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Proceedings

अखिल भारतीय समन्वित खरपतवार प्रबंधन परियोजना की तीसरी वार्षिक समीक्षा बैठक

XXX Annual Review Meeting of All India Coordinated Research Project
on Weed Management

स्थान

शेर-ए-कश्मीर कृषि विज्ञान एवं प्रौद्योगिकी विश्वविद्यालय, जम्मू

26–27 मई, 2023

Venue

Sher-e-Kashmir University of Agricultural Sciences and Technology, Jammu

26-27 May, 2023



भा.कृ.अनु.प.-खरपतवार अनुसंधान निदेशालय

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ICAR-Directorate of Weed Research

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Proceedings of XXX Annual Review Meeting
All India Coordinated Research Project on Weed Management
26-27 May, 2023, held at
Sher-e-Kashmir University of Agricultural Sciences and Technology, Jammu

26 May, 2023

INAUGURAL SESSION

The inaugural programme was organized on 26th May, 2023 in the university auditorium. Dr. S.K. Chaudhari, DDG (NRM), ICAR, New Delhi was the Chief Guest. Prof. Nazeer Ahmad Ganai, Vice-Chancellor, SKAUST-Jammu and Kashmir presided over the session. Dr. Rajbir Singh, ADG (A,AF&CC), ICAR, New Delhi was the Guest of Honour. Dr. R.K. Samnotra, Director of Research, SKAUST-Jammu, Dr. J.S. Mishra, Director, ICAR-Directorate of Weed Research, Jabalpur, Dr. R.P. Dubey, In-charge, AICRP-Weed Management, Dr. B.R. Bazaya, PI, SKUAST, Jammu centre and about 150 participants comprising scientists from AICRP-WM centres, ICAR-DWR and other institutes, faculty members, statutory officers and students of SKUAST-Jammu, officials from state government and representatives from pesticide industries attended the inaugural session.

Dr. J.S. Mishra in his welcome address, briefly mentioned about the genesis of AICRP-WM and role played by the AICRP-WM centers in developing and disseminating the weed management technologies in different crops and cropping systems in various agro-ecological regions of the country. Dr. S.K. Chaudhari in his virtual address, highlighted the importance of weed management in sustainable food system and congratulated the weed scientists for their significant contributions. He emphasized the various issues and challenges in weed management such as climate change, herbicide resistance problems in weeds, weed seed dispersal, socio-economic impacts of weeds etc. He stressed upon the need to work on emerging challenges to be linked with national priorities like natural farming, organic farming, management of herbicide resistant weeds, weed risk assessment, digital farming, artificial intelligence, precision weed management tools, drone-based application of herbicides, etc. Prof. Nazeer Ahmad Ganai suggested to study the impact of weeds on crop loss and development of effective weed management technologies to minimize the extent of crop loss due to weeds. Judicious use of herbicides is essential to minimize the impact of herbicides on environment, he added. Dr. Rajbir Singh highlighted the impact of climate change on crop-weed competition. He also emphasized the success stories of direct-seeded rice (DSR) during Covid period in Punjab and Haryana and urged the scientists to work on DSR while considering the upcoming release of herbicide tolerant rice cultivars and residue mulching technologies. Dr. R.K. Samnotra, Director of Research, SKAUST-Jammu, in his opening remarks, highlighted the major weeds in rice, vegetable crops, pasture land, forest land, other field, and fodder crops and water bodies. He mentioned the importance of timely technological interventions and effective policy execution for minimizing weed problems in these eco-systems. Dr. R.P. Dubey proposed the vote of thanks.

The 'Best Center Award for 2022-23' was received by UAS, Bengaluru center.

Following seven publications were released during the session.

1. Annual Report of AICRP-Weed Management-2022
2. Technical bulletin on "Weed management in millets" by ICAR-DWR, Jabalpur
3. Technical bulletin on "Weed Management in Pearl millet" by SKNAU, Jobner Centre
4. Weed Management App developed by IGKV, Raipur centre
5. Booklet on "Success stories of improving farmers income through adoption of weed management techniques" IGKV, Raipur centre
6. Leaflet on "Integrated weed Management in Minor Millets" by UAS, Bengaluru centre
7. Book on "Organic and Biofertilizers" by Saraswati Agro Chemicals (India) Pvt. Ltd.

TECHNICAL SESSION - I (Presentation by coordinating centres)

- Chairman** : Dr. Rajbir Singh, ADG (AAF &CC), ICAR, New Delhi
Co-Chairman : Dr. J.S. Mishra, Director, ICAR-DWR, Jabalpur
External Expert : Dr. N. N. Angiras, Professor (Retd.), CSKHPKV, Palampur
Rapporteurs : 1. Dr. V.K. Choudhary, Sr. Scientist (Agronomy), ICAR-DWR, Jabalpur
2. Dr. S.P. Singh, Co-PI, AICRP-WM, GBPUAT, Pantnagar

At the outset, Dr. R.P. Dubey presented the highlights of the achievements of the work done under AICRP-WM during 2022-23. Thereafter, PIs of the coordinating centers presented the salient findings.

PAU Ludhiana,

- In Punjab, the emergence of grassy weeds in rice and *Poa annua* in wheat is the major problem.
- In pea, post-emergence application of clodinafop + metribuzin provided excellent weed control, higher yield and economics.
- In CT (DSR)-ZT (wheat) system the incidence of *Phalaris minor* drastically reduced, whereas in puddled transplanted rice – CT (wheat) it is gradually increasing. Retention of crop residues under conservation agriculture significantly improved dehydrogenase activity and soil health.
- *Phalaris minor* is resistant to common post-emergence herbicides, the inclusion of pyroxasulfone alone or with pendimethalin provides good control.
- Herbicide residues in the majority of the samples (grain, straw, soil and water) were found below the detectable limit.
- Surface seeding technology in wheat reduced the weed severity, cost-effective, and not required high capacity tractor. In this, many operations (harvesting, seeding, cleaning, and residue management) can be done at a time.
- *Tar-wattar* technology of rice establishment was further evaluated under bed planter with compaction, by this weed pressure can be minimized and further 8% saving of irrigation water.
- Centre has presented weeds of national importance (WoNI) and also impact assessment of the technologies disseminated considering yield improvement, area coverage, cost saving and improvement in soil health.
- The mapping of aquatic weed infestation was initiated through remote sensing but accuracy is only about 13%, it further needs ground truthing and modification.
- The centre has passed-on seven technologies to the state for inclusion in state packages or practices.

Comments/Suggestions:

- Make video of *Tar-wattar* technology in rice and surface seeding in wheat, circulate it to end users across the country.

HAU, Hisar

- *Echinochloa colona* and *E. crus-galli* are problematic weeds in rice.
- *Tar-wattar* technology was evaluated but did not perform well.
- In the first year of study, there was no effect of tillage, whereas ZT + R along with integrated weed management provided better yield and system productivity in rice-wheat system. In ZT plots, soil compaction was recorded on the surface, but in CT lower layer was compact.

- Long-term use of herbicides of the same mode of action and injudicious use resulting in the development of herbicide resistance. These can be potentially managed by applying pyroxasulfone 127.5 + pendimethalin 1500 g/ha as pre-emergence followed by either mesosulfuron+iodosulfuron 14.2 g/ha or clodinafop+metribuzin 270 g/ha. Likewise, aclonifen + diflufenican *fb* mesosulfuron + iodosulfuron, pyroxasulfone+pendimethalin *fb* metribuzin + clodinafop provides good control on resistant as well as susceptible *P. minor* population. Apart from these, the application of metribuzin 300 g/ha after 1st irrigation also provides good control at Hisar. Retention of crop residues moderates the soil temperature.
- In some areas, bispyribac-sodium alone is not performing in rice and imazethapyr is not providing control to *Digera arvensis* in greengram.
- The center has studied 10 weeds of national importance.

Comments/Suggestions:

- Yield and economic loss due to resistant weeds need to be quantified.
- Ensure release of healthy bio-agents for control of aquatic weeds otherwise misleading information will be generated.
- *Orobanche* infestation area and yield loss need to be quantified.

GBPUAT, Pantnagar

- In *Tar-wattar* technology, delaying irrigation water up to 14 DAS increased the WCE but there was no yield advantage.
- Application of pendimethalin *fb* bispyribac-sodium + chlorimuron+metsulfuron and penoxsulam + pendimethalin *fb* fenoxaprop+ethpxysulfuron provided better weed control, higher yield, and B: C.
- In conservation tillage, DSR (ZT+R)- ZTR-ZTR system along with pendimethalin *fb* bispyribac-sodium *fb* hand weeding *fb* weed seed harvest provided better weed control, higher crop yield, and B: C.
- In organic agriculture, stale seedbed - DSR+sesbania (rice), mechanical weeding (cono weeder) *fb* hand weeding (25 DAS) provided better weed control and higher yields.
- First year trial on comparison of different farming practices suggests that chemical farming is better in terms of weed control, yield, and economics followed by organic farming and natural farming.

Comments/Suggestions:

- Partially weedy treatment needs to be specified.
- Submit the WoNI report within a week.
- It is important to submit the desired information in the prescribed format to PC unit.

PJTSAU, Hyderabad

- In Telangana, *Leptochloa chinensis* in DSR and Azolla complex and algal bloom in rice fields are emerging problems.
- In sorghum, atrazine 500 g/ha *fb* 2,4-D ethyl ester 500 g/ha or topramezone 18.6 g/ha (lower dose) was found effective.
- In maize, sequential application of atrazine 1000 g/ha *fb* topramezone 25.2 g/ha or tembotrione 120 g/ha / ready mix of atrazine +mesotrione 875 g/ha provided better weed control. It was also noticed that in *Cyperus rotundus* dominated area, atrazine + mesotrione 875 g/ha performed better over others.

- In the cotton-based cropping system, sole cotton with IWM provided higher yield and economics due to higher lint prices, although intercropping indices were better with intercropping.
- Under conservation agriculture, the adoption of ZTR-ZTR-ZTR had more weeds but recorded higher yield and B:C, may be due to changes in the rhizospheric atmosphere. In ZTR plots root colonization with VAM has been noticed.
- In tomato-beetroot-water melon cropping system under the organic system, polythene mulch and straw mulch were found effective.
- Under weeds of national importance, *Parthenium hysterophorus*, *Cyperus rotundus*, water hyacinth, *Celosia argentea*, and *Echinochloa crus-galli* were found important.
- For herbicide residues at crop harvest, the majority of herbicides were found up to 30 days after application and at crop harvest, they were below the detectable limit.
- *Striga* infestation has been significantly reduced using UASD-AMF microbial consortium.
- Application of herbicide through drone has been standardized, and it was found that 20 L/ha, at 1.5 m height above crop with 5 m buffer can be used.

Comments/Suggestions:

- The presentation was appreciated by the house.
- Take up detailed study of WoNI in other districts.

UAS, Bengaluru

- *Cuscuta* in onion and pulses are emerging weeds.
- *Parthenium*, *Chromolaena* and water hyacinth are problematic, *Chromolaena* and water hyacinth are offering more competition.
- In dry-seeded rice, application of pendimethalin 1.0 kg/ha *fb* either tank mix of bispyribac-Na 25 g/ha + chlorimuron+metsulfuron 4 g/ha or penoxsulam + cyhalofop 135 g/ha provides broad-spectrum weed control.
- In finger millet, atrazine 500 g/ha *fb* chlorimuron+metsulfuron 4 g/ha provided better weed control, higher yield, and economics.
- In soybean, sulfentrazone+clomazone 725 g/ha or diclosulam 26 g/ha (PE) and need-based post-emergence herbicides provide effective weed control.
- In sesame, pendimethalin 750-1000 g/ha (30 EC) or alachlor 1.0 kg/ha was found effective.
- In maize-based cropping system, CT+R along with IWM (atrazine *fb* topramezone *fb* HW *fb* weed seed harvest) was found effective, productive, and profitable.
- In direct-seeded finger millet, reduced spacing, crop residue mulch *fb* HW and stale seedbed *fb* HW were found effective.
- In Kodo millet, chlorimuron+metsulfuron 4 g/ha or 2,4-D 500 g/ha were found effective.
- *Salvinia molesta* in rice fields can be managed using cafentrazone-ethyl 20 g/ha and chlorimuron+metsulfuron 4 g/ha
- *Alternanthera philoxeroides* extract is suppressing the growth of water hyacinth, however, this need further detailed study.

Comments/Suggestions:

- A systematic study is required before reporting resistance of *Roettbolia cochinchinensis*.
- The weed seed bank study needs to be refined and proper reporting is required.

TNAU, Coimbatore

- In transplanted rice, bensulfuron+pretilachlor 660 g/ha *fb* bispyribac-sodium 25 g/ha provides broad-spectrum weed control, higher yield, and economics.
- In the cotton-baby corn system under conservation agriculture, CT-CT-CT system with atrazine 1.0 kg/ha *fb* brush cutter at 45 DAS (in baby corn), whereas CT-ZT-ZT with pendimethalin *fb* directed spray of paraquat 600 g/ha (in cotton) was found effective.
- The application of microbial consortium developed by UASD-AMF at 8 kg/acre considerably reduced the *Striga* infestation in sugarcane.
- Release of beetles in water hyacinth could reduce the weed biomass by about 30%.
- Except atrazine in maize, all the herbicides were found at below detectable limit in soil and plant samples at harvest.
- Under weeds of national importance, *Cyperus rotundus*, *Parthenium hysterophorus*, *Cynodon dactylon*, *Prosopis juliflora* (non-crop area) and aquatic weeds were the major problem.

Comments/Suggestions:

- Herbicide residue analysis on fingers of baby corn is more important than plant at harvest.
- History of herbicides used need to be recorded while collecting samples.

KAU, Thrissur

- *Xanthium strumarium*, *Ischaemum rugosum*, and *Cyperus* sp. are problematic weeds.
- *Cuscuta* in non-cropped situation can be controlled by foliar application of 5% urea solution.
- Pond liming through burnt lime (CaO) at 20 g/L can control many aquatic weeds.

Comments/Suggestions:

- Check the herbicide residue data, especially during the early stage of sampling.

AAU, Jorhat

- *Ludwigia peruviana* and *Mimosa diplotricha* are problematic weeds
- *Cassia* sp. is replacing *Parthenium hysterophorus*.
- In rice-rice system, rotation of pyrazosulfuron 20 g/ha and pretilachlor 600 g/ha as pre-emergence *fb* bispyribac-sodium 25 g/ha under 75% chemical and 25% organic nutrient source provides good weed control, obtained higher yield and B:C.
- In aromatic rice, placement of paddy straw *fb* hand weeding provides good weed control, and higher yield.

Comments/Suggestions:

- While reporting the spread of weeds, data from previous years need to be presented.
- Detailed data on WoNI is required.
- Proforma should be followed for WoNI and impact assessment.

TECHNICAL SESSION – II (Presentation by coordinating centres)

Chairman : Dr B.C. Sharma, Dean and Head of Division of Agronomy, SKUAST,

Jammu

- Co-Chairman** : Dr. J. S. Mishra, Director, ICAR-DWR, Jabalpur
External Expert : Dr N. N. Angiras, Professor (Retd.), CSKHPKV, Palampur
Rapporteurs : 1. Dr. Yogita Gharde, Sr. Scientist, ICAR-DWR, Jabalpur
2. Dr. Todar Mal Poonia, Principal Investigator, CCSHAU, Hisar

Salient findings for the year 2022-23 were presented by the respective PIs of the centers.

OUAT, Bhubaneswar

- In weed management in dry DSR, penoxsulam + pendimethalin (RM) 625 g/ha as PE *fb* fenoxaprop-ethyl 67 g/ha + ethoxysulfuron 18 g/ha as PoE at 25 DAS recorded lowest weed index and highest grain yield along with highest BC ratio.
- In transplanted onion, application of oxyfluorfen *fb* oxyfluorfen + quizalofop (RM) was found as the best treatment.
- For the management of *Orobanche* in brinjal and tomato, neem cake 200 kg/ha *fb* ethoxysulfuron 25 g/ha at 25 and 50 DAS was found superior.
- In organically grown finger millet in finger millet-pulse cropping system, stale seed bed *fb* hand weeding treatment gave good results.
- Two zones were surveyed for finding the weeds of national importance (WoNI) and *Echinochloa colona* along with *Cyperus rotundus* were reported as important weeds.
- *Ipomoea pes-caprae* (beach morning glory) appeared as new weed in East and South Eastern Coastal zone of Odisha.
- A recommendation on weed management in toria as application of pendimethalin 30 EC @ 0.750 kg/ha as PE *fb* straw mulch 5 t/ha was passed on to the state government.

Comments/Suggestions:

- Detailed data on WoNI is required.
- Proforma should be followed for WoNI and impact assessment.

IGKV, Raipur

- In dry DSR, application of pendimethalin 1.0 kg/ha PE *fb* bispyribac-NA 25 g/ha + (metsulfuron + chlorimulron (RM)) 4 g/ha (TM) PoE was found effective in controlling weed flora and also gave higher yield.
- Weed management in direct-seeded finger millet, atrazine 500 g/ha PE *fb* 2,4-D Na salt 800 g/ha recorded lowest weed biomass and highest grain yield.
- Weed management in rice-maize-legume cropping system under CA, rice yield was higher under CT+R-CT+R-CT+R and integrated weed management treatments.
- Higher rice yield was obtained with two hand weeding in organically grown aromatic rice.
- *Cyperus iria* is reported as weeds of national importance (WoNI) in Balod district.

Comments/Suggestions:

- Detailed data on WoNI is required.
- Proforma should be followed for WoNI and impact assessment.

SKUAST, Jammu

- In R.S. Pura block, development of resistance in *Phalaris minor* against clodinafop was reported.
- Higher wheat yield was reported under CT and FIRBS as compared to ZT, but BC ratio was higher under ZT wheat. Pendimethalin as PE gave better results in term of weed control and yield.

- Under organically grown rice-knol khol cropping system, 8 t/ha paddy straw as mulch *fb* hand weeding resulted in higher yield of knol khol as compared to other treatments.
- In *tar-vattar* DSR, irrigation at 21 DAS gave higher BC ratio, while under weed management, application of pendimethalin 1.0 kg/ha PE *fb* bispyribac-NA 25 g/ha + (metsulfuron + chlorimulron (RM)) 4 g/ha (TM) PoE gave higher yield and WCE.
- Under WoNI, *Cirsium arvense* in Jammu district and *Ranunculus* spp. in Kathua and Sambha districts are important weeds.

Comments/Suggestions:

- Confirm if there is development of resistance in *Phalaris minor* to other than clodinafop herbicide.
- Detailed data on WoNI is required.
- Proforma should be followed for WoNI and impact assessment.

BCKV, Kalyani

- Under dry-DSR, rice yield was higher with the application of pendimethalin 1.0 kg/ha PE *fb* bispyribac-NA 25 g/ha + (metsulfuron + chlorimulron (RM)) 4 g/ha (TM) PoE.
- In transplanted onion, oxyfluorfen 100 g/ha PE *fb* quizalofop + oxyfluorfen 100 g/ha was the best treatment in terms of onion bulb yield.
- Weed management in soybean with application of imazethapyr + propaquizafop (RM) 125 g/ha resulted in lower weed biomass, higher grain yield and BC ratio.
- In Nadia district, *Parthenium* infested both cropped and non-cropped area and reported as important weed.

Comments/Suggestions:

- Discontinue the experiment on *Salvinia* as this weed is not commonly found in rice fields in West Bengal.
- For finding weeds of national importance (WoNI), conduct the survey as per guidelines and proforma provided. Detailed data on WoNI is required.
- Proforma should be followed impact assessment.

CSKHPKV, Palampur

- In dry DSR, pendimethalin 1.0 kg/ha PE *fb* bispyribac-NA 25 g/ha + (metsulfuron + chlorimulron (RM)) 4 g/ha (TM) PoE (25-30 DAS) effectively reduced the total weed count and weed biomass, however, penoxsulam + pendimethalin (RM) 625 g/ha PE *fb* bispyribac-Na 25 g/ha PoE were comparable with two hand weeding.
- In soybean, flauzifop-p-butyl + fomesafen (RM) 250 g/ha showed better results than other treatments.
- In pea, pre-emergence application of imazethapyr 75 g/ha *fb* propaquizafop at 50 g/ha PoE provided better results.
- In WoNI, *Lantana camara*, *Parthenium* and *Ageratum* are reported as three important weeds.

Comments/Suggestions:

- It was suggested that IWM should be kept as check by keeping in mind farmers' practice.

RVSKVV, Gwalior

- In sorghum, application of bentazone 960 g/ha PoE provided minimum weed population and biomass of total weeds at 60 DAS, however, higher yield was obtained with the application of atrazine + mesotrione (RM) 656 g/ha PoE application.
- In maize under maize-chickpea cropping system, higher WCE and yield was reported under atrazine + topramezone (TM) (750+25.2) g/ha EPoE (15 DAS) application.

- Under CA system, in maize-based cropping system, highest grain and stover yield were obtained in ZT+R-ZT+R-ZT+R system along with maximum net returns and BC ratio. Among weed management treatment, IWM (atrazine 1.0 kg/ha *fb* topramezone 25.2 g/ha with one hand weeding suppressed the weed population and weed dry weight at 60 DAS.

Comments/Suggestions:

- Detailed data on WoNI is required.
- Proforma should be followed for WoNI and impact assessment.

AAU, Anand

- Invasion of *Argemone mexicana* in different parts of Gujarat in new cultivated fields was observed as new emerging threat in Gujarat.
- In weed management in cotton-greengram cropping system under CA, seed cotton equivalent yield was recorded significantly higher in (2.39 t/ha) in ZT+R-ZT+R system along with highest BC ratio.
- In onion nursery, pendimethalin 38.7 CS 580.5 g/ha as PPI and propaquizafop 5% + oxyfluorfen 12% EC (Ready-mix) 43.75 + 105 g/ha as PoE were found effective for weed management.
- Application of pendimethalin 38.7% CS 680 g/ha at 10 DAS, pendimethalin 30% + imazethapyr 2% EC 800 g/ha PE were found effective for *Cuscuta* management in Lucerne.

Comments/Suggestions:

- Detailed data on WoNI is required.
- Proforma should be followed for WoNI and impact assessment.

MPUAT, Udaipur

- In aquatic system, *Najas minor* and *Hydrilla verticillata* are the new appearances, however, in *Kharif* season, *Ipomoea trifida* was the new emerging weed.
- In sorghum, atrazine + topramezone (Tank-mix) EPoE recorded the maximum seed yield (2.88 t/ha).
- In soybean-based cropping system under CA, highest net returns and BC ratio were realized with CT-CT-CT among tillage and residue management.
- In organically grown fenugreek under baby corn-fenugreek cropping system, maximum seed yield (1823 kg/ha) and haulm yield (4492 kg/ha) of fenugreek were recorded with crop sown with stale seed bed technique with plastic mulch.

Comments/Suggestions:

- Reduce the dose of atrazine from 750 g/ha to 500 g/ha in tank-mix application for weed management in maize.

PDKV, Akola

- In organically grown cotton, higher seed cotton yield (1.09 t/ha) was registered with plastic mulching at sowing on BBF (broad bed furrow).
- In soybean, sulfentrazone 28% + clomazone 30% WP 725 g/ha PE resulted in higher WCE. Among PoE herbicides, application of imazethapyr + propaquizafop (RM) 125 g/ha reported higher WCE.
- Widespread appearance of *Alternanthera triandra* on fallow lands and field bunds in Eastern Vidarbha region was observed.

Comments/Suggestions:

- Give emphasis on studying WoNI.

TECHNICAL SESSION – III (Release of online data portal and presentation by volunteer centres)

- Chairman** : Dr. Rajender Parsad, Director, ICAR-IASRI, New Delhi
Co-Chairman : Dr. J.S. Mishra, Director, ICAR-DWR, Jabalpur
External Expert : Dr. N. N. Angiras, Professor (Retd.), CSKHPKV, Palampur
Rapporteurs : 1. Dr. Rabiratna Dash, Principal Investigator, OUAT, Bhubaneswar
2. Dr. P. Saravanane, Principal Investigator, PJANCoA, Puducherry

Dr. Rajender Parsad and Dr. Sukant Dash, Sr. Scientist from ICAR-IASRI, New Delhi joined in virtual mode.

In this session, the much awaited ‘online data submission module’ was officially released. After that, there was a brief online presentation by Dr. Sukant Dash. It has been decided that before its final implementation, there will be one online awareness training programme by Dr. Yogita Gharde, Sr. Scientist, ICAR-DWR with all the PIs of the centres.

Presentation by PIs of volunteer centers (except BAU, Sabour) was made.

SKUAST, Kashmir

- Post-emergence application of penoxsulam/ bispyribac sodium/ (metsulfuron methyl + chlorimuron ethyl) were better in controlling weeds having 80% WCE in direct-seeded rice (DSR).
- In maize, application of atrazine *fb* tembotrione was better with 87% WCE and 8% WI.
- In Wheat, application of pendimethalin 1000 g/ha *fb* clodinafop was better in controlling the complex weed flora.

Comments/Suggestions:

- Take need based and location specific experiments for high value crops and orchards.

BUA&T, Banda

- In wheat, PoE application of sulfosufuron + metsulfuron 32 g/ha showed better result in comparison to other treatments.
- In chickpea, sequential application of either pendimethalin 1000 g/ha or oxyfluorfen 100 g/ha *fb* imazethapyr 40 g/ha was found better in controlling the mixed weed flora. However, the application of topramezone 25 g/ha was found to be phytotoxic in chickpea.
- In another experiment, pre-emergence application of pendimethalin *fb* tank mix application of bispyribac sodium + (chlorimuron ethyl + metsulfuron methyl) (RM) in DSR proved to be better in controlling weeds.

Comments/Suggestions:

- Presentation to be done by following standard statistical procedures.

SKNAU, Jobner

- Post-emergence tank mix application of (pyroxasulfone + metsulfuron) 127 g/ha was found better in controlling complex weed flora in barley. The pre-emergence application of this herbicide combination showed phytotoxicity.
- In mustard, pendimethalin 750 g *fb* 1 HW 25 DAS proved to be better in managing weeds and increasing productivity. But phytotoxic effect was observed when (propaquizafop + oxyfluorfen) was applied as post-emergence in mustard.
- In groundnut, (sodium acifluorfen + clodinafop propargyl) 200 g/ha or (propaquizafop + fomesafen) 250 g/ha proved to be better in controlling weeds.
- In clusterbean, (propaquizafop + imazethapyr) 125 g/ha performed better in controlling weeds.

- In sorghum, all post-emergence herbicides like (tembotrione/ tropramezone/ mesotrione) are phytotoxic.

Comments/Suggestions:

- The dose of the herbicides should be standardized based upon the local response and phytotoxicity study.

UAS, Dharwad

- Application of sulfentrazone + clomazone 725 g/ha in soybean has proved better in controlling weeds.
- A new study is being carried out to isolate some microbial strains tolerant to herbicides. In this connection, *Glomus intraradices* was found to be an herbicide tolerant fungus.

Comments/Suggestions:

- More laboratory and field study to be taken up to isolate the specific herbicide tolerant strains.

ANGRAU, Guntur

- Five new weeds were reported, which are *Phyllanthus maderaspatensis* in rice fallow pulses, *Cardiospermum halicacabum* in zero till blackgram, *Cressa cretica* in sand patches, *Chrozophora rotleri* and *Paspalum distichum* in DSR.
- In sorghum, phytotoxicity was observed due to tank mix application of (atrazine + mesotrione) 438 g/ha while atrazine 750 g/ha fb 2,4-D amine salt 750 g/ha was effective in controlling weeds.
- In kodo/proso millet, atrazine in its recommended dose showed no phytotoxic effect. However, the pre-emergence application of metolachlor/butachlor showed phytotoxicity.
- Application of pyrazosulfuron ethyl 15 g/ha as pre-emergence fb (metsulfuron methyl+chloromuron ethyl) 4 g/ha in finger millet has been proved to be better in controlling weeds.
- Drones are used for spraying herbicides and it has been calibrated at 25 liters of water per hectare.

Comments/Suggestions:

- The dose of the herbicides should be standardized based upon the local response and phytotoxicity study.

PJNCO&RI, Puducherry

- A new weed species on Kodaikanal beach i.e. *Ipomoea pes-caprae* was reported.
- Penoxsulam + pendimethalin (RM) 625 g/ha fb bispyribac sodium 25 g/ha in DSR and pyrazosulfuron ethyl 15g/ha fb 2,4-D Na salt 800 g/ha in finger millet are found to be better in controlling weeds.

Comments/Suggestions:

- Take up experiments based on the local needs.

TECHNICAL SESSION – IV (Interaction with industry and general discussion on administrative and financial issues)

Chairman	: Dr J.S. Mishra, Director, ICAR-DWR, Jabalpur
Co-Chairman	: Dr R.P. Dubey, In-charge, AICRP-WM, ICAR-DWR, Jabalpur
External Expert	: Dr. N. N. Angiras, Professor (Retd.), CSKHPKV, Palampur
Rapporteurs	: 1. Dr. Kamala Bai, UAS, Bengaluru 2. Dr. Varsha Gupta, RVSKVV, Gwalior

At the outset, the Chairman welcomed Industry stake holders. During the session, Dr. Gopal Rathore M/s., Saraswathi Agro Chemical (India) Pvt. Ltd., and Shri. Rahul Katkar, M/s. Chambal Fertilizers, joined the interaction with the Industry.

Dr. Gopal Rathore M/s., Saraswathi Agro Chemical (India) Pvt. Ltd., informed that they have one NABL accredited laboratory and has facility on evaluation of bio efficacy and formulation of different herbicides. They will be able to analyze plant based secondary metabolites, if needed. The industry also expressed they will be happy to collaborate with ICAR- DWR and AICRP-Weed Management centers in the field of research and development.

Some of the administrative and financial issues were discussed. It was emphasized that funds will be released only after the receipt of AUC in specified format.

Concluding / plenary session

The concluding session was attended by the Chief Guest, Dr. R.K. Samnotra, Director of Research, SKUAST-Jammu, Dr. J.S. Mishra, Director, ICAR-Directorate of Weed Research, DWR, Dr. N.N. Angiras, External Expert, Professor (Retd.), CSHPKV, Palampur, Dr. R.P. Dubey, In-charge, AICRP-Weed Management and Dr. B.R. Bazaya, Principal Investigator, SKUAST, Jammu and scientists of AICRP-WM and ICAR-DWR.

All the rapporteurs presented the report of the technical sessions.

Comments of Dr. N.N. Angiras

- i. The research activities on survey and surveillance are essential at an interval of 5 years and change of weed flora need to be monitored.
- ii. Execution of long-term experiments are important.
 - To understand the resistance problems of weeds whether it is due to faulty application or due to active compound.
 - To monitor the residue of herbicides in soil, water bodies and food chain.
 - To monitor the effect of herbicides on microbes.
 - To analyze the effect of treatments on soil physico-chemical properties
- iii. In split-plot design emphasis needs to be given on interaction effect.
- iv. In case of short duration crops like baby corn, vegetables etc. herbicides residue analysis is essential.
- v. State and National level mapping of Weeds of National Importance need to be taken up at the highest priority.
- vi. Data generation of Impact Assessment of weed management technologies developed by different AICRP centres in terms of yield enhancement and monetary gain are important to convince the policy makers.
- vii. In case of weed management in organic farming, technical programmes need to be formulated while considering the treatment combination like stale seed-bed + cultural practices + weed suppressing variety.
- viii. In case of integrated weed management practices, farmers's practice + cultural practices + herbicides need to be considered in order to reduce the load of herbicides.

Remarks by Dr. J.S. Mishra

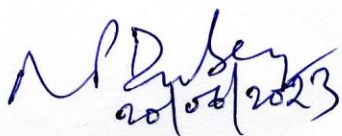
- i. He reiterated the objectives and importance of conducting research activities on Weeds of National Importance and Impact Assessment of Weed Management Technologies as per the prescribed format to all the AICRP centres.
- ii. This year onward, for evaluating AICRP centres, ranking based on prescribed pro-forma developed by ICAR will be given to the centres.
- iii. Visibility of the centres can be enhanced in terms of publication like papers published in reputed journals, bulletins, Apps developed etc.
- iv. Apps developed by AICRP centres can be uploaded to the website of concerned University and also at the website of ICAR-DWR.
- v. ICAR-DWR is in process to develop the weed seed museum and for which all the centres are requested to send the weed seeds to DWR.
- vi. All the centres are suggested to plan and prioritize their experiments based on the resources available and these experiments should be linked with national programmes like natural farming, organic farming, management of herbicide resistance, weed risk assessment, digital farming, artificial intelligence, per drop more crop etc.

Dr. R.K. Samnotra, in his address, highlighted the efficient use of natural resources in order minimize the load of artificial resources by adopting precision farming. He also emphasized to conduct experiments in net-working mode on the national issues. He added that each centre has the responsibility to reduce the magnitude of crop loss due to weeds. He urged the scientist to find out the molecules, which have low residue in environment and food-chain and to initiate the experiments on weed management in fodder crops and orchards. In his final remarks, he appreciated the efforts made by the AICRP centres. The session ended with vote of thanks proposed by Dr. B.R. Bazaya, Principal Investigator, SKUAST, Jammu.

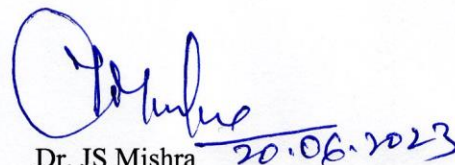
Recommendations:

Recommendations emerged out of the XXX Annual Review Meeting of AICRP-Weed Management held during 26-27 May 2023 at SKUAST, Jammu

1. Carry out impact assessment of weed management technologies developed by the centers on the basis of area of adoption, productivity gains and monetary benefits at the state/country level.
2. Develop information on Weeds of National Importance.
3. Estimation of wheat area (district wise) in Punjab and Haryana infested with herbicide resistant biotypes of *Phalaris minor*, and the impact of weed management technologies on increasing wheat productivity and income or reducing yield losses due to *P. minor* in these two states.
4. Study the feasibility of the *tar-wattar* technology in direct-seeded rice (DSR) developed at PAU, Ludhiana.
5. The coordinating centres need to develop weed management technology under organic farming.
6. Each coordinating center to take efforts to make 1-2 villages Parthenium-free with the help of some funds allocated for national mission of Sawachhta under MGNREGA.
7. Publish the weed management technologies and success stories developed by the coordinating centers in the form of technical bulletins on regional-basis, jointly with ICAR-DWR.



Dr RP Dubey
Pr. Scientist & In-charge AICRP-WM



Dr. JS Mishra
Director, ICAR-DWR

XXX ANNUAL REVIEW MEETING
OF
ALL INDIA COORDINATED RESEARCH PROJECT ON WEED MANAGEMENT
ICAR - DIRECTORATE OF WEED RESEARCH, JABALPUR

Venue

**Sher-e-Kashmir University of Agricultural Sciences & Technology, Jammu
(J&K)**

26-27 MAY, 2023

PROGRAMME

26th May, 2023 (Friday)

Registration : 8:30 AM

9:30-10:30 hrs	INAUGURAL SESSION
Lighting of lamp	By the Hon'ble dignitaries
Welcome address	Dr. J.S. Mishra, Director, ICAR - DWR, Jabalpur
Introductory remark	Dr. R.K. Samnotra, Director Research, SKUAST- Jammu
Remarks by Guests of Honour	1. Prof. Nazir Ahmad Ganai, Vice-chancellor, SKUAST- Jammu 2. Dr. Rajbir Singh, ADG (Agro., AF & CC), ICAR, New Delhi
AICRP-WM Best Centre Award & Release of publications	By the Hon'ble dignitaries
Address by Chief Guest	Dr. S. K. Chaudhari, DDG (NRM), ICAR, New Delhi
Vote of thanks	Dr. R.P. Dubey, Pr. Scientist and In-charge, AICRP-WM
Rapporteurs	1. Dr. P. K. Mukherjee, Pr. Scientist, ICAR-DWR, Jabalpur 2. Dr. Shrikant Chitale, Principal Investigator, IGKV, Raipur
10:30-11:00 hrs	High Tea
TECHNICAL SESSION – I	
Chairman	Dr. Rajbir Singh, ADG (AAF & CC), ICAR, New Delhi
Co-Chairman	Dr. J.S. Mishra, Director, ICAR – DWR, Jabalpur
External Expert	Dr. N.N. Angiras, Professor (Retd.), CSHPKV, Palampur
Rapporteurs	1. Dr. V. K. Choudhary, Sr. Scientist, ICAR-DWR, Jabalpur 2. Dr. S.P Singh, Co-PI, AICRP-WM, GBPUAT, Pantnagar
11:00-13:30 hrs	Presentation on salient achievements and recommendations of AICRP on Weed Management by Dr. R.P. Dubey, In-charge, AICRP-WM
	Presentation of salient findings by Principal Investigators of AICRP-WM centres (15 min. for each centre)
	PJTSAU, Hyderabad : T. Ramprakash
	UAS, Bengaluru: Dr. K.N. Geetha
	TNAU, Coimbatore: Dr. S. Radhamani
	KAU, Thrissur: Dr. P. Prameela
	AAU, Jorhat: Dr. Khagen Kurmi
	OUAT, Bhubaneswar: Dr. Rabiratna Dash

	IGKV, Raipur: Dr. Shrikant Chitale
	BCKV, Kalyani: Dr. Bikash Mandal
	Remarks by Chairman, Co-Chairman and external expert
13:30- 14:30 hrs	LUNCH BREAK
TECHNICAL SESSION – II	
Chairman	Dr. J.S. Mishra, Director ICAR-DWR, Jabalpur
Co-Chairman	Dr. B.C. Sharma, Dean & Head, Div. of Agronomy, SKUAST, Jammu.
External Expert	Dr. N.N. Angiras, Professor (Retd.), CSHPKV, Palampur
Rapporteurs	1. Dr. Yogita Gharde, Sr. Scientist, ICAR-DWR, Jabalpur 2. Dr. Todar Mal Poonia, Principal Investigator, CCSHAU, Hisar
14:30-16:45 hrs	PAU, Ludhiana: Dr. M.S. Bhullar
	CCSHAU, Hisar: Dr. Todar Mal Poonia
	GBPUAT, Pantnagar: Dr. Tej Pratap
	CSKHPKV, Palampur: Dr. S.S.Rana
	SKUAST, Jammu: Dr. B.R. Bazaya
	RVSKVV, Gwalior: Dr. Deep Singh Sasode
	AAU, Anand: Dr. D.D. Chaudhari
	MPUAT, Udaipur: Dr. Arvind Verma
	PDKV, Akola: Dr. V.V. Gaud
16:45-17:00 hrs	Remarks by Chairman, Co-Chairman and resource person

27th May, 2023 (Saturday)

TECHNICAL SESSION – III	
Chairman	Dr. Rajender Parsad, Director, ICAR-IASRI, New Delhi
Co-Chairman	Dr. J.S. Mishra, Director, ICAR - DWR, Jabalpur
External Expert	Dr. N.N. Angiras, Professor (Retd.), CSHPKV, Palampur
Rapporteurs	1. Dr. Rabiratna Dash, Principal Investigator, OUAT, Bhubaneswar 2. Dr. Savitha Antony, Assistant Professor, KAU, Thrissur
09:30-10.30 hrs	Release of online data submission module followed by discussion: ICAR-DWR and ICAR-IASRI
10:30-11.45 hrs	Presentation of salient findings by Principal Investigators of Volunteer Centres of AICRP-WM (10 min. for each centre)
	SKUAST, Kashmir: Dr. Ahmad Abdullah Saad
	BUA&T, Banda: Dr. Dinesh Sah
	BAU, Sabour: Dr. Birendra Kumar
	SKNAU, Jobner: Dr. Shweta Gupta
	UAS, Dharwad: Dr. P. Jones Nirmalnath
	ANGRAU, Guntur: Dr. D. Subramanyam,
	PJNCOA&RI, Puducherry: Dr. P. Saravanane
11:45- 12.00 hrs	Remarks by Chairman, Co-Chairman and resource person
	TECHNICAL SESSION – IV

Chairman	Dr. J.S. Mishra, Director, ICAR - DWR, Jabalpur
Co-Chairman	Dr. R. P. Dubey, Principal Scientist & I/C AICRP-WM, ICAR-DWR, Jabalpur
Rapporteurs	1. Dr. (Mrs.) Kamala Bai, UAS, Bengaluru 2. Dr. (Mrs.) Varsha Gupta, RVSKVV, Gwalior
12:00- 13:30 hrs	Interaction with industry Discussion on administrative and financial issues
	Remarks by Chairman and Co-Chairman
13:30- 14:30 hrs	LUNCH BREAK
14:30-16:00 hrs	CONCLUDING / PLENARY SESSION
	Presentation of brief report on technical sessions by the Rapporteurs
	Remarks by Resource persons
	Remarks by Director Research SKUAST, Jammu
	Remarks by Director, ICAR-DWR, Jabalpur
	Remarks by DDG (NRM)/ADG (AAF & CC), ICAR, New Delhi
	Vote of thanks by Dr. B. R. Bazaya, Principal Investigator, SKUAST, Jammu
16:00-17:00 hrs	Visit to experimental fields at university/farmer's fields

XXX Annual Review Meeting
All India Coordinated Research Project on Weed Management
ICAR-Directorate of Weed research, Jabalpur-482004

Venue: Sher-e-Kashmir University of Agricultural Sciences & Technology, Jammu (J&K)
Date : 26-27 May, 2023

LIST OF INVITEES

INDIAN COUNCIL OF AGRICULTURAL RESEARCH, NEW DELHI

1. Dr. Himanshu Pathak Secretary (DARE) & Director General
Indian Council of Agricultural Research
Krishi Bhavan, New Delhi 110 001
2. Dr. S.K Chaudhari Deputy Director General (NRM)
Indian Council of Agricultural Research
Krishi Anusandhan Bhawan-II, Pusa
New Delhi – 110 012
3. Dr. Rajbir Singh Asstt. Director General (Agronomy, AF & CC)
Indian Council of Agricultural Research
Krishi Anusandhan Bhawan-II, Pusa
New Delhi – 110 012

EXTERNAL EXPERT

1. Dr. N. N. Angiras Professor (Retd.), CSKHPKV, Palampur

ICAR-DIRECTORATE OF WEED RESEARCH, JABALPUR

1.	Dr. J. S. Mishra	Director
2.	Dr. R.P. Dubey	Pr. Scientist (Agronomy) & I/C AICRP-WM
3.	Dr. P. K. Mukherjee	Pr. Scientist (Agronomy)
4.	Dr. Shobha Sondhia	Pr. Scientist (Organic Chemistry)
5.	Dr. V.K. Choudhary	Sr. Scientist (Agronomy)
6.	Dr. Yogita Gharde	Sr. Scientist (Agril. Statistics)
7.	Mr. Jamaludheen A.	Scientist, (Agriculture Economics)
8.	Mr. Pankaj Shukla	Asst. Chief Technical Officer

INVITEES FROM AICRP-WM CENTRES

PROFESSOR JAYASHANKAR TELANGANA STATE AGRICULTURAL UNIVERSITY (PJ TSAU), HYDERABAD (TELANGANA)

1. Dr T. Ram Prakash Principal Scientist (Agro.) & Principal Investigator
2. Dr Mrs. B. Padmaja Sr. Scientist (Agro)

ANAND AGRICULTURAL UNIVERSITY, ANAND

3. Mr. D.D. Chaudhari Agronomist & Principal Investigator

TAMILNADU AGRICULTURAL UNIVERSITY, COIMBATORE

- 4 Dr. S. Radhamani Principal Investigator
- 5 Dr. C. Bharathi Jr. Residue Chemist

CCS HARYANA AGRICULTURAL UNIVERSITY, HISAR

- 6 Dr. Todar Mal Poonia Principal Investigator
- 7 Dr. Ankur Chaudhary Assistant Agronomist

RAJMATA VIJAYARAJE SCINDIA KRISHI VISHWA VIDYALAYA, GWALIOR

- 8 Dr. D.S. Sasode Agronomist & Principal Investigator
- 9 Dr. Varsha Gupta Jr. Agronomist

ODISHA UNIVERSITY OF AGRICULTURE & TECHNOLOGY, BHUBANESHWAR

- 10 Dr. R. Dash Agronomist & Principal Investigator
- 11 Dr. Mrs. Ipsita Kar Jr. Agronomist

PUNJAB AGRICULTURAL UNIVERSITY, LUDHIANA

- 12 Dr. M.S. Bhullar Agronomist & Principal Investigator
- 13 Dr (Mrs) Parvinder Kaur Residue chemist

G.B. PANT UNIVERSITY OF AGRICULTURE & TECHNOLOGY, PANTNAGAR (U.P.)

- 14 Dr. T.P. Singh Principal Investigator
- 15 Dr. S.P. Singh Agronomist

CSK HIMACHAL PRADESH KRISHI VISHVA VIDHYALAYA, PALAMPUR

- 16 Dr. S.S. Rana Agronomist & Principal Investigator

KERALA AGRICULTURAL UNIVERSITY, THRISSUR

- 17 Dr. P. Prameela Principal Investigator
- 18 Dr. Savitha Antony Assistant Professor

ASSAM AGRICULTURAL UNIVERSITY, JORHAT

19 Dr. Khagen Kurmi Principal Scientist & Principal Investigator
20 Dr. I.C. Barua Principal Scientist
UNIVERSITY OF AGRICULTURAL SCIENCES, BENGALURU

21 Dr. K.N. Geetha Principal Investigator
22 Dr. (Mrs.) Kamala Bai S. Jr. Agronomist

I.G. KRISHI VISHVA VIDYALAYA, RAIPUR

23 Dr. Shrikant Chitale Senior Scientist & Principal Investigator
24 Dr. Nitish Tiwari Jr. Agronomist

**MAHARANA PRATAP UNIVERSITY OF AGRICULTURE AND TECHNOLOGY,
UDAIPUR**

25 Dr. Arvind Verma Professor (Agronomy) & Principal
Investigator
26 Dr. Roshan Choudhary Jr. Agronomist

DR. PANJABRAO DESHMUKH KRISHI VIDYAPEETH, AKOLA

27 Dr. V.V Gaud Agronomist & Principal Investigator

**SHER-E-KASHMIR UNIVERSITY OF AGRICULTURAL SCIENCES AND TECHNOLOGY,
JAMMU**

28 Dr. B.R. Bazaya Professor (Agronomy) & Principal
Investigator
29 Dr. Ramphool Puniya Asstt. Professor (Agronomy)

BIDHAN CHANDRA KRISHI VISWAVIDYALAYA, KALYANI

30 Dr. Bikas Madal Associate Professor (Agronomy) &
Principal Investigator
31 Dr. Smritikana Sarkar Jr. Agronomist

PRINCIPAL INVESTIGATORS OF AICRP-WM VOLUNTEER CENTRES

**SHER-E-KASHMIR UNIVERSITY OF AGRICULTURE AND TECHNOLOGY - KASHMIR
SHALIMAR, SRINAGAR**

32 Dr. Ahmad Abdullah Saad Principal Investigator

P.J. NEHRU COLLEGE OF AGRICULTURE & RI, KARAIKAL, U.T. OF PONDICHERRY

33 Dr. P. Saravanane Principal Investigator

BIHAR AGRICULTURAL UNIVERSITY, SABOUR, BHAGALPUR (BIHAR)

34 Dr. Birendra Kumar Principal Investigator

UNIVERSITY OF AGRICULTURAL SCIENCES, DHARWAD

35 Dr. P. Jones Nirmalnath Principal Investigator

BANDA UNIVERSITY OF AGRICULTURE & TECHNOLOGY, BANDA, UTTAR PRADESH

36 Dr. Dinesh Sah Principal Investigator

ACHARYA N.G. RANGA AGRICULTURAL, UNIVERSITY, GUNTUR

37 Dr.D. Subramanyam Principal Investigator

Sri Karan Narendra Agriculture University, Jobner

38 Dr. Shweta Gupta Principal Investigator

INVITEES FROM INDUSTRY

- | | |
|---|---|
| 1. President
Dhanuka Agritech Limited
14th Floor, Building 5A, Cyber City, DLF
Phase-III,
Gurgaon – 122 002 Haryana | 2. Managing Director and CEO
PI Industries Limited
ML Batra Enterprises Compound, C – 21,
Meerut Road Industrial Area,
Ghaziabad – 201 003 |
| 3. President
Syngenta India Ltd
Invoicing Processing Cell (CC-4700)
Amar Paradigm, S. No. 110/11/3, Baner
Road, Pune 411045 | 4. Vice President - International Marketing &
Development
Gharda Chemicals Limited
48, Hill Road,
Bandra (West), Mumbai-400 050 |
| 5. Vice President- Public & Government
Affairs
Bayer Crop Science Limited Delta Square,
Ground Floor, Sector-25 M.G Road
Gurgaon – 122002 | 6. ASPEE Group of Companies
4th floor, Aspee House
Aspee Enclave, Opp. I.O.B. Bank
Marve Road, Malad West
Mumbai - 400064 |
| 7. Krishi Rasayan Group
410 & 411, Dev Arcade,
Near Naranpura Rly Crossing,
Naranpura, Ahmedabad-380 013 | 8. Managing Director & CEO
Rallis India Limited, 156/157, 15th Floor,
Nariman Bhavan, 227, Nariman Point,
Mumbai 400 021 |
| 9. Sumitomo Chemical India Pvt. Ltd.
7th, Moti Mahant, 195, J. Tata Road
Churchgate, Mumbai 400020 | 10. General Manager (Research Tech.
Development)
M/s GODREJ AgroVet Ltd.
Pirojshnagar
Eastern Express High Way
Vikhroli (East), Mumbai 400 079 |
| 11. General Manager
ADAMA India Pvt. Ltd.
Located in IKP Knowledge Park, Plot No: | 12. Tropical Agrosystem India Pvt. Ltd.
Jhaver Centre, IV th Floor,
72, Marshalls Road, Chennai, |

- DS -13, IKP Knowledge Park, Sy. No. 542/2, Genome Valley, Turkapally, Shameerpet Medchal-Malkajgiri district, Hyderabad, Telangana, 500101
13. Crystal Crop Protection Limited
B-95, Wazirpur Industrial Area
Wazirpur
New Delhi, Delhi 110052, IN
15. Manager- Company Secretarial
BASF Chemicals India Private Limited
The Capital, A Wing, 1204-C, 12th
Floor, Plot No. C-70 G Block, Bandra Kurla
Complex, Bandra (East) Mumbai Mumbai
City MH 400051 IN.
- Tamilnadu, India 600008
14. UPL Pvt. Ltd.
3-11, G.I.D.C., Vapi, Distt. Valsad, Gujarat
396195 India, Tel. No.: 0260-2432716
16. SWAL CORPORATION LTD.
UPL House, 4th Floor, CTS No. 610B/2,
Bandra Village, Off Western Express
Highway, Behind Teachers Colony, Bandra
(East), Mumbai 400 051.