

REPORT

of

One day workshop on

Integrated Weed Management for Sustainable Wheat Production

February 26, 2019



Organized by

Department of Agronomy

MNS-UNIVERSITY OF AGRICULTURE, MULTAN

2019

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EXECUTIVE SUMMARY

Keeping in view the economic and ecological significance of weeds in wheat crop, Department of Agronomy, MNS-UAM, organized a one day workshop “**Integrated Weed Management for Sustainable Wheat Production**” on February 26, 2018 (Wednesday). The event covered informative presentations/lectures by subject experts followed by interactive discussion, Q&A session on said topic, and a field demonstration. The workshop provided a platform to institutions, researchers, faculties, young scientists, farmers and others stakeholders to promote linkages and discuss future opportunities for joint research and knowledge exchange. There were intensive interactions and learning experiences for the participants. About 150 participants were trained about innovative weed management practices with special reference to sustainable wheat production in a changing climate. Various aspects of weed management like weed related issues in cotton-wheat cropping system, non-chemical weed management, need and action plan for integrated weed management, herbicide resistance and its detection, improved production technology and control of invasive weeds like parthenium were discussed. The participants also visited Experimental Farm of MNS-UAM and witnessed innovative weed management practices and satisfactory weed control leading to healthy crop stands.



Workshop Program

Time	Activity/Presentation	Resource Person
9:30 am	Registration and Seating of Guests	-
10:00 am	Qiraat and Naat	-
10:10 am	Welcome Address	Prof. Dr. Asif Ali Vice Chancellor, MNSUAM
10:20 am	Farmers Weed Related Apprehensions in the Cotton-Wheat Cropping System and the Way Out	Dr. Nazim Hussain Labar Professor, Department of Agronomy, BZU
10:40 am	The Need of Integrated Weed Management In Wheat	Dr. Amar Matloob Assistant Professor, Agronomy, MNS-UAM
11:00 am	Herbicide(s) Usage in Wheat Production: Key Points and Cautions	Mr. Muhammad Ashiq Assistant Agronomist, Plant Physiology Section, AARI
11:20 am	RISQ (Resistance In-Season Quick) Test for Detecting Grassy Weeds Resistance to Herbicides in Wheat	Prof. Dr. Shafqat Saeed Dean, FAES, MNS-UAM
11:40 am	Improved Production Technology of Wheat in the Backdrop of a Changing Climate	Dr. Abdul Ghaffar Associate Professor, Agronomy, MNS-UAM
12: 00 pm	Parthenium Weed Eradication: MNS-UAM Initiatives and Success Story	Dr. Khuram Mubeen Assistant Professor, Agronomy, MNS-UAM
12:20 pm	Question Answer Session	Expert Panel
12:40 pm	Vote of Thanks	Dr. Abdul Ghaffar Associate Professor, Agronomy, MNS-UAM
12:45 pm	Field Visit	Mr. Mahmood Alam Farm Manger, MNS-UAM

پروگرام بروز منگل مورخہ 26 فروری، 2019

وقت	سرگرمی / موضوع	متعلقہ شخصیت
9:30 AM	مہمانوں کی تشریف آوری	-
10:00 AM	تلاوت کلام پاک اور نعت رسول مقبول ﷺ	-
10:10 AM	خطبہ استقبالیہ	پروفیسر ڈاکٹر آصف علی رئیس جامعہ زرعیہ، ملتان
10:20 AM	کپاس اور گندم پر مشتمل فصلاتی نظام میں جڑی بوٹیوں سے متعلقہ مسائل اور ممکنہ حل	پروفیسر ڈاکٹر ناظم حسین لاہر شعبہ فلاح، بہاول الدین زکریا یونیورسٹی، ملتان
10:40 AM	گندم میں جڑی بوٹیوں کے مربوط طریقہ انسداد کی اہمیت	ڈاکٹر عمار مطلوب شعبہ فلاح، جامعہ زرعیہ، ملتان
11:00 AM	جڑی بوٹی مارزہروں کا موثر استعمال: اہم نکات اور سفارشات	محمد عاشق اسٹنٹ اگرا نومیٹ، شعبہ فعالیت فضلات: ایوب زرعی تحقیقاتی ادارہ فیصل آباد
11:20 AM	گندم کی گھاس نما جڑی بوٹیوں میں جڑی بوٹی مارزہروں کے خلاف مدافعت کی نشاندہی کے لیے جلد تجزیہ	پروفیسر ڈاکٹر شفقت سعید رئیس کلیہ زراعت جامعہ زرعیہ، ملتان
11:40 AM	بدلتے موسمی حالات کے تناظر میں گندم کی بہتر پیداوار کے حصول کا عملی منصوبہ	ڈاکٹر عبد الغفار شعبہ فلاح، جامعہ زرعیہ، ملتان
12:00 AM	گاجر بوٹی کا تدارک: جامعہ کے زیرِ تفتیش کیے جانے والے اقدامات اور کامیابیاں	ڈاکٹر خرم مبین شعبہ فلاح، جامعہ زرعیہ، ملتان
12:20 AM	نشست برائے سوال و جواب	-
12:30 AM	مہمان خصوصی کا خطاب	-
12:40 AM	اظہار تشکر	ڈاکٹر عبد الغفار شعبہ فلاح، جامعہ زرعیہ، ملتان
12:45 AM	جامعہ کے تحقیقاتی فارم کا دورہ	محمود عالم اور دیگر اراکین فارم ٹینیجر، جامعہ زرعیہ، ملتان

Training workshop started with the recitation of few verses from Holy Quran and Naat Rasool Maqbool. Dr. Ghulam Haider, Assistant Professor, Department of Agronomy served as stage secretary for the training workshop.

Welcome Address

Prof. Dr. Shafqat Saeed, Dean, Faculty of Agriculture and Environmental Sciences warmly welcomed the honorable guests, participants from South Punjab Agriculture Forum, students and farming community of the region. He thanked farmers in particular for getting out the time from their busy schedule to attend this workshop. He also thanked the organizing team for arranging this much needed and timely event. He said that such event will continue in near future as well.

range of agro-climatic conditions. Weeds act differently in different habitats and provide shelter to the insects and diseases causing pests, resultantly lowering the quality of produce. He talked about weed problems in this particular rotation with emphasis on difficult to control weeds. He discussed the 10 most troublesome weeds of wheat and cotton. He added that weeds are serious concern to the productivity and profitability of this system and tremendous scope exists to abridge existing yield gap owing to weed infestation. Productivity and sustainability of this production system relies on the success of weed management practices and farmer's awareness is the key for long term success of weed management program.



Speaker 1: **Prof. Dr. Nazim Hussain Labar (Department of Agronomy, BZU)**

Topic: **Farmer's Weed Related Apprehensions in the Cotton-Wheat Cropping System and the Way Out**

Dr. Nazim Hussain highlighted the farmer's weed related apprehensions in the cotton-wheat cropping system and the way out. Talking on the occasion, he said that weeds are the plants with specific features helping them to infest and invade in the crops and to succeed under a wide



Speaker 2: Dr. Amar Matloob
(Department of Agronomy, MNS-UAM)

Topic: The Need of Integrated Weed Management in Wheat

Dr. Matloob discussed need of integrated weed management (IWM) practices in wheat. Due to diverse agro-climatic conditions of Pakistan, 267 weed species have been identified that cause monetary loss worth 3 billion US\$ annually. Out of these, approximately 160 have been reported as weeds in Punjab; of which 50 are serious weeds causing major economic losses in major field crops. He pointed out that weed problem causes enormous yield losses in field crops. In just wheat crop, weed related yield losses exceed 100 billion PKR. The 100% crop failure is possible due to weeds and pest attack, and weeds reduces wheat yield to the tune of 15-42%. He also discussed prospects and practical approaches to overcome weed threat in agro-ecosystems. He suggested farmers that crop yields can be increased by adopting efficient IWM practices. He elaborated the need and concept of IWM and model IWM plan for wheat crop. He said that land preparation, suicidal germination, seeding time, method, density, fertilizer application rates and timing, crop rotation, row orientation and spacing, crop residue management can be judiciously exploited to combat weed menace in wheat crop.

Topic: Herbicide(s) Usage in Wheat Production: Key Points and Cautions

In his second talk, Dr. Amar Matloob laminated that haphazard and indiscriminate herbicide usage has caused evolution of herbicide resistant weed biotypes in canary grass. He showed videos demonstrating erroneous spraying techniques. He said that

herbicides should not be considered as sole mean of weed control and these should be used in integration with non-chemical methods of weed control. Although use of herbicides is easy, save time, labor and money; yet environmental cost associated with falsified herbicide applications are substantial. Farmers do not perceive the extent of weed related problems until things go from bad to worse. The herbicide related constraints in Pakistan include:

- Inadequate knowledge of herbicide selection under a given set of agro-ecological conditions
- Neglecting the previous field history and target weed flora
- Poor timing of application
- Use of wrong nozzle
- Under or over dose of product resulting either in poor weed control or toxicity to the main crop
- Tank mixing incompatible products
- Spraying using less/unfit water as a carrier
- Spraying without calibration
- Repeated use of herbicide/s with same mode of action



Speaker 3: **Prof. Dr. Shafqat Saeed**
(Dean, FAES, MNS-UAM)

Topic: **RISQ (Resistance In-Season Quick) Test for Detecting Grassy Weeds Resistance to Herbicides in Wheat**

Dr. Shafqat said that the Syngenta RISQ Test is a bioassay that is used to detect field resistance early in the season. In this test, seedlings are transplanted into agar mixed with different rates of herbicides and results are obtained in 10-14 DAT (for *Phalaris minor* 10-12 DAT). It is suitable for all major weed genera & all herbicide modes of action. He said that objectives were to appraise the *Phalaris* resistance against herbicides, i.e. penoxaden and sulfosulfuron in lab and to communicate the results to the respective farmers within 14 days to manage *Phalaris* in same field according to recommendations. The study covered 24, 15 and 15 biotypes of canary grass collected from Multan, D.G. Khan and Bhakkar, respectively. Of these, 12, 9 and 7 biotypes showed less than 60% mortality in penoxaden bioassays, while, 18, 15 and 13 biotypes from Multan, D.G. Khan and Bhakkar, respectively were resistant to sulfosulfuron. The results were alarming since number of resistant biotypes far exceeded than susceptible biotypes. The results were communicated to the respective farmers and a change in herbicide chemistry was suggested to the farmer as per test result.



Speaker 4: **Dr. Abdul Ghaffar**
(Department of Agronomy, MNS-UAM)

Topic: **Improved Production Technology of Wheat in the Backdrop of a Changing Climate**

Dr. Ghaffar briefed the participants that Pakistan ranks as the 7th country most vulnerable to climate change on a global scale. Due to climate change unforeseen drought spells and recurrent floods are anticipated. In Punjab, the temperature has risen to 0.65 °C than last century's historic average. The climatologists have predicted a further rise to the tune of 0.2-0.6 °C in ensuing decades. The effects of climate change on crop production are related to shrinking water resources, land degradation and declining crop productivity. He advocated the use of green manures, crop rotation, incorporation of legumes in cropping systems, and residue management to sustain soil health. He said that instead of flat sowing, farmers should adopt bed or ridge planting of wheat as these methods save water and crop remains safe against lodging. Keeping in view the latest climate scenarios, planting window may be extended till November 25. Timely swing of wheat can be accomplished by sowing wheat as a relay crop in standing cotton. He also advised the farmers to apply water and fertilizers in a judicious manner so that resource use efficiency is maximized.



Speaker 5: **Dr. Khuram Mubeen**
(Department of Agronomy, MNS-UAM)

Topic: **Parthenium Weed Eradication: MNS-UAM Initiatives and Success Story**

Dr. Khuram Mubeen discussed about the invasive weeds with special emphasis on parthenium weed or congress grass, and the potential damages incurred by such weeds to an ecosystem. Invasive weeds are a second most important threat to biological diversity after habitat destruction, he added. They intrude in new ecosystem and dominate that surroundings by their resilient characteristics. He put forth the solutions to control these types of weeds. Once established, such weeds are very difficult to manage. In his opinion, precautions and early detection of invasive weeds is the best tool to avoid any uncertainty in future. Invasive weeds usually disperse through wind, water or through vehicles. Invasive weeds present along the water channels, distributaries must be eradicated, he added. Many invasive weeds have transferred across countries so international collaboration in this regard is need of the hour beside creation of awareness among all. Addressing farmers in particular, he advised them to be vigilant with the invasive weeds like *Parthenium hysterophorus* present along the roadsides, non-cropped lands and advocated cleaning of their water courses and farm machinery while moving from one field to the other. He gave a comprehensive overview of initiatives undertaken at MNS-UAM and their outcomes at both university and community level.



Question Answer Session

Afterwards, a question-answer session was held, in which expert panel comprising of Dr. Shafqat Saeed, Dr. Abdul Ghaffar, Dr. Amar Matloob and Dr. Khuram Mubeen briefly answered the questions of farmers and students. One of the farmer exclaimed that he has never participated in such an event where almost all the aspects of weeds and its management have been comprehensively discussed and brought under attention. Farmers asked about new chemistry herbicides for wheat and weed control in minor crops like pulses besides wheat. They were also interested to participate in RISQ test for resistance detection at their fields.





Therefore, we must differentiate and carefully set up the weed eradication plans by applying holistic approaches to secure biodiversity, minimize associated yield losses to ensure food security. Prof. Dr. Asif Ali highly appreciated the timely initiative of weed workshop. He stressed on the need of careful identification and introduction of better management strategies for weed control in wheat. He, further appreciated farmers, South Punjab Agriculture Forum, MNS-UAM faculty and students for their participation.



Concluding Remarks and Vote of Thanks

Prof. Dr. Asif Ali, Vice Chancellor, MNS-UAM offered vote of thanks. He urged all the participants to play their role to minimize crop yield losses due to weeds. He emphasized that it is only possible when we work together for this cause. Emerging challenges and associated trade-offs for their management should be considered. Weeds provide habitat for both, harmful and beneficial insects, and may become the host for many crop diseases.

Field Visit

Farmers and stakeholders were demonstrated a research trial on stale seed bed technology whereby pre sowing tillage was compared with normal sowing for evaluating the weed seed bank dynamics and monitoring the weed population. It was informed that it will be a part of long term weed dynamics monitoring. Glyphosate and paraquat have also been included for monitoring the weed control index. Post emergence weed control adopted by farmers is also included for comparison. Economic analysis and time window availability between cotton and wheat will also be assessed. Residual effects of glyphosate and paraquat in soil system will also be monitored during this long term trial and its effects will be co related with crop health and related effects on soil water, humans etc.

There was a clear cut difference observed and demonstrated to farmers that plots where pre sowing tillage was done removed the soil weed seed bank before crop sowing.

Augmented furrow method of wheat sowing of was also demonstrated. Dr. Abdul Ghaffar and Mr. Mahmood Alam demonstrated farmers about this innovative method of wheat sowing for water saving. Crop growth was better compared to flat sown crop and weed growth was also less. He told that seed

emergence and stand establishment are good under this method. Farmers, students and faculty members inquired about different aspects of augmented furrow method. Training ended after fruitful discussion on augmented furrow method.

Later on, participants visited sunflower field sown by transplanting nursery, and high density plantation of mango.





Media Coverage



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شمارہ 63



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شمارہ 63

انکم این ایس ڈی پبلیشرز کی زیر اہتمام ایک روزہ ترقی و ترقی اور ترقی کا انعقاد

ملتان (انکم این ایس ڈی پبلیشرز) نے انکم این ایس ڈی پبلیشرز کی زیر اہتمام ایک روزہ ترقی و ترقی اور ترقی کا انعقاد کیا گیا۔ اس موقع پر انکم این ایس ڈی پبلیشرز کے بانی اور شریک ممالک: عالمی اخبار اور روزنامہ نے شرکت کی۔ اس موقع پر انکم این ایس ڈی پبلیشرز کے بانی اور شریک ممالک: عالمی اخبار اور روزنامہ نے شرکت کی۔ اس موقع پر انکم این ایس ڈی پبلیشرز کے بانی اور شریک ممالک: عالمی اخبار اور روزنامہ نے شرکت کی۔



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شمارہ 190

انکم این ایس ڈی پبلیشرز کی زیر اہتمام ایک روزہ ترقی و ترقی اور ترقی کا انعقاد

ملتان (انکم این ایس ڈی پبلیشرز) نے انکم این ایس ڈی پبلیشرز کی زیر اہتمام ایک روزہ ترقی و ترقی اور ترقی کا انعقاد کیا گیا۔ اس موقع پر انکم این ایس ڈی پبلیشرز کے بانی اور شریک ممالک: عالمی اخبار اور روزنامہ نے شرکت کی۔ اس موقع پر انکم این ایس ڈی پبلیشرز کے بانی اور شریک ممالک: عالمی اخبار اور روزنامہ نے شرکت کی۔ اس موقع پر انکم این ایس ڈی پبلیشرز کے بانی اور شریک ممالک: عالمی اخبار اور روزنامہ نے شرکت کی۔



Prof. Dr. Asif Ali,
Vice Chancellor, MNS-UAM
requests your kind participation in



One day workshop on
**Integrated
Weed Management
for Sustainable
Wheat Production**

February 26, 2019

Venue: MNS-University of Agriculture, Multan

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