Siraj Iqbal Farm, Luddan, Mailsi

On February 20, a foreign delegate Prof. Dr. Richard Trethowan, Dr. Rebecca Thistlethwaite and Dr. Negash Geleta accompanied by officials Prof. Dr. Irfan Ahmad Baig, Prof. Dr. Shafqat Saeed, Prof. Dr. Hammad Nadeem Tahir, Prof. Dr. Muhammad Ashfaq, Dr. Hafiz Mokhum Hammad, Dr. M. Abu Bakar Saddique and Dr. Muhammad Ali Sher visited a hybrid wheat field of Mr. Rana Iqbal Siraj in Luddan Tehsil Mailsi. The purpose of the visit was to observe the progress of the production of different hybrid wheat on large scale and learn about the seed production methods (strip and different blended ratio) being employed by the research team.



During the visit, the research team provided a detailed explanation of the seed production techniques being employed and the characteristics of the different hybrid populations.



The foreign delegate and university officials were able to observe the different stages of the seed production, from the selection of parent lines especially the height of the male parent used in the hybrid seed production in the field. The research team also discussed the challenges they faced in developing hybrid wheat, including the need to develop hybrids that are more resilient to climate change, have high yield potential, and are resistant to diseases and pests. The team explained that the breeding program was focused on developing hybrid wheat varieties that were adapted to the local agro-climatic conditions, with the aim of improving food security in the region. The foreign delegate and university officials were impressed by the progress of the hybrid wheat breeding program and the expertise of the research team. They expressed

their appreciation for the opportunity to observe the program firsthand and learn about the various blended techniques being employed

Visit to LCI/ICI Research and Development, Pakistan

On 20-21 February 2023, a foreign delegate Prof. Dr. Richard Trethowan, Dr. Rebecca Thistlethwaite and Dr. Negash Geleta accompanied by officials Prof. Dr. Asif Ali (Vice Chancellor, MNSUAM), Prof. Dr. Irfan Ahmad Baig, Prof. Dr. Hammad Nadeem Tahir, Dr. M. Abu Bakar Saddique and Dr. Muhammad Ali Sher visited the LCI private industry partner's site to observe the performance of hybrid wheat trials. The aim of the visit was to evaluate the

performance of the different hybrid wheat seed production by the private industry partner and to explore potential collaborations in hybrid wheat breeding.



Upon arrival, the research team (Mr. Muhammad Zulqarnain Hader and Mr. Hamza Bhutta and others) at the private industry partner's site greeted the group. The team provided a detailed explanation of the various seed production techniques being used to develop hybrid wheat and the characteristics of the different varieties being evaluated in the trials. Manager Research and Development, Mr. Muhammad Zulqarnain Haider briefed about the ongoing research activities at the farm. He told that LCI has got rights of five wheat hybrids developed by the MNS University of Agriculture Multan. Later on, he showed that F_1 hybrid performance testing field, F_1 seed production blocks. He briefed about the hybrid wheat seed production research experiments. Problems of seed setting, planting time of male and female lines, ratio of male and female lines, mixed sowing of male seed with female seed was discussed. Furthermore, he also briefs that hybrid seed production through blending method is more feasible for commercial scale seed production. Dr. Richard discusses with them how they can improve the

purity of the seed especially in the field through roughing. Few days ago, a heavy hailstorm was observed in the area but still hybrids were not showing lodging and some hybrids were showing high resistance for disease tolerance.

Field visits of hybrid wheat trials at MNSUAM

The Government officials, Syed Fakhar Imam (Ex- federal minister for National Food Security & Research), Dr. Abid Mehmod (Chief Executive, Punjab Agriculture Research Board), Muhammad Nawaz Khan Chief Scientist Agri. (Research) Ayub Agricultural Research Institute, Faisalabad, Mr. Naseerullah Khan, FEM, and Imran Hameed and others from Fatima AG Solutions Limited, Mr. Khalid Khokhar President Kisan Itehad, farmers, Prof. Dr. Richard Trethowan, Dr. Rebecca Thistlethwaite and Dr. Negash Geleta along with the university officials Prof. Asif Ali (Vic chancellor), Prof. Dr. Irfan Ahmad Baig, Prof. Dr. Shafqat Saeed, Prof.

Dr. Hammad Nadeem Tahir, Prof. Dr. Muhammad Ashfaq, Dr. Hafiz Mokhum Hammad, Dr. M. Abu Bakar Saddique and Dr. Muhammad Ali Sher visited the hybrid wheat trials being conducted at MNSUAM. At university, 500 locally produced



and 103 hybrids received from Australia were being evaluated for their performance.

The purpose of their visit was to observe the progress of the trials and provide their expert opinions on the results. The trials were being conducted by the researchers at MNSUAM to develop hybrid wheat that are resistant to biotic and abiotic stresses, have high yield potential, and are well-suited for the local agro-climatic conditions. During the visit, the persons observed the different stages of the hybrid wheat trials. Some hybrids were early maturing some were late maturing. They also interacted with the researchers and field technicians to gather more information about the trials and the methodologies being used. The team also visited the color sorter machine at C-block of MNSUAM that us being used to separate the maintainer line (blue) and sterile line (white) seed. Furthermore, they also observe the

performance of 05 BLA lines which were received from Australia. Prof. Richard and Prof. Asif Ali appreciated the efforts being made by the researchers and the potential of the hybrid wheat varieties being developed. They also provided valuable feedback on the experimental design, data analysis, and future research directions. Overall, the field visits of the hybrid wheat trials at MNSUAM were a productive and informative experience for all involved, and are expected to contribute significantly to the development of high-yielding, stress-resistant hybrid wheat varieties that can improve food security and livelihoods in the region.

Hybrid Wheat Farmer Convention

Seminar Title:

Hybrid Wheat Seeds, Agreement Signing Ceremony, between MNSUAM and Fatima AG Solutions Fertilizers Company jointly organized by MSNUAM and Fatima Fertilizers.

Speakers / Guests:

1. Prof. Dr. Asif Ali (Vice Chancellor, MNSUAM)
2. Prof. Dr. Richard Trethowan (University of Sydney, Australia)
3. Mr. Syed Fakhar Imam (Former Federal Minister for National Food, Security and Research)
4. Mr. Imtiaz Ahmad Warriach (Additional Secretary Task Force South Punjab, Multan)
5. Dr. Dr. Muhammad Ashfaq (Director IPP, MNSUAM)
6. Dr. Abid Mehmood (Chief Executive, Punjab Agriculture Research Board)
7. Mr. Muhammad Nawaz Maikan (Chief Scientist, AARI, Faisalabad)
8. Mr. Naseerullah Khan (Representative of Fatima Fertilizers)
9. Mr. Khalid Khokhar (President Kisan Itehad)

The program was started with the recitation of a few verses from the holy qur'an by Mr. Hasnain and the Na'at by Mr. Mohsin Raza.

1. Prof. Dr. Asif Ali, Vice Chancellor, MSNUAM

Welcomed to overseas scientists from Australian, Ethiopia, guests from Fatima AG Solutions, Additional Secretary South Punjab, Imtiaz Ahmad Warriach. Prof. Asaf Ali acknowledged the

efforts of Norman E. Borlaug whose achievements revolutionized wheat production and yield. He further added that unlike maize, given the fact wheat is self-pollinated crop, development of hybrid(s) has been very challenging and a tedious activity thus the idea of the development of wheat hybrids was

conceived and imitated by MNSUAM wheat scientists and project was submitted.

He also acknowledged that the efforts, and the contribution of Australian and



Pakistani scientists deserve great appreciation. So far, 100 hybrids have been screened and the best 5 have been selected for commercialization. These 5 selected are higher yielder and showing resistance to rust has a great production and yield potential. The Vice Chancellor gladly announced the signing of a memorandum of understanding (MoU) between MNSUAM and Fatima AG Solutions for the commercialization of the said 5 hybrids. The chair concluded with an emphasis on that this research has been funded by a public money so we aim at to distribute and provide the hybrid seed to every farmer at the same rate and same quality so that every farmer equally shares the benefits.

2. Prof. Richard Trethowan – University of Sydney, Australia Breaking the yield barrier: The potential of hybrid wheat

Prof. Trethowan thanked for the invitation and called the hybrid success story as a team effort of all the involved scientists. Wheat is major crop with annual production of 20-25 million tons which is valued at \$9.9 billion in 2020-21. Wheat is a staple crop in Pakistan, with over 80% of the country's population consuming it as a primary food source. It's a vital crop for the country's

economy, contributing to employment, export earnings, and food security. However, the yield potential of wheat has remained stagnant in



Pakistan for the past few decades, and this has led to the country being heavily dependent on imports to meet its growing demand.

One solution to this problem is the use of hybrid wheat seed. Hybrid wheat seed is created by crossing two genetically different parent plants to produce a hybrid offspring with improved traits such as higher yield potential, better disease resistance, and improved grain quality. Colored-grain wheat is regarded as an ideal food for human health and has attracted increasing interest from both food manufacturers and researchers. Unlike purple-grained wheat, which stores anthocyanins in the seed coat, blue-grained wheat shows anthocyanin accumulation in the aleurone layer. This technology has been successfully used in other parts of the world, such as in Australia, where hybrid wheat has increased yields by up to 30%.

The use of hybrid wheat seed in Pakistan can offer several benefits, including:

1. **Higher Yields:** Hybrid wheat has the potential to produce higher yields than traditional wheat varieties. This means that farmers can grow more wheat on the same amount of land, which can increase their income and food security.
2. **Better Disease Resistance:** Hybrid wheat is more resistant to diseases such as rust, which can significantly reduce crop yields. This means that farmers can reduce the use of pesticides and herbicides, which can be expensive and harmful to the environment.
3. **Improved Grain Quality:** Hybrid wheat can have better grain quality traits such as higher protein content, better milling properties, and improved baking quality. This can lead to higher prices for farmers, which can again increase their income.

However, there are some challenges associated with the use of hybrid wheat seed. One of the main challenges is the cost of the seed, which can be higher than traditional wheat seed. This can be a barrier for small-scale farmers who may not be able to afford the cost of the seed.

Another challenge is the lack of awareness and understanding of hybrid wheat technology among farmers. Many farmers may be hesitant to adopt this new technology, as it requires a different set of management practices than traditional wheat varieties.

In conclusion, the use of hybrid wheat seed has the potential to significantly increase wheat yields in Pakistan and improve the quality of the crop. However, it is important to ensure that small-scale farmers have access to the technology and are aware of the benefits it can offer. Government policies and programs can play an important role in promoting the adoption of hybrid wheat technology and supporting farmers in its use.

Hybrid wheat is a cross between inbred lines resulting into increase in vigor. Hybrid production had been a bottle neck in self-pollinated crop. Various systems like Cytoplasmic male sterility, Chemicals, Temperature induce sterility, Transgenic system have been used for hybrid production.

3. Prof. Dr. M. Ashfaq

Prof. Dr. M. Ashfaq explained the rust losses and its management in wheat. Rust is critical issue in wheat and has been report in Raheem Yar Khan, Pakistan in 2023. There are different types of rust, stem rust (leaf or stem), Leaf (Brown color), Stripe (yellow color). Several alternate host for rust like Berberis, Mahonia, Orchid grass, Blue grass. Different environmental factors such as moisture and temperature play a critical role in the development of rust diseases. For rust should be managed by early sowing in November, by use of potash and by use of protective spray (like Tebuconazole 200ml/acre, Difenoconazole + Azoxystrobin 200ml/acre and Tebuconazole+Trifloxistrobin 65g/acre).



4. Mr. Naseerullah Khan

His discussion mainly emphasized on “How to increase per acre grain yield production and how is it a key step in development of the economy of Pakistan”. He focused on two main strategies such as utilization of certified seed and well irrigated lands. He appreciated that Mr. Syed Faker-e-Imam, Former Federal Minister has promised to ensure the availability of certified seed from Ayub Agriculture Research Institute (AARI) Faisalabad. In 2021-22, the export and import rate in Pakistan were 33.76 billion and 80.22 billion respectively. Hybrid wheat has enhanced grain yield production in developed countries from 30 to 40 million ton from 18.5 million acre of land. Whereas, in under developed countries, maximum grain yield production (from native wheat genotypes) is still in between 20 to 25 million ton from 23.5 million acre of land, highlighting a considerable difference among them. Similarly for cotton, its productivity has



also decreased in previous years. Both of these crops have major contribution towards GDP of Pakistan, agriculture sustainability and food security.

5. Mr. Khalid Khokhar

He explicitly put forward the list of actual issues/challenges farmers community is facing since several decades. He blamed seeds and fertilizer mafia for looting farmers and sucking blood out of their veins. He emphasized that country could progress only if farmer progresses so policy makers and research institutes must ensure the availability of subsidized and certified seeds and other agro-chemicals. To him, every farmer can harvest maximum benefits and take over 50 mounds/acre if he also provides all fertilizers and needs on time. He was found very disappointed on the performance of agri. Extension department whose main role is provision of facilitation and guidance to the farming community. He concluded on the statement that “Food security issue are on the top as compared to boarder security issue throughout the world”.



6. Mr. M. Nawaz Maikan

Chief Scientist, AARI congratulated the organizers of this event for bringing together key stakeholders in the agriculture sector to sign this important agreement. Hybrid wheat has the potential to revolutionize agriculture in Pakistan, as it promises higher yields, greater resistance to diseases and pests, and improved tolerance to adverse weather conditions.

According to him it is heartening to see that the public and private sectors have come together to collaborate on this project. Such partnerships are crucial to promoting



innovation and driving economic growth in the country. The agreement signing ceremony is a testament to the commitment of both sectors to work together towards achieving this goal. He believes that the successful development and commercialization of hybrid wheat will require a concerted effort from all stakeholders, including farmers, researchers, policymakers, and industry experts. We must work together to ensure that the technology is accessible and affordable to small farmers and that it is sustainable in the long term.

In conclusion, Mr. Maikan was optimistic about the potential of hybrid wheat to transform agriculture in Pakistan, and looking forward to seeing the positive impact it will have on the country's food security and economic development.

7. Dr. Abid Mehmood

While expressing his views Dr. Abid Mehmood CEO PARB also endorsed that increase in per acre yield is the only solution to get ride of food insecurity and shortages. He further added that PARB is striving to facilitate researchers across the province to make this happened. He congratulated all the scientists involved in developing and launching first wheat hybrids in Pakistan.



8. Mr. Syed Fakhar Imam (Former Federal Minister for National Food, Security and Research)

Appreciated the successful holding such a fabulous platform for scientists, researchers, farmers and students. He also acknowledged and thanked overseas scientists for their visit and contributions in developing wheat hybrids. He shared the situation of wheat production and yield for the last whole century and the famines in the Asia. He also reiterated that per acre yield increase is the only solution to increase wheat yield and hybrid wheat will surely help achieve this goal.

Government authorities and policy makers must consider the real facts and circumstance of the farming community while make decision. Such authorities must ensure the availability of certified seeds, subsidized inputs and latest farming machineries. Contemporarily, the research institutes also focus on the development and promotion of new seed technologies as well as the accessible mechanisms for their testing.



Visit to Fatima Group Pirowal, Khanewal

Prof. Dr. Richard Trethowan, Dr. Rebecca Thistlethwaite and Dr. Negash Geleta accompanied by Prof. Dr. Irfan Ahmad Baig, Dr. M. Abu Bakar Saddique and Dr. Muhammad Ali Sher, visited the Fatima Group in Pirowal, Khanewal on February 22, 2023. The objective of the visit was to observe the ongoing research and development activities concerning the production of hybrid wheat seeds. The group was then taken on a tour of the trial plots where they were able to observe the performance of different F₁ wheat hybrids which were producing during 2021-2022. Furthermore, the researchers demonstrated the different growth stages of the wheat crop. The group was also



able to observe the different phenotypic traits of the hybrid wheat being evaluated, such as height, uniformity, synchronization of anthesis among different male and females etc. Mr. Imran Hameed Fatima group representative brief that during 2022-23 they are producing 05 F₁ hybrids on 4.5. During 2023-24, these hybrid seeds will be planted and evaluated at different farmers' field to bring the awareness and importance of the wheat hybrid seed. He also explained that Fatima Group farms were conducting wheat F1 seed production trials with utmost care and attention to detail, adhering to standard protocols for trial design, seed treatment, sowing, fertilizer application, irrigation, weed control, and disease and pest management practices.

Prof. Richard's visit provided an opportunity to share ideas and knowledge about wheat seed production, which would ultimately benefit Pakistan's agriculture industry. The group was able to ask questions and engage in discussions with the researchers about the performance of the hybrid wheat and the potential for future collaborations. Likewise, Luddan farm, Prof. Dr. Richard was told about the issue of the uniformity and appearance of sterile female seed

in the F1 evaluation plot. Dr. Richard advised to reselect the female seed at least after every two year and do practice of rouging in the male also. Overall, the visit was a success, and the group was impressed by the performance of the hybrid wheat varieties developed by the private industry partner.

Conclusion:

The visit of hybrid wheat breeders to our fields was a productive and informative experience for both the delegation and our organization. The insights gained from the visit will be invaluable in guiding our future research and development efforts. We look forward to continued collaboration with experts from around the world to advance the field of hybrid wheat breeding and improve global food security

Media Coverage



