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कार्यवृत
Proceedings

अखिल भारतीय समन्वित खरपवार प्रबंधन परियोजना
की XXV वार्षिक समीक्षा बैठक

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

स्थान
गोविंद वल्लभ पंत कृषि एवं प्रौद्योगिक विश्वविद्यालय
पंतनगर (उत्तराखंड)

7–8 जून, 2018

Held at

Govind Ballabh Pant University of Agriculture & Technology
Pantnagar (Uttrakhand)

7-8 June, 2018

भा.कृ.अनु.प.–खरपतवार अनुसंधान निदेशालय
जबलपुर–482 004 (म.प्र.)
ICAR-Directorate of Weed Research
Jabalpur - 482 004 (M.P.)
(ISO 9001:2015 Certified)

Proceedings of
XXV Annual Review Meeting
All India Coordinated Research Project on Weed Management
7-8 June, 2018
Govind Ballabh Pant University of Agriculture & Technology
Pantnagar (Uttrakhand)

7 June, 2018

INAUGURAL SESSION

Inaugural session was graced by the presence of Professor A.K. Misra, Vice-Chancellor, GBPUAT, Pantnagar, Dr. J. Kumar, Dean, Collage of Agriculture, GBPUAT; Dr. S. Bhaskar, Assistant Director General (Agronomy, Agroforestry & Climate Change), ICAR, New Delhi and Dr. P.K. Singh, Director, ICAR-DWR, Jabalpur. Dr. D.S. Pandey, Head, Agronomy, GBPUAT; Dr. Shobha Sondhia, I/C AICRP-WM, ICAR-DWR, Jabalpur; Dr. V. Pratap Singh, Principal Investigator, AICRP-WM, GBPUAT, Pantnagar centre. Dr. Govindra Singh, Ex-Prof. & Head Agronomy & Ex-PI, AICRP-WM Dept. of Agronomy, College of Agriculture, GBPUAT, Pantnagar and Dr. J.S. Mishra, Head Division of Crop Research, ICAR Research Complex for Eastern Region, Patna were also present as resource person for this meeting.

The scientists of coordinating centres, volunteer centres, ICAR Institutes, Nodal Officers from ICAR-DWR, Jabalpur, staff of GBPUAT, Pantnagar and representative of herbicide industry (Gharda Chemicals Limited) attended the meeting. After lighting of the lamp by the Chief Guest, Dr. P.K. Singh, Director, ICAR-Directorate of Weed Research, Jabalpur welcomed the Chief Guest and participants during inaugural function and delivered welcome address. In his welcome address Dr. Singh highlighted the role of AICRP-WM in crop and cropping system. He also highlighted losses caused by the weeds to the tune of 10 million dollar annually. Dr. Bhaskar said that agriculture production can be doubled only by control of weeds through integrated weed management. He emphasized for controlling weeds in organic farming for quality agriculture crop production. Chief guest Professor A.K. Misra, Vice Chancellor, GBPUAT, Pantnagar said that various AICRPs have played vital role in agriculture research and enhanced agriculture production which resulted in green revolution in India. During the programme AICRP-WM 'Best Centre Awards for the year 2017-18' was given to PJTSAU, Hyderabad.

In the inauguration ceremony, following publications were released:
"AICRP Weed Management A Profile" by ICAR-Directorate of Weed Research, Jabalpur

"AICRP-Weed Management Annual Report 2017-18" by ICAR-Directorate of Weed Research, Jabalpur

Book "Tropical weeds biology and identification" by C. Chinnusamy *et al.* of TNAU, Coimbatore.

Leaflets on "Weed management in wheat and integrated weed management in *Parthenium*" in Gujrati language by AAU, Anand

Leaflets in hindi for control of weeds in different crops, *viz*. rice, wheat, pulses and oilseeds, mustard, vegetables, cotton and control of *Parthenium* by CCSHAU, Hisar centre.

Vote of thanks was proposed by Dr. V. Pratap Singh, PI, AICRP-WM GBPUAT, Pantnagar centre.

TECHNICAL SESSION - I

Presentation of salient findings of AICRP-WM Centres

Chairman	**:**	Dr. Govindra Singh, Ex. Professor & Principal Investigator, AICRP-WM, GBPUA&T, Pantnagar
Co-chairman	**:**	Dr. R.P. Dubey, Principal Scientist (Agronomy), ICAR-DWR, Jabalpur
Resource person	**:**	Dr. J.S. Mishra, Head, Division of Crop Research, ICAR Research Complex for Eastern Region, Patna
Rapporteurs	**:**	Dr. J. Deka, AAU, Jorhat Dr T. Ram Prakash, PJTSAU, Hyderabad

Dr. Sushil Kumar, Principal Scientist, ICAR-DWR presented the salient research achievements pertaining for the year 2017-18 under five theme areas.

- Paraquat was found to be effective at 750 g to 1000 g/ha to hasten the maturity and pre-harvest defoliation in chickpea crop.
- Application of oxyfluorfen 150 g/ha showed phytotoxicity on greengram upto 10 DAS.
- In biodiversity studies of weedy rice, there was no significant difference among different biotypes at molecular level.
- Resistant biotypes of *Echinocloa colona* and *Commelina benghalensis* to imazethapyr application were noticed.
- Efficient methods were developed for analysis of topramezone and tembotrione, new post-emergence herbicides used in maize.
- Under elevated CO_2 and temperature conditions *Amaranthus viridis* was found to compete with greengram and *Euphorbia geniculata*

Dr. Shobha Sondhia, Incharge AICRP-WM, ICAR-DWR presented the research highlights of the AICRP-WM network experiments and showed continuous progress in research and extension activities and number of publications. She also presented Action Taken Report (ATR) on recommendation and comments made in the XXIV Annual Review Meeting of AICRP-WM organized at MPUAT, Udaipur during February 2017.

Afterwards as per schedule presentation by PIs of AICRP-WM co-ordinated centres were made.

PAU Ludhiana

Dr. M.S. Bhullar, Principal Investigator, presented research highlights of PAU, Ludhiana centre.

- *Portuluca oleraceae*, *Leptocloa chinensis* and multiple herbicide resistant *Phalaris minor* are emerging as problematic weeds in summer vegetables, transplanted rice and wheat crops respectively.
- ZT (R) wheat- ZT- DSR system has recorded lowest density of weeds and low seed bank of *P. minor* and *Rumex* spp under rice-wheat conservation agriculture system.
- Clodinafop propargyl + metribuzin (RM) was found to be very effective in controlling all the herbicide resistant biotypes of *P. minor* in wheat.
- More than 80% mortality of *P. minor* with the application of isoproturon indicated the possible reverse resistance.
- *Brassica rapa* var *toria* was effectively controlled by Napropamide (1125 g/ha)
- Half-life of bispyribac sodium in soil at field capacity was 22-27 days and it was 35-41 days under saturated (submerged) conditions.
- Toxicity of metribuzin + clodinafop propargyl in wheat is limited to 15-20 days when the herbicide is sprayed in lowvolume spray. However, when the spray volume is 150 liters/ha the phytotoxicity is minimized.

Comments

- RFD should be submitted in prescribed format at the earliest
- Information sought by the Directorate should be submitted in time.
- Include short duration variety of greengram (55 days) during summer in rice-wheat-greengram cropping system.
- Specify recommended herbicides along with other weed management practices in different crops.
- Efforts were appreciated for publishing 18 nos. of research publications by the centre.

GBPUAT, Pantnagar

Dr. V.P. Singh, Principal Investigator presented research highlights of GBPUAT, Pantnagar centre:

- In conservation agriculture experiment with transplanted rice (CT)- Wheat (ZT)- *Sesbania* (ZT) treatment was found to record low weed biomass and high yield.
- Extract of the weed *Melilotus indica* restricted growth of *P. minor* to an extent of 36 %.
- *Circium arvense*, late emerging weed in wheat, causes significant losses if not controlled, was found to be controlled effectively with metribuzin + metsulfuron methyl.
- Coldinafop propargyl + metsulfuron methyl combination was found to be very effective for weed management in wheat FLDs.
- Application of bispyribac sodium as early post-emergence in rice resulted higher average yield (6.3 t/ha), higher WCE (35.3 %) compared to pretilachlor or farmers' practice in the FLDs conducted in rice crop.

Comments

- Wheat yields should be reported uniformly in kg/ha.
- Care should be taken to plot the graphs using the independent variable on x-axis.
- RFD report should be submitted in prescribed format at the earliest to the Directorate for compilation and onward forwarding.
- Centre was appreciated for bringing out quality publications.

CSKHPKV, Palampur

Dr. Neelam Sharma, Principal Investigator presented research highlights of CSKHPKV, Palampur centre.

- In conservation agriculture experiment with wheat-maize cropping system, highest wheat equivalent yield (8.2 t/ha) was recorded in ZT-ZT establishment method and adoption of integrated weed management practices in both crops.
- In maize-garlic organic farming system experiment, adoption of raised stale seed bed + mulch resulted in 65 % increase in garlic equivalent yield compared to check.
- Standardized and demonstrated IWM practices in peach orchards which resulted in reduction of weed population diversity to 7 from 33.
- *Erodium cicutarium* in wheat and *Fumarium parviflora* in field crops were found the emerging problematic weeds in Himachal Pradesh.
- Clodinafop propargyl residues in grain samples collected from all the wheat farmers fields was found to be BDL at the time of harvest.

Comments

- Details of FLDs was not provided in the annual report
- Information sought by the Directorate should be submitted in time
- RFD report should be submitted in prescribed format at the earliest to the Directorate for compilation.
- Publish data in good quality journals.

CCSHAU, Hisar

Dr S.S. Punia, Principal Investigator presented research highlights of CCHAU centre.

- Hand-hoeing (thrice at 25, 50, 75) followed by rice straw mulching was found to be effective for weed management in turmeric.
- Aceflourfen sodium + clodinafop propargyl (RM) provided effective weed management in greengram.
- Imazethpayr + imazamox was found to provide broad-spectrum weed control in peas.
- *Parthenium hysterophorus* and *Cannabis sativa* were found to have migrated from non-cropped areas and infesting sugarcane and wheat fields, causing significant crop losses.
- Pendimethalin + metribuzin (TM) at 1500 + 175 g/ha or pendimethalin + pyroxasulfone (1500 + 02 g/ha) followed by sequential use of pinoxaden (60 g/ha)or meso + idosulfuron (RM) 14.4 g/ha at 35 DAS was very effective for weed management in wheat.

Comments

- Overall performance of centre is good.
- Provide summary of salient achievements of the centre in Hindi also.
- Include ZT treatment during *Kharif* and at least green manuring during summer.
- Publish data in good quality journals.

SKUAST, Jammu

Dr B.R. Bazaya, Principal Investigator presented research highlights of Jammu centre.

- In conservation agriculture experiment with rice-wheat-greengram system, ZT (R) wheat- ZT DSR(R)- ZT greengram and adoption of IWM in all the component crops resulted in higher yields and effective weed management.
- Application of mustard seed cake 2.5 t/ha at 10 DBS or 10 DBT followed by one hand weeding resulted in very effective weed management in rice-potato-french bean cropping system.
- Pendimethalin + imazethapyr (RM) pre-emergence application was very effective for weed management inpeas
- Cotton padding with 4.0 g copper sulphate + 0.5 g 2,4-D was very effective for management of *Loranthus* infesting the fruit crops and trees
- *Lolium* was new weed species observed in farmers' fields

Comments

- RFD report should be submitted in prescribed format at the earliest to the Directorate for compilation.
- Information requested by the Directorate should be submitted in time through proper channel.
- Bring out quality publications.

TECHNICAL SESSION - II

Presentation of salient findings of AICRP-WM Centres

Chairman : Dr. S. Bhaskar, ADG (Agro., AF & CC), ICAR, New Delhi
Co-chairman : Dr. V.P. Singh, Head, Agronomy. ISSR-ICAR, Lucknow
Resource persons : Dr. Govindra Singh, Ex. Professor & Principal Investigator, AICRP-WM, GBPUAT, Pantnagar

Dr. J.S. Mishra, Head, Division of Crop Research, ICAR Research Complex for Eastern Region, Patna

Rapporteurs : Dr. B.D. Patel, AAU, Anand
Dr. (Mrs) Parvinder Kaur, PAU, Ludhiana

RVSKVV, Gwalior
Dr. Varsha Gupta, Assistant Professor presented research highlights of Gwalior centre.

- In pearlmillet-mustard-cowpea conservation agriculture (CA) experiment presented weed flora status of experimental field and shift of weed flora
- In CA experiment CT proved better as higher seed and straw yield was observed in CT-CT
- In potato-green gram organic weed management- cropping system two hand weeding at 20 and 40 DAS resulted in higher weed control efficiency
- In mustard integrated weed management (oxyfluorfen and one hand weeding at 25-30 DAS gave maximum seed yield
- No new weed species has been observed
- Biological control of water hyacinth, show good control of water hyacinth by *Neochetina* spp.

Comments
- Changes in weed seed bank dynamics in long term experiments should be observed and reported
- Select best treatment for FLDs in various crops.
- Transformed value of weed data should be provided
- Annual report not prepared as per provided guideline.
- Photographs should have date and time.
- Centre needs improvement.
- All requisite information should be submitted in prescribed format in time to the PC unit .
- Data should be published in quality scientific journals.

AAU, Jorhat
Dr. J. Deka, Principal Scientist & Principal Investigator presented research highlights Jorhat centre.

- Biodegradable film mulching proved better to manage weeds in organic tea and chilli and gave better yield as compared to other treatments
- GA 500 ppm promotes germination of *Mikania* seeds in coffee field which helps to manage weed effectively
- *Cuscuta campestris* severely infested jute crop and *Ludwigia Palviflora* infestation has increased

Comments
- No report regarding *Parthenium* and water hyacinth.
- Select those herbicide for degradation studies which are included in your technical programme
- Provide data on weed shift with reference point.
- Yield data should be provided in t/ha (if yield is more than 1000 kg/ha).
- Suggested to take emerging and important weed species for biology studies.
- Publish data in good quality journals.

OUAT, Bhubaneswar
Dr. M.M. Mishra, Agronomist & Principal Investigator presented research highlights of Bhubaneswar centre

- No change was observed in physico-chemical property in (Rice-maize-cowpea) CA

experiments

- Microbial status did not shown any change after first year in CA experiment
- Application of 1/3 recommended dose of nitrogen through FYM, *dhaincha* and neem cake along with azospirillum and PSB to rice followed by same portion of organics through FYM, vermicompost, neem cake, azobactar and PSB to tomato and lady finger in rice-tomato-okra system resulted in maximum yield
- For *Orobenche* management in brinjal 200 kg/ha neem cake and pendimethalin 1.0 kg/ha as PE was found better
- Tembotrione as POE 125 g/ha was efficient for weed control in maize.

Comments

- Some conclusion should be drawn from CA experiment
- Two factors set of treatments- provide two way tables for better result interpretation
- On which basis/observation it was concluded that *Neochetina* spp. did not survive
- Not conducted WP 1.1.2.
- Centre needs improvement.
- Publication record is very poor and lots of improvement is needed with respect to centre performance.

BCKVV, Kalyani

Dr. Bikas Madal, Associate Professor (Agronomy) & Principal Investigator presented research highlights of Kalyani centre

- Topramezone 25 g/ha + Tembotrione 125 g/ha at 30 DAP found effective in sugarcane
- Higher rice yield was observed in CT

Comments

- Be precise in providing data and follow presentation guidelines
- ATR was not saitisfactory
- Annual report not prepared as per provided guideline
- Centre needs lots of improvement.
- Though, the efforts for publishing 4 nos. of research papers were appreciated, but the centre, still needs improvement.

TECHNICAL SESSION - III

Presentation of salient findings of AICRP-WM Centres

Chairman	**:**	Dr. D.S. Pandey, Prof. & Head (Agronomy), GBPUA&T, Pantnagar
Co-chairman	**:**	Dr. Sushilkumar, Principal Scientist, ICAR-DWR, Jabalpur
Resource persons	**:**	Dr. Govindra Singh, Ex. Professor & Principal Investigator, AICRP-WM, GBPUAT, Pantnagar
		Dr. J.S. Mishra, Head, Division of Crop Research, ICAR Research Complex for Eastern Region, Patna
Rapporteurs	**:**	Dr. S.P. Singh, GBPUA&T, Pantnagar
		Dr. Yogita Gharde, DWR-ICAR, Jabalpur

AAU, Anand

Dr. B.D. Patel, Principal Investigator presented research highlights of Anand centre

- *Argemone mexicana* was found as new emerging weed in different field crops in many

districts of Gujarat.

- In garlic, application of oxyfluorfen 240 g/ha PE *fb* HW at 60 DAP along with paddy straw mulch 5 t/ha was found effective to manage weeds and produce higher garlic bulb yield.
- During the monitoring of weed flora, it was found that *Striga* is not a problem in Central Gujrat.
- Application of atrazine + pendimethalin (500 + 250 g/ha) PE (tank mix) *fb* 2, 4-D 1000 g/ha LPoE was found effective in maize based cropping system.

Comments

- In organic farming experiments, treatments should be included after thorough discussion.
- Data on residue work was not presented.
- Analyze the system productivity
- High dose of vermicompost is included in the experiment than recommended, check it for suitability.
- Publish data in good quality journals.

IGKV, Raipur

Dr. Srikant Chitle, Principal Investigator presented research highlights of Raipur centre

- Under conservation agriculture there is weed shift of annual grassy and broad leaf weeds to perennial weed like *Cynodon dactylon* especially under ZT (DSR) –ZT + R-ZT and ZT (DSR) + R – ZT + R –ZT in rice-wheat-cowpea cropping system in 3 years.
- Significantly higher seed yield of rice was recorded under integrated weed management through oxadiargyl 80 g/ha PRE *fb* hand weeding at 25 DAT/S over recommended practice and unweeded check.
- Among weed management practices, application of oxadiargyl 80 g /ha *fb* bispyribac Na 25 g /ha provided maximum grain yield.

Comments

- Old ATR was presented
- Experiment and programme number should be corrected as per new technical programme.
- Improvement in the data and presentation is required.
- Centre needs improvement.
- Bring out quality publications.

PDKV, Akola

Dr. J.P. Deshmukh, Principal Investigator presented research highlights of Akola centre

- Premix combination of clodinafop + metsulfuron 0.06 + 0.004 kg/ha at 35 DAS was found economically feasible post-emergence herbicides in wheat.
- In turmeric, straw mulch with pendimethalin 1 kg/ha or metribuzin 0.7 kg/ha (0-5 DAP) *fb* straw mulch 10 t/ha (10 DAP) *fb* one HW (75 DAP) was found effective for weed control and highest productivity and profitability were obtained.
- In groundnut, post emergence application of propaquizofop 0.10 kg/ha POE 20 DAS was found effective among all herbicidal treatments.

Comments

- Follow guidelines while presenting the data
- It is not required to perform analysis on economic parameters e.g. net return and B C ratio.
- Overall performance of centre is good.
- Bring out quality publications.

MPUAT, Udaipur
Dr. Arvind Verma, Principal Investigator presented research highlights of Udaipur centre

- In first year of experimentation, marked increase in grain and stover yield of maize was recorded with weed management treatments under conservation agriculture.
- The highest net return and B:C were obtained with soil solarization with plastic mulch in organic farming in sweet corn.
- Post-emergence application of ready mix combination of acifluorfen + clodinafop (RM) applied at 370 g/ha recorded the maximum seed yield (653 kg/ha).
- Application of oxadiargyl at 100 g/ha as pre-emergence followed by one hand weeding at 40 DAS was found more effective in reduction of weed population at all stages.

Comments
- Effects of herbicides were not discussed in succeeding crop.
- Finding should be discussed with two or three major highlights
- It is not required to perform analysis on economic parameters e.g. net return and B C ratio.
- Follow guidelines while presenting the data
- Publish data in good quality journals.

TECHNICAL SESSION - IV

Presentation of salient findings of AICRP-WM Centres

Chairman	**:**	Dr. B. S. Mahapatra, Prof. Agronomy, GBPUAT, Pantnagar
Co-chairman	**:**	Dr. J.S. Mishra, Head, Division of Crop Research, ICAR Research Complex for Eastern Region, Patna
Resource persons	**:**	Dr. Govindra Singh, Ex. Professor & Principal Investigator, AICRP-WM, GBPUAT, Pantnagar
Rapporteurs	**:**	Dr. (Mrs) Neelam Sharma, CSKHPKV, Palampur Dr. I.C. Barua, AAU, Jorhat

PJTSAU, Hyderabad
Dr. M. Madhavi, Principal Investigator presented research highlights of Hyderabad centre

- Among the tillage treatments Conventional Tillage in *Kharif* rice followed by maize under conventional tillage resulted in the best BC ratio as well as net return, and among the weed management practices, net returns and BC ratio and obtained with IWM in conservation agriculture.
- Mulching with polysheet (25 microns)+ HW in the inter row at 30 DAS proved effective followed by cultural practice involving mechanical weeding at 20 & 40 DAS (2631kg/ha) and SSB preparation *fb* HW at 20 & 40 DAS (2513 kg/ha) or pendimethalin 1000 g/ha *fb* HW at 30DAS was found effective for efficient weed control and higher yield in okra.
- *Cyperus rotundus* has been reported as the most dominant weed in organic based pearl millet-groundnut cropping system, followed by *Dactyloctenium aegypticum* at 30 DAS, while *Parthenium hysterophorus* and *Cynodon dactylon* at 60 DAS.
- Residues of pendimethalin in okra fruits and carrot tubers were below the detectable limit of 0.05 mg/kg at the time of harvest.
- Pyrithiobac sodium adsorption was higher in black soil with higher clay content and higher organic matter content compared to the red soil which had relatively lower clay and organic carbon.

Comments

- Annual report not prepared as per provided guideline
- Information sought by the Directorate should be submitted in time
- Efforts were appreciated for publishing 16 nos. of research publications by the centre.

UAS, Bengaluru

Dr. G,N. Dhanapal, Principal Investigator presented research highlights of Bengaluru centre

- Bensulfuron methyl + pretilachlor *fb* triafamone+ ethoxysulfuron and bensulfuron-methyl + pretilachlor *fb* bispyribac-sodium gave good control of weed complex in transplanted *Kharif* rice and direct-seeded rice, respectively.
- In weed management experiment on conservation agriculture was in rice-greengram-rice cropping system. Conventional Tillage *(*Transplanted*)*-ZT-ZT resulted in the best weed management and yield and among the weed management practices, net returns and BC ratio was obtained with IWM (pyrazosulfuron-ethyl 10 WP 25 g/ha – 3 DAP/S *fb* mechanical weeding- passing cono-weeder – 45 DAS/P).
- In the experiment in integrated weed management with pre- and post-emergence herbicides in ginger, application of pre-emergence herbicides followed by hand weeding showed better result in comparison to combinations of pre and post-emergence herbicides.
- *Oxygonum sinuatum* (Polygonaceae), Wavy-Leaf Oxygonum is native to Africa, naturalized in South India and it was reported as a new weed in Bengaluru Rural District in Finger millet crop production.

Comments

- Annual report not prepared as per provided guidelines
- Information sought by the Directorate should be submitted in time
- Follow guidelines while presenting the data
- Publish data in good quality journals.

KAU, Thrissur

Dr. K.P. Prameela, Principal Investigator presented research highlights of Thrissur centre

- Centre found better weed control and B:C ratio with pendimethalin 0.75 kg/ha *fb* imazethapyr 100 g/ha in the experiment in management of weed complex in greengram in rice fallow.
- Polythene mulch gave better weed management (organic) and productivity in brinjal and pineapple

Comments

- Annual report not prepared as per provided guideline
- Information sought by the Directorate should be submitted in time
- Follow guidelines while presenting the data.
- Plan experiments on organic weed management.
- Though, the efforts for publishing 5 nos. of research papers were appreciated, yet more improvement was also needed.

TNAU, Coimbatore

Dr. C. Chinnusamy, Principal Investigator presented research highlights of Coimbatore centre

- In maize – sunflower – *daincha* based conservation agriculture system better WCE & higher productivity were recorded in ZT - ZT + R and PE pendimethalin 1.0 kg/ha + HW 45 DAS in sunflower, CT-CT and PE atrazine 0.5 kg/ha + HW 45 DAS in maize.

- Total bacteria, fungi, actenomycetes and alkaline phosphatase and dehydrogenase were significantly higher in ZT-ZT+R system on par with conventional tillage in CT-CT system.
- Non-chemical weed management practices in organically grown Okra+leaf coriander – maize+cowpea cropping system gave comparatively higher net return with crop residue treatments.
- Application of paraquat 0.750 kg/ha lowered the spread & dry weight of *Cuscuta*.
- In CA under maize-sunflower cropping system, 80 % of both herbicides i.e. pendimethalin and atrazine dissipated from the soil on 45^{th} day.
- Residue of quizalofop-ethyl in tomato fruit and soil at harvest was below detectable level.
- Adsorption of quizalofop-ethyl in sandy clay loam soil fitted well to Freundlich Equation (R^2 = > 0.99)
- FYM and Vermicompost degraded atrazine at very faster rate with a half life of 5.4 and 11 days respectively

Comments

- Information sought by the Directorate should be submitted in time
- Follow guidelines while presenting the data.
- More focus should be given on experiments on organic weed management.
- Publications brough out by the centre was appreciated.

UAS, Dharwad

Dr. P. Jones Nirmalnath, Principal Investigator presented research highlights of Volunteer centre of Dharwad

- In controlling *Striga* in sugarcane field the UASDAMF consortium is found very efficient.

Comments

- Provide the microbial consortium to AICRP-WM centers where S*triga* is a problem in sugarcane.

SKUAST, Kashmir

Dr. Raihana Habib Kant, Principal Investigator presented research highlights of volunteer centre of Kashmir

- Metribuzin + oxyflourfen *fb* metribuzin + oxyflourfen 560+480g/ha proved good for control of weeds in Safforn.

Comments

- Work was appreciated
- Provide detailed report of TSP for the year 2016-17

IVRI, Izatnagar

Dr. P Mukherjee, IVRI, Izatnagar, presented the results of weed management in fodder crops and established on the control by the cultural management practices.

- Sowing of 600 to 800 g/ha seeds of *Brassica napus* with berseem can control the problem of *Coronopus didymus.*

Comments

- Work was appreciated

June 8, 2018

TECHNICAL SESSION - V

Formulation of network Technical Programme for 2018-19 & 2019-20

Chairman	**:**	Dr. Govindra Singh, Ex. Professor & Principal Investigator, AICRP-WM, GBPUA&T, Pantnagar
Co-chairperson	**:**	1 Dr. R.P. Dubey, Principal Scientist (Agronomy), ICAR-DWR, Jabalpur 2 Dr. Shobha Sondhia, I/C AICRP-WM, ICAR-DWR, Jabalpur
Resource persons	**:**	Dr. J.S. Mishra, Head, Division of Crop Research, ICAR Research Complex for Eastern Region, Patna
Rapporteurs	**:**	Dr. V.K. Choudhary, ICAR-DWR, Jabalpur Dr. Diwaker Ghosh, DWR-ICAR, Jabalpur

During discussion centre wise following suggestions were suggested to incorporate in final technical programmer for the year 2018-19 and 2019-20.

WP 1 Development of sustainable weed management practices in diversified cropping systems

WP 1.1 Weed management in conservation agriculture systems

1. Objectives have been change from three to two including resource use efficiency into first objective.
2. Observations: For seed bank study it is suggested to take the depth wise (0-10cm and 10-20 cm depths) soil samples just after summer and before *kharif* season. Minimum of 3 kg soils need to be collected and seed bank study may be conducted in trays.
3. Crop growth parameters may be recorded at 60 DAS/DAT and at harvest.
4. Soil properties may be recorded at initial and alternate cropping cycle. It was also suggested to record dehydrogenase activity at 15 days after herbicide application.

Note: It was suggested to keep one set of treatment as ZT + crop residues throughout the year (probably T5; for the centres involving in WP1.1). All the centers are suggested to mention plot sizes and design of experiment

Suggestion and proposal of different experiments (centre wise):

Bhubaneswar (Odhisa):

- Experiment will be continuing as such.
- The summer crop is cowpea instead of greengram.
- Hand weeding will be done at 30 DAS/DAT

Hisar (Haryana):

- It was suggested to include ZT treatment during *kharif* and at least greenmanuring during summer. But, later it was communicated that DSR in basmati rice is not possible in Hisar.

Hyderabad (Telangana)

- Suggested to include new herbicide in maize (tembotrione at 120 + atrazine 500 g/ha) in place of 2, 4-D.
- Suggested to use glyphosate to control existing weed flora before sowing of crops.

Jammu

- Include imazethapyr at 70-100 g/ha as recommended herbicide treatment.
- Use same herbicide along with one hand weeding as integrated treatment.

Ludhiana

- Include short duration variety of greengram (55 days) during summer in rice-wheat-greengram cropping system.
- Specify recommended herbicides along with other weed management practices in different crops.

Pantnagar

- Remove terminology M1, M2, M4, M5, M7, M10 from tillage and residue management treatment
- Keep three weed management practices including weedy check
- Specify recommended herbicide along with other practices under weed management.

Kalyani

- Use greengram during summer in place of jute.
- Include post-emergence herbicide (Bispyribac-Na) along with pre-emergence in rice for herbicide based weed management treatment (W1).

Coimbatore

- Do not follow hand weeding in *Sesbania*.
- Use 120 g/ha of tembotrione in maize, but as per their findings 100 g/ha of tembotrione is working well in Coimbatore condition.

Palampur

- Use green manure crop as third crop, but they responded that window between wheat and rice is very short, so it's not possible.
- Specify the name of herbicide with dose in W1 and in W2 along with herbicide include one hand weeding in place of mechanical + incorporation.

Udaipur

- In greengram, use sodium acifluorfen + clodinafop (W1) and in integration apply one hand weeding along with W1

Bangaluru

- Suggested to remove T5 and add residue in T2 during *Kharif*.
- In maize (*Kharif* and summer), use new herbicide (tembotrione 120 g/ha + atrazine 500 g/ha) in W1 and tembotrione 120 g/ha *fb* one HW 45DAS
- In greengram, use imazethapyr 100 g/ha at 20 DAS and remove pendimethalin as PE in W1.

Gwalior

- Suggested to use oxyfluorfen 230 g/ha as PE in mustard in place of pendimethalin as W1
- Use pendimethalin + imazethapyr 900 g/ha (PE) in cowpea instead of imazethapyr + imazamox (Pre mix) 80 g/ha PoE as W1.

Akola

- Include wheat in place of chickpea and greengram as third crop in system
- Specify herbicides and dose in different crops

Anand

- Use quizalofop + pyrithiobac (Tank mix) *fb* hand weeding and no interculture operation. It was also suggested to delay the hand weeding instead 30 DAS.
- In greenegram, in W1, use imazethapyr, whereas, in W2 pendimethalin *fb* hand weeding

WP 1.2 Weed management in organic farming system

- In organic experiments it was suggested to test the recommended practice (chemical based) in separate strip just for comparison, however, it would not be included for statistical analysis. It also suggested to specify the source of plant nutrients supplying to the crop

Anand

- Use lesser quantity of mulch materials, Increase the plot sizes, specify source of nutrients and number of observation may also be increased.

Bhubneshwar

- Include different weed management treatments and specify the nutrient source

Gwalior

- Use pearlmillet (*Kharif*)-potato (*Rabi*)- greengram (summer) cropping system
- exclude weed mulch as treatment

Hyderabad

- Specify which straw mulch are being included in treatments
- Arrange proper treatment sequence during both the season

Jammu

- Suggested to do proposed experiment as station trial

Jorhat

- Drop the experiment in organic chilly

Palampur

- Modified the treatments

Pantnagar

- Exclude soil solarization in transplanted rice (T3)

Udaipur

- Use 5 tons of straw mulch

Bangaluru

- Revise the complete programme and specify the treatment as per cropping system

Kalyani

- Emphasize on weed management treatments and accordingly revise the programme

1.3. Herbicidal control of weeds in crops and cropping system

Jorhat

- Use bispyribac Na in place of 2, 4-D and change the design in factorial RBD (nutrient source in Factor A and weed management practice as Factor B in 1.3.1.2)
- Take experiment 1.3.2.1 (I & II) as station trial and include bispyribac Na as post-emergence herbicide

Thrissur

- Include weedy plot as one of the treatment

Jummu

- Drop this experiment (WP 1.3.2.2) and may be taken as station trial. The doses of herbicides in rice may be rechecked.

Ludhiana

- Take proposed experiments as station trial [WP 1.3.3.1 (i) & (ii)]

Pantnagar

- Take WP 1.3.3.2 experiment as station trial

1.3.4 Network project in maize-based cropping system

Akola, Bhubneswar, Kalyani and Udaipur

- Maize experiment may be taken as network project, Anand centre requested not to continue this trial.
- In T10 it was suggested that the dose of tembotrione + atrazine will be (120+500 g/ha)
- Suggested to specify sequential crop with treatment details (with 12 treatments detail) in maize based cropping system of respective centres

Jammu

- Drop the WP 1.3.4.2 experiment

WP.1.3.5 Weed management in other cropping systems

Raipur

- Take the weed observation in experiment under IFS.

Gwalior

Drop the WP 1.3.6 experiment

Akola

- Suggested not to include treatment 8 and dose of Na- acifluorfen may be reduced to 225 g/ha and topramezone to 33.6 g/ha in WP1.3.7.1

Bangaluru

- Take WP 1.3.8.1 (Little millet), as station trial based on the results of previous year experiment may be revised for ginger.

WP 1.3.10 Weed management in potato

Ludhiana

- Take WP 1.3.10.1 experiment as station trial.

Bhubneshwar

- Take this in organic farming experiment after revising the treatments (including intercropping and interculture operations).

Ludhiana

- Take WP 1.3.11.1 in onion as station trial.

WP 1.3.13 Weed management in cotton

Akola

- Include directed spray of paraquat for clarity and also suggested in W3 to imply hand weeding after 30 days after paraquat application.

WP 1.3.14 Weed management in sugarcane

Hisar, Ludhiana, Pantnagar

- Ludhiana centre requested to discontinue the experiment in sugarcane.
- Kalyani centre will take this experiment as network project from 2019 onwards.

WP 1.4 Improving input-use efficiency through weed management

Jorhat

- Suggested to take as a station trial (WP 1.4.1).

WP 1.5 Station trials on weed management

Akola

- Suggested to take WP 1.5.1 (i) under conservation agriculture trial only.
- Maize experiment may be taken as network project (WP 1.3.4).

Anand

- Anand centre requested to continue WP 1.5.2 (i) experiment only in groundnut.

Udaipur

- Maize experiment may be taken as network project (WP 1.3.4).
- Suggested to conduct carry over effect of herbicides using in Isabgol, in any prevailing cropping system.

Jammu

- Jammu centre requested to continue WP 1.5.4 (i) as station trial.
- Monitor the weed flora in IFS trials [WP 1.5.4 (ii).

Bhubneshwar

- Maize experiment may be taken as network project (WP 1.3.4).

Kalyani

- modify the treatment combination and use appropriate dose of herbicide.
- Maize experiment may be taken as network project (WP 1.3.4).
- WP 1.5.7 an experiment in turmeric will be conducted at Palampur centre.

WP 2. Weed dynamics and management under the regime of climate change and herbicide resistance

Hisar

- Suggested to drop the experiment under WP 2.3.1 (iii and iv).

Raipur

- Suggested to take WP 2.3.3 as station trial.

Jorhat

- Suggested to drop bio-prospecting experiment and determination of weed competition ability of rice varieties.

WP 3 Biology and management of problem weeds in cropped and non-cropped areas

WP 3.1 Suggested to take emerging and important weed species for biology study.

Raipur, Hyderabad, Udaipur

WP 3.2 Management of problematic weeds

Management of *Orobanche* in brinjal/tomato

Bhubneshwar, Hisar, Udaipur, Hyderabad

- Suggested to drop oxyfluorfen treatment from tomato in WP 3.2.1 (a).

Management of *Cuscuta* in onion

Bangaluru and Anand

- Delete butachlor (T2).
- Add (i) pendimethalin 0.75 kg/ha as pre-emergence and (ii) imazethapyr 75 g/ha as post emergence treatment separately.

Raipur and Jammu center *Cuscutta* management in berseem and suggested to revise the treatment details.

Pantnagar

- Use pendimethalin + metribuzin instead pendimethalin alone.

Thrisur

- Formulate the experiment (WP 3.2 in *Sacciolepis interrupta*) combine the PRE and Post emergence herbicide.

WP 4 Monitoring, degradation and mitigation of herbicide residues and other pollutants in the environment

WP 4.2 Herbicide residues in high-value crops/organic farming system (newer products and combination formulations)

Ludhiana, Palampur, Hyderabad and Coimbatore

- Take soil and plant samples at harvest from ongoing experiments for residue status

WP 4.3 Adsorption, degradation (new molecules only) and mitigation of selected persisting herbicides

- Study mitigation of problematic residual herbicides only.

WP 4.4 Testing of persistence of herbicides in the farmers' field (soil, water and crop produce)

- Take soil and plant samples at harvest from farmers' field for residue status.

WP 5 On-farm research and demonstration of weed management technologies, their adoption and impact assessment

WP 5.1 On-Farm Research (OFR)

Common suggestions for all the centres

- Take minimum of 3 treatments including one as farmers practice in OFR trials
- Specify the farmer's practice (including the detail of weed management activities)
- Mention number and location of OFR.

Bangaluru

- Specify in which districts the OFR will be conducted.

Hisar

- Ten OFR will be conducted in herbicide resistance *P. minor* in farmers field.
- WP 5.1.2 Hisar centre propose to drop the OFR on control of complex weed flora in transplanted rice

Raipur

- Four nos. of OFR on rice and chickpea will be conducted along with farmers practice.

Ludhiana

- Send treatment details in maize and wheat OFR after discussion at PAU.

Udaipur

- Specify the crop and number of OFR in management of *Orobanche*

Pantnagar

- Suggested to incorporate treatment details in rice and wheat.

Thrissur

- Mention doses of herbicide under OFR treatments.

Kalyani

- Specify the crop and number of OFR.

WP 5.2 Front Line Demonstration (FLD)

Common suggestions for all the centres

- In FLD's compare the best weed management treatment with farmers practice (Two treatments only)
- Specify the farmer's practice (including the detail of weed management activities)
- Mention the number and location of FLD.

Anand

- Check the dose of herbicides.
- Select best treatment for FLDs in various crops.

Gwalior

- Select best treatment for FLDs in various crops.

Jammu

- Include farmers practice with detail in different crops and number of FLDS in each crop.

Hisar

- WP 5.2. 2 FLD in maize will be conducted in 10 farmers' field.
- Proposed to do 10 FLDs in sugarcane with halosulfuron + metribuzin.

Hyderabad

- Formulate and send the treatment in various crops along with number of FLDs.

Udaipur

- Compare the proposed treatment along with farmers practice.
- Dose of propaquizafop may be rechecked.

Palampur

- Proposed to conduct FLD's in rice and wheat.

Pantnagar

- Proposed to send the details of FLD in different crops and numbers.

Raipur

- Compare the best treatment with farmers practice.

TECHNICAL SESSION–VI

Farmers interface meeting

Chairman	**:**	Dr. P.K. Singh, Director, ICAR-DWR, Jabalpur
Co-chairman	**:**	Dr. V. Pratap Singh, Professor and PI, GBPUA&T, Pantnagar
Resource persons	**:**	Dr. D.S. Pandey, Professor and Head, Department of Agronomy, College of Agriculture, GBPUAT, Pantnagar
Rapporteurs	**:**	Dr. Arvind Verma, MPUAT, Udaipur Dr. J.P. Deshmukh, PDKV, Akola

The farmers of different districts of Uttarakhand along with persons from herbicidal industries attended the meeting. At the outset Dr. P.K. Singh welcomed the farmers and industrial persons gathering in the meeting and briefed about the Annual Review Meeting of Weed Management and deliberate the ideas of weed management outcomes emerged out by different coordinating centres that representing different parts of the country. He further said that all the scientists of weed management team are working with their expertise to increase the income of farmer and Government of India is also worried about increase of farmers' income. He said that manual weeding of one acre costing about Rs.2500- 3000 but he mange weed scientifically by herbicide the cost can be reduced to 700-800 per acre, further by taking care of critical period of crop weed competition and keeping the crop weed free during the period a farmer can increased their income.

He said that DWR is working for benefit of the farmers. He emphasized that chemical should be applied in respect to dose, concentration, time and stage of application for the effective control of weeds only after technical advice by the scientists or subject expert. Farmer should be aware about the technical name of the chemicals which he required and should be purchased from reputed dealer with proper bill. Dr. Singh thoroughly discussed that all the safety measures are to be adopted by the farmers at the time of herbicide application.

Farmers of Uttarakhand introduced themselves and shared their experiences in the meeting.

Mr. Surjeet Dabar, from Gadarpur, Udham Singh Nagar raised problem of weed management in Wheat. Mr. Dharmveer Singh, Bahedi, U.P., raised the problem of availability of new implements for the weed management in their region. He also discussed problem of weed in transplanted paddy. Dr. V. P. Singh explained the nature of weed problem raised by the farmers and gave them all possible herbicidal combinations for their problem.

Mr. Mahendra Singh, field assistant, Pantmnagar, raised the problem of compatibility of herbicidal mixture. He requested for literature to use application technique of different herbicides and other chemicals like insecticide, fungicide, liquid fertilizers in one spray. Dr. V. P. Singh provided him small literature for it. Another group of farmers raised the problem of weed management in chickpea, Dr. P. K. Singh advised them to use suitable herbicides like Stomp extra as a pre-emergence in chickpea as it is capsulated herbicide and works very effectively in low moisture condition for long time. He also suggested that clodinafop can also be sued especially for the grassy weeds control in chickpea.

Dr. P. K. Singh, informed about mobile application – 'DWR Weed Manager' developed by ICAR-DWR as a ready a reckoner. At the end Dr. V. P. Singh gave vote of thanks to the farmer and industrial person.

PLENARY SESSION

Chairman : Dr Jitendra Kumar, Dean, College of Agriculture
Co-chairman :

In the plenary session felicitation was given to retiring colleagues of AICRP-WM, Dr C. Cinnaswamy, PI AICRP-WM TNAU centre and D Pramela, AICRP-WM, KAU, centre. General issues related to weed management and financial issues were discussed. Dr Singh informed the house that as such no fund is given by the ICAR under instruments. Hence, do quality experiments with innovative ideas. It was also suggested that chemical treatment should be kept as check in organic weed management experiments. Sufficient budget under recurring contingency is being given by the head quarter and remaining by the university should be utilized wisely. Dr. P.K. Singh asked for availability of chemical control for chickpea and lentil. He also informed to the house that provision was made to hire one skilled person well acquainted in weed science subject in each centres. He also said that weed management techniques should be cost effective and ecosystem should be balanced. Dr Jitendra advocated important role of various AICRPs in the country for. Meeting was ended with proposal of vote of thanks by Dr Shobha Sondhia, In-charge, AICRP-Weed Management.

General observations

- In all photographs date and time should be given.
- All data provided in report/presentation should be statistically presented and verified properly.
- Follow provided guidelines while preparing annual report and presentation.
- Compile data on dominant cropping systems of all centers under CA experiment as 3-4 years/cycles completed.
- Pay intensive effort on organic weed management to all the centers of the project.
- Bring out quality publications
- Develop Mobile App in regional language
- Timely supply required data/information.

Dr Shobha Sondhia
Incharge, AICRP-Weed Management

Dr P.K. Singh
Director, ICAR-DWR, Jabalpur

XXV ANNUAL REVIEW MEETING OF
ALL INDIA COORDINATED RESEARCH PROJECT ON WEED MANAGEMENT

ICAR - DIRECTORATE OF WEED RESEARCH, JABALPUR

7-8 JUNE, 2018

VENUE: GOVIND BALLABH PANT UNIVERSITY OF AGRICULTURE & TECHNOLOGY, PANTNAGAR (UTTARAKHAND)

PROGRAMME

June 7, 2018 (Thursday)

0830-0930 hrs **REGISTRATION**

0930-1100 hrs **INAUGURAL SESSION**

Welcome address	**:**	Dr. P.K. Singh, Director, ICAR-DWR, Jabalpur
Address by ADG (Agro., AF & CC), ICAR, New Delhi	**:**	Dr. S. Bhaskar, ADG (Agro., AF & CC), ICAR, New Delhi
Salient research achievements of ICAR-DWR during 2017-18	**:**	Dr. Sushil Kumar, Principal Scientist, ICAR-DWR, Jabalpur
Salient achievements of AICRP on Weed Management	**:**	Dr. Shobha Sondhia, Incharge, AICRP-Weed Management
Address by Chief Guest	**:**	Professor A. K.Mishra, Vice-Chancellor, GBPUA&T, Pantnagar
Vote of thanks	**:**	Dr. V. Pratap Singh, Principal Investigator, GBPUA&T, Pantnagar
1100-1115 hrs	**TEA BREAK**	
1115-1330 hrs	**TECHNICAL SESSION – I**	
	Presentation of Action Taken Report of previous Annual Review Meeting by Dr. Shobha Sondhia	
	Presentation of salient findings by Principal Investigators of AICRP-WM centres	
Chairman:	Dr. Govindra Singh, Ex. Professor & Principal Investigator, AICRP-WM, GBPUA&T, Pantnagar	
Co-chairman:	Dr. R.P. Dubey, Principal Scientist (Agronomy), ICAR-DWR, Jabalpur	
Resource Person	Dr. J.S. Mishra, Head, Division of Crop Research, ICAR Research Complex for Eastern Region, Patna	
Rapporteurs	Dr. J. Deka, AAU, Jorhat Dr. T. Ram Prakash, PJTSAU, Hyderabad	
	PAU, Ludhiana	
	GBPUAT, Pantnagar	
	CSKHPKV, Palampur	
	CCSHAU, Hisar	
	SKUAST, Jammu	

1330-1430 hrs	**LUNCH BREAK**

1430-1545 hrs	**TECHNICAL SESSION – II** **Presentation of salient findings by Principal Investigators of AICRP-WM centres**
Chairman:	Dr. S. Bhaskar, ADG (Agro., AF & CC), ICAR, New Delhi
Co-chairman:	Dr. V.P. Singh, Head, Agronomy. ISSR-ICAR, Lucknow
Resource Person	Dr. Govindra Singh, Ex. Professor & Principal Investigator, AICRP-WM, GBPUAT, Pantnagar
Resource Person	Dr. J.S. Mishra, Head, Division of Crop Research, ICAR Research Complex for Eastern Region, Patna
Rapporteurs	Dr. B.D. Patel, AAU, Anand Dr. (Mrs) Parvinder Kaur, PAU, Ludhiana
	RVSKVV, Gwalior
	AAU, Jorhat
	OUAT, Bhubaneshwar
	BCKV, Kalyani
1545-1600 hrs	**TEA BREAK**
1600-1645 hrs	**TECHNICAL SESSION – III** **Presentation of salient findings by Principal Investigators of AICRP-WM Centres**
Chairman:	Dr. D.S. Pandey, Head, Deptt. of Agronomy, GBPUA&T, Pantnagar
Co-chairman:	Dr. Sushilkumar, Principal Scientist, ICAR-DWR, Jabalpur
Resource Person	Dr. Govindra Singh, Ex. Professor & Principal Investigator, AICRP-WM, GBPUA&T, Pantnagar
Resource Person	Dr. J.S. Mishra, Head, Division of Crop Research, ICAR Research Complex for Eastern Region, Patna
Rapporteurs	Dr. S.P.Singh, GBPUA&T, Pantnagar Dr. Yogita Gharde, ICAR-DWR, Jabalpur
	AAU, Anand
	IGKV, Raipur
	PDKV, Akola
	MPUAT, Udaipur
1645-1745 hrs	**TECHNICAL SESSION –IV** **(Presentation of salient findings by Principal Investigators of AICRP-WM Centres and Volunteer centres)**
Chairman:	Dr. B. S. Mahapatra, Prof. Agronomy, GBPUAT, Pantnagar
Co-chairman:	Dr. J.S. Mishra, Head, Division of Crop Research, ICAR Research Complex for Eastern Region, Patna
Resource Person	Dr. Govindra Singh, Ex. Professor & Principal Investigator, AICRP-WM, GBPUAT, Pantnagar
Rapporteurs	Dr. (Mrs) Neelam Sharma, CSKHPKV, Palampur Dr. I.C. Barua, AAU, Jorhat
	PJTSAU, Hyderabad
	UAS, Bengaluru
	KAU, Thrissur

	TNAU, Coimbatore
	Presentation by volunteer centres and ICAR institutes

June 8, 2018 (Friday)

0930-1200 hrs		**TECHNICAL SESSION –V** **Formulation of network Technical Programme for 2018-19 & 2019-20)**
Chairman:		Dr. Govindra Singh, Ex. Professor & Principal Investigator, AICRP-WM, GBPUA&T, Pantnagar
Co-chairperson:		1-Dr. R.P. Dubey, Principal Scientist (Agronomy), ICAR-DWR, Jabalpur 2- Dr. Shobha Sondhia, I/C AICRP-WM
Resource Person		Dr. J.S. Mishra, Head, Division of Crop Research, ICAR Research Complex for Eastern Region, Patna
Rapporteurs		Dr. V.K. Choudhary, ICAR-DWR, Jabalpur Dr. Diwaker Ghosh, ICAR-DWR, Jabalpur
Dr. R.P. Dubey	:	Weed management in crops and cropping systems
Dr. Bhumesh Kumar	:	Weed survey / surveillance, physiological and climate change studies
Dr. Sushil Kumar	:	Biological weed control and Parasitic weed management
Dr. Shobha Sondhia	:	Herbicide residues
Dr. V.K. Choudhary	:	On-farm research and frontline demonstrations
1130-1145 hrs		**TEA BREAK**

1200-1330 hrs	**TECHNICAL SESSION – VI** **Farmers interface meeting**
Chairman:	Dr. P.K. Singh, Director, ICAR-DWR, Jabalpur
Co-chairman:	Dr.V.P. Singh, Professor and PI, GBPUA&T, Pantnagar
Resource Person	Dr. D.S. Pandey, Professor and Head, Department of Agronomy, College of Agriculture, GBPUAT, Pantnagar
Rapporteurs	Dr. Arvind Verma, MPUAT, Udaipur Dr. J.P. Deshmukh, PDKV, Akola
1330-1430 hrs	**LUNCH BREAK**
1430-1700 hrs	**CONCLUDING / PLENARY SESSION (Presentation of summary recommendations)**

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

Venue : Govind Ballabh Pant University of Agriculture & Technology, Pantnagar (Uttarakhand)
Date : 7-8 June, 2018

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6.	Dr. SushilKumar	Pr. Scientist (Entomology)
7.	Dr. Bhumesh Kumar	Pr. Scientist (Plant Physiology)
8.	Dr. V.K. Choudhary	Scientist (Agronomy)
9.	Dr. Dibakar Ghosh	Scientist (Agronomy)
10.	Dr. Yogita Gharde	Scientist (Agril. Statistics)
11.	Mr. Sandeep Daghat	Asstt. Chief Technical Officer
12.	Mr. Pankaj Shukla	Sr. Technical Officer
13.	Mr. O.N. Tiwari	Sr. Technical Officer

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15.	Dr T. Ram Prakash	Jr. Residue chemist

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20.	Dr. S.S.Punia	Sr. Agronomist & Principal Investigator
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32.	Dr. J. Deka	Principal Scientist & Principal Investigator
33.	Dr. I.C. Barua	Principal Scientist, Ecology,

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34.	Dr. G.N. Dhanapal	Professor (Agronomy) & Principal Investigator
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53.	Dr. S.K. Guru	Professor, Plant Physiology
54.	Dr. S.K. Lokendra	Professor
55.	Dr. J.P. Jaiswal	Professor
56.	Dr. Mahendra Singh Pal	Professor (Agronomy)
57.	Dr. Sumit Chaturvedi	Asstt. Professor (Agronomy)
58.	Dr. V.C. Dhyani	Asstt. Professor (Agronomy)
59.	Dr. Biswajit Pramanide	Asstt. Professor
60.	Dr. P.C. Pandey	Professor, Agronomy
61.	Dr. Ajay Kumar	Asstt. Professor (Agronomy)
62.	Dr. S.K. Yadav	Asstt. Professor (Agronomy)
63.	Dr. Amit Keshrwani	Asstt. Professor (Agronomy)
64.	Dr. P.C. Srivastava	Professor & Head, Soil Science
65.	Dr. Kamendra Singh	Professor
66.	Dr. Salil Tewari	Professor
67.	Dr. Rohitashwar Singh	Professor, Agronomy
68.	Dr. Dhanjay K. Singh	Professor, Agronomy

69.	Dr. J.P. Jaiswal	Professor
70.	Ms. Soniya Saini	Ph.D Scholar
71.	Mr. Sirazuddin	Ph.D Scholar
72.	Dr. Pooja Gangwar	Ph.D Scholar
73.	Dr. Neeta Tripathi	SRF, Agronomy
74.	Mr. Nadeem Idrisi	SRF, Agronomy
75.	Mr. Dinesh Kr. Singh	JRO, Agronomy
76.	Dr. Devendra Singh	Sr. Technical Assistant, Agronomy
77.	Dr. S.K. Jain	Sr. Technical Assistant, Agronomy
78.	Dr. Dalchand	Sr. Technical Assistant, Agronomy
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81.	Dr. P. Jones Nirmalnath	Professor (Agril. Microbiology)

FROM ICAR INSTITUTES

82.	Dr. V.P. Singh	Principal Scientist ICAR-ISSR, Lucknow (U.P.)
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OTHER INVITEES FROM STATE AGRICULTURE UNIVERSITIES

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85.	Dr. Jagdish Prasad Asstt. Microbiologist	CCS Haryana Agricultural University, Hisar, Haryana
86.	Dr. Ekta Joshi Scientist, Agronomy	IGKV, Raipur

FROM INDUSTRY

87.	Mr. M.A. Nihal	Zonal Manager, Gharda Chemical, Lucknow (U.P.)

FARMERS

88.	Mr. Surjeet Dabar	Gadarpur, Udham Singh Nagar
89.	Mr. Dharmveer Singh	Bahedi, U.P.
90.	Mr. Sumit Gangwan	Ajeetpur
91.	Mahendra Singh	Kashipur
92.	32 more farmers	From different villages of Haldwani and Rudrapur District of Uttrakhand