

**Proceedings of the Interface meeting of Directors and Project
Coordinators of Crop Science and Horticulture Divisions at Directorate
of Weed Science Research, Jabalpur**

17 May, 2010

The Interface meeting was inaugurated and chaired by Dr S. Ayyappan, Secretary, DARE and Director-General, ICAR. Dr S.K. Dutta, Deputy Director General (Crops), Dr H.P. Singh, Deputy Director General (Horticulture), Dr K.D. Kokate, Deputy Director General (Extension), Dr G. Kalloo, Vice-Chancellor, JNKVV, Dr T.P. Rajendran, Assistant Director General (Plant Protection), Directors and Project Coordinators of Crop Science and Horticulture Divisions, Dr Jay G. Varshney, Director and Scientists of DWSR attended the meeting.

At the outset Dr Jay G. Varshney, welcomed the Director-General (ICAR) and all senior officers from ICAR HQ and the participating scientists. The Director General also released a publication “**DWSR – Marching ahead**”.

In his welcome address, Dr. Jay G. Varshney presented a detailed account of weed management scenario in the country. He covered the different aspects of weed problems, challenges, priorities, *vis-à-vis* research achievements and for future research priorities. Dr. Varshney, pointed out that the potential crop loss due to weeds per year comes to about Rs 1000 billion in field crops, *albeit* the fact that accurate studies based on crop-competition and other related factors need to be done for all agro-ecologies. He said that the gap between demand and production of agricultural commodities can be minimized by checking the loss due to weed infestation. He explained the challenges to suppress weeds such as due to invasive alien weeds, adverse effects of herbicides to agricultural ecologies, weed shift and climate change. He also explained the utility of herbicide tolerant GM crop, biological control of weeds, and the exploitation of weeds for useful purposes. He emphasized that the most important thing is to raise the awareness on efficient weed management strategies among farmers, under the given constraints of villages and the transfer of such technology to farmers' fields through regular farmers' field school system. To meet these challenges, DWSR has set priorities in research work. Those priorities are development of weed management technologies, with emphasis under moisture stress condition, management of aquatic weeds, altered weed biology out of perceived climate change, weedy rice and threats out of quarantine weeds.

Dr. G. Kalloo in his address suggested adoption of direct seeded rice with suitable crop variety like *Pusa Sugandha* which can impart allelopathic effect toward weed suppression. For efficient weed management one should have proper understanding of the seed biology of weeds. He further emphasized on the study of the dormancy issues of the weed seeds. Dr. H.P. Singh opined to reassess the extent of damage caused by weeds. He was critical of using Mexican beetle and its efficiency for *Parthenium* control. He asked for greater efforts in passing recommendations onto farmers' field. Dr. S.K. Dutta elaborated on the large scope for developing Herbicide Resistant Crops as

there is no risk of gene flow in cross-pollinated crops. Dr K. D. Kokate emphasized that weed management recommendations should be simplified involving the cultural practices, crop rotation, suppression of weeds by other weeds, the use of pests and diseases of weeds and weed management strategies in rainy seasons when access to fields for timely operations is extremely difficult. Dr. H. S. Gupta Director, IARI, showed concern on availability of spurious formulation of herbicides in the market. He has given emphasis on the synthesis of new herbicide molecules in collaboration with institutes such as IARI. Dr. T.P. Rajendran expressed concern about spurious herbicides. He suggested to develop easy techniques for the identification of spurious herbicides. Scientists should design suitable techniques to identify the genuine herbicides for farmers' to practise. They may go for public-private partnership research to garner capabilities in this regard. Dr. S. Ayyappan, Director General in his inaugural address expressed his concern over data showing huge yield losses due to weeds. He was concerned about the high extent of infestation of weeds by citing examples of submerged weed infestation in Dal Lake and Loktak Lake, causing hindrance to inland fisheries. He praised the awareness campaign made by DWSR citing the example of the books on Success Story in English as well as in Hindi. He justified the interface meeting as it would provide scientists to interact to know the real picture of weed problem and its management finally, put forth a suggestion to reconsider the name of DWSR so as to encompass weed management research.

Presentations by Directors and Project Coordinators

Dr T.K. Adhya, Director, Central Rice Research Institute, Cuttack presented "Weed Management in Rice : important issues".

He gave emphasis on the seed selection, soil solarisation during off season, and other phytosanitary measure to reduce weed seed bank, selection of right cultivar (*viz.* Vanadna) having weed competitiveness and allelopathic effects, proper crop management with split application of fertilizers, alternative weed management (fingerweeder and Cono weeder), weedy rice, use of low dose herbicides and mixed formulations. His future strategies are to develop herbicide resistant rice varieties, botanical herbicides and other biological weed management practices. A new weed species, "Horse nettle" was identified in Orissa. He explained the activities of National Invasive Weed Surveillance (NIWS) in the state.

Dr. G. Kalloo wanted to know about the type of rice in relation to weed infestation and the use of herbicides. According to Dr. Adhya there are no statistical differences in weed infestations in SRI and transplanted rice. He mentioned low dose herbicides like azimsulfurom, bensulfuron methyl as effective tools for weed management in SRI. Pretilachlor did not show as good result in farmers' field as in institute's trial. Dr. T.P. Rajendran wanted to know about the botanical sources of weed killing agents. According to Dr. Adhya, the work is in progress. They are now standardizing the doses of extracts. Director, IARI, wanted to know about the efficient implements for weeding. Dr. Sanjay Saha of CRRRI discussed the Cono and Finger weeders.

Dr. Varshney wanted to know about suitable variety. According to Dr. Adhya, Vandana is the ruling variety.

Deputy Director General (Crops) : Fractionate compounds from botanical extracts, characterize it and check the bio-efficacy against target weed species

Deputy Director General (Hort): Institute's work should be based on basic ideas like isolation and characterization of compounds and screening the active one out of them. 2,4-D should not be recommended as it has residue problems.

Dr B.C.Viraktamath, Director, DRR: "Weedy Rice" was a topic discussed in parliament. He suggested developing a collaborative project on survey of weedy rice infestation and its management.

Director, IARI: Why so many herbicides are recommended for a crop? Maximum 4-5 options should be given to farmers.

Director, DWSR: Those herbicides are already registered with specific label claim to those crop species. So, there is no problem to recommend.

Asst DG (PP): The herbicides should be recommended considering their cost and bio efficacy in various agro-ecologies. Specific comparative evaluations regarding suppression of key weeds of a given cropping system may be taken up by DWSR.

Deputy Director General (Extension): Recommendations should be zone specific.

Dr P. Ananda Kumar, Director, NRC for Plant Biotechnology, made a presentation on herbicide tolerant crops. He opined that an appropriate policy should be decided at the earliest on the matter of GM crops keeping in mind the possibility of private companies monopolizing the entire seed sector of important crops.

Dr. Jay G. Varshney showed his anxiety of HTGM rice in view of country already faced with weedy rice Dr. B. C. Viraktamath agreed with Dr. Varshney against the development of HTGM Rice.

Dr O.M. Bambawale, Director, NCIPM, presented "Weeds as reservoir of pests".

Discussion: Deputy Director General (Hort) remarked that in order to maintain the ecological balance weeds should not be eradicated from the system.

Dr R.J. Rabindra, Director, National Bureau of Agriculturally Important Insects, presented the Strategies in classical biological control of weeds in India.

Discussion: Dr Rabindra gave emphasis on the specificity of the biocontrol agents citing the example of sunflower-*Zygogramma* case and on the banning of import of food grains containing weed seeds.

According to Dr. Varshney, import of foodgrain without any weed seed is not possible since there is always a minimum permissible limit for import and export of food grains, set by the various agencies.

Dr. Rabindra further asked for intervention of Council at higher level for release of successful bio-control agent identified by NBAII against *Mimosa* spp. in Kaziranga National Park.

Dr K. K. Sharma, Network Coordinator, All India Network Project on Pesticide Residues, presented the Pesticide Residues Research and Monitoring in India.

Discussion: According to Dr. Varshney, there should be collaboration pertaining to herbicide residues among different organizations involving DWSR.

Dr. T.P. Rajendran was positive about the collaboration. He further added that there should be a setup for constant monitoring of the herbicide-crop interaction. During this discussion he raised the issue of isoproturon resistance. According to Dr. Varshney, the problem has been blown out of proportions. He said that though the problem of herbicidal resistance to isoproturon cannot be ruled out, but non-effectiveness of herbicide is due to spurious herbicides.

Dr Narendra Kumar, Senior Scientist, Indian Institute of Pulses Research, presented the problems, issues and recommendations of weed management in pulses.

Discussion: Dr. Anil Dixit, DWSR mentioned that the dose of imazethapyr used in the experiments was very low, and much lower than the recommended dose. At this dose any kind of control is not possible. Dr. Rajendran was also of the same opinion. DG asked about the recommendation of the weed *bathua* in gram. Dr. Varshney suggested that pendimethalin is the most appropriate herbicide for that. DG asked Dr. Varshney to supervise the weed control programmes of IIPR, after discussion with them, ADG (PP) may be kept in the loop of discussions.

Dr D.M. Hegde, Director, Directorate of Oilseeds Research, presented the salient achievements of weed management in sunflower, safflower and castor.

Discussion: Dr. Rajendran wanted to know if there is any study done at DWSR to know the interaction of herbicides effects under different soil types.

Deputy Director General (Hort) opined that DWSR should develop or screen herbicides against specific weeds and then give to crop directorates for testing in cropping systems.

Dr S. K. Srivastava, Director, Directorate of soybean Research, presented the weed management issues in soybean. He remarked that due to continuous use of monocot selective herbicides, weed shift to broad leaved weeds may occur. He informed that a new herbicide diclosulam (22 g/ha) is effective against *Cyperus rotundus* in soybean.

Dr J. S. Chauhan, Director, Directorate of Rapeseed Mustard Research, presented the weed management in rapeseed-mustard.

Discussion: Director, IARI was inquisitive about the effect of isothiocyanates released by mustard in soil on weeds, if any. Deputy Director General (Crops) emphasized on studying the allelopathy induced by mustard in intercropping systems.

Regarding the control of *Orobanche* Dr .T.P. Rajendran supplemented that guar intercropping can minimize *Orobanche*.

Dr J. S. Chauhan wanted to initiate a net work project on *Orobanche* control in mustard.

Dr A.R.G. Ranganatha, Project Coordinator, AICRP on Sesame and Niger, presented the issues of weed management in sesame and niger.

Discussion: Dr. Rajendran questioned on the use of alachlor and metolachlor as these herbicides are not available and are going to be reviewed for phasing out.

Dr. N. Gopalkrishnan, Project Coordinator (Cotton), presented an account of weed control in cotton. He emphasized that farmers do take some weed control measures hence losses due to weeds in cotton may be less than 10%.

Dr O. K. Sinha, Project Coordinator, AICRP on Sugarcane, Indian Institute of Sugarcane Research, presented the weed management in sugarcane.

Discussion: Dr. T. P. Rajendran supplemented that 2,4-D creates a lot of problems as residues. It should not be recommended now. It would be advisable of DWSR and AINP on Pesticide Residues take up dissipation studies of this herbicide in various soil types and agro-ecologies.

Deputy Director General (Hort) suggested to study the fate of accumulated residues of 2,4-D in soil over years and its effect on crops.

Dr Suman Kumar Pandey, Director, Central Potato Research Institute, presented the weed management in potato.

Dr. V. Krishnamurthy, Director, Central Tobacco Research Institute, made a presentation on weed management in tobacco. He asked for collaboration with DWSR for control of *Orobanche*, emphasizing that soil solarization is the best practice in tobacco.

Dr R.K. Agrawal, Sr. Scientist, Indian Grassland and Fodder Research Institute, presented the problems, issues and recommendations of weed management in forage crops.

Discussion: It was suggested not to use obsolete herbicides like Methyl Phenoxy Butanoic Acid (MCPB).

Dr J. C. Bhatt, Director, Vivekananda Parvatiya Krishi Anusandhan Sansthan, presented the salient weed management achievements in rice, maize and millet in hill condition.

Dr B.C. Viraktamath, Project Director, Directorate of Rice Research made a presentation on weeds in rice and their management. He offered to collaborate on research in weedy rice problem along with DWSR and its AICRP centres

Dr. Amrik Singh Sidhu, Director, Indian Institute of Horticultural Research, presented the weed management in horticultural crops. Dr Sidhu wanted to have close collaboration with DWSR.

Dr K.P. Singh, Principal Scientist, IIVR, presented the national scenario on weed management in vegetable crops.

Dr T.R. Rupa, Principal Scientist, Directorate of Cashew Research, presented the weed management issues in cashew. She mentioned that the critical period for weed competition in Cashew is 1-3 years.

Dr B. D. Sharma, Director, Central Institute of Arid Horticulture, presented the weed problem in arid horticulture crop.

Discussion: Deputy Director General (Hort) remarked that there is no relationship between yield and increased organic carbon due to mulching in the experiments presented. He also said that the dynamics of the fate of herbicides in soil including effect on microorganisms should be thoroughly investigated.

Dr Dinesh Kumar, Principal Scientist, Central Institute of Temperate Horticulture, presented the salient features of weed management in temperate fruit crops.

Dr V. K. Singh, Principal Scientist, Central Institute for Subtropical Horticulture, presented the salient features of weed management in subtropical fruit crops.

Dr. A. D. Huchche, Principal Scientist (Hort.), National Research Centre for Citrus, presented the weed management in citrus.

Discussion: Assistant Director General (PP) asked about the present herbicide recommendation for pre-emergence weed control. According to Dr. Huchche there is no pre-emergence recommendation. Deputy Director General (Horticulture) asked about the final recommendation. Dr. Huchche explained that cowpea as inter crop will take care of pre-emergence weeds, followed by the application of glyphosate 4 l/ha.

Dr M. M. Mustafa, Director, NRC for Banana, presented the salient features of weed management in banana.

Dr R. Dhanapal, Head, Crop Production, Central Plantation Crop research Institute, presented the weed management in perennial crops: Coconut, Arecanut and Cocoa.

Dr M. Anandaraj, PC, AICRP on Spices presented the issues, problems and recommendations on weed management in black pepper, cardamom, ginger, turmeric, Seed Spices (coriander, cumin, fennel, fenugreek).

Dr R.S. Mehta, Scientist (SG) Agronomy, NRC on Seed Spices, presented the Weed management in seed spices (cumin, coriander, fennel).

Dr R.C. Srivastava, Director, CARI, presented the Problems, Issues and Management in Weed Research in island ecosystem.

Dr A. K. Misra, Project Coordinator, AICRP (STF), Central Institute for Subtropical Horticulture, presented the weed management in mango, litchi, guava, aonla, bael and papaya orchards.

Dr. K.K. Kumar, Director, NRC on Litchi, presented an account of weed management in litchi. For litchi orchards some weeds are essential for pollinators.

After the presentation of Directors and PCs, the proceedings were summarized by the dignitaries.

At the end scientists of DWSR viz. Drs. V.P. Singh, Sushil Kumar, K.K. Barman, R.P. Dubey, C. Kannan presented their line of work. Dr. Varshney explained that the shortage of manpower is the Directorate's most important hurdle in achieving its objectives.

Dr. G. Kalloo emphasised on the following points:

- There is need to refine and bring new direction in weed management in each crop.
- There is great scope to integrate mechanical and cultural weed control with herbicides.

- Strong backup for training of scientists in weed management is required through regular winter schools as well as through short courses at DWSR.

Dr H.S. Gupta suggested the following points:

- There should be greater focus on integrated weed management.
- Newer ways to be found out to communicate with crop institutes by creating electronic working groups on specific problems of weed management with ADG (PP) in the loop.

Dr T.P. Rajendran suggested the following points:

- There is a need for strong annual interaction between DWSR and crop Directorates, AICRPs. The weed control recommendations of all AICRPs of every respective workshop shall be synthesized by DWSR annually and passed on to NCIPM for joint validation. Special monitoring teams (including Directors/PDs/PCs) of these validations would provide feed back to NCIPM-DWSR.
- DWSR should serve as apex research institute for conducting basic and applied research in weed management which could be translated to other crop Directorates.
- New approaches to biological control of weeds in aquatic and other poorly attempted ecosystems should be explored
- Weed surveillance should be supported by GPS data in AICRPs.

Dr. K.D. Kokate suggested that up-scaling of available weed management technologies through front-line demonstrations (FLDs) in larger area is required. Crop institutes and DWSR may scheme up joint FLDs for this purpose, under the guidance of Extension Division.

Dr S.K. Dutta remarked that weeds are unique genetic materials surviving under odds. They could be utilized as source of new genes under future breeding programmes. In the light of climate change, scientists should understand metabolic pathways in crop and weeds and can find out sources of new genes.

Dr H.P. Singh suggested that up-stream research in weed science is required at DWSR.

DWSR should work out new molecules specific to weeds which can be fitted in cropping systems by the crop Directorates.

Dr S. Ayyappan summarized the proceedings by suggesting the following points:

- Greater coordination among DWSR, Crop Directorates, AICRPs is needed.

- DWSR should ensure that uniform protocol of weed research experiments be implemented at various crop Directorates. A meeting of scientists of crop Directorates, AICRPs can be called at DWSR to sensitize them about uniform protocol of weed research experiments.
- Up-stream research at DWSR is required for developing new weed management technology.

Recommendations

Research

- Upstream research on emerging and challenging issues of weed science is required to be taken up at DWSR and concerned ICAR institutes as voluntary Centres. (Action: DWSR)
- Up scaling of available weed management technologies as Frontline demonstrations (FLDs) to larger areas through Coordinating Centres. (Action: DWSR/Directors/ PDs/PCs)
- Testing of new herbicides should be taken up at DWSR and after thorough studies on persistence, residues, effect on non-target organisms as well as their economics and then passed on to crop directorates, AICRPs for further testing, verification and refinement at their agro ecological zones. (Action: DWSR/ AINP on pesticide residues)
- Greater emphasis for developing management technology of wild rice in different rice ecologies including the survey at national level to identify the extent of weedy rice infestation. (Action: DWSR)
- Based on their level of infestation important weeds should be categorized as “National Weeds” (Action: DWSR)
- Effective weed management strategies should be developed for rain-fed upland rice and direct seeded rice. (Action: DWSR)
- New approaches for bio-control of problematic weeds should be explored. (Action: DWSR)
- Greater emphasis on management of aquatic weeds particularly submerged ones. (Action: DWSR)
- Weed biology should be studied thoroughly. (Action: DWSR)
- Weed surveillance should be supported by GPS data. (Action: DWSR)
- DWSR should take up research on fractionation of various botanicals and develop new bio molecules for weed control. (Action: DWSR & Chemistry scientists of ICAR institutes)
- Develop strong research network for devising small tools and implements for weed control for small and marginal farmers. (Action: DWSR/ CIAE / crop institutes)

- Intervention of Council at higher level for release of successful bio-control agent identified by NBAII against *Mimosa* spp. in Kaziranga National Park, (Action: DWSR/NBAII)
- Seed priming and seed health for early germination and vigour should be exploited in weed management. (Action: crop institutes/DWSR)
- Protocols of experiments to be finalized by DWSR in weed management studies in consultation with Crops & Horticulture Institutes. (Action: DWSR)

Administrative

- There is urgent need for better interaction and coordination on weed science research among different Crop and Horticulture Directorates and AICRPs with DWSR. (Action: all Directors/ PDs/ PCs, DWSR & ADG (PP))
- All Crop and Horticultural institutes should be included as voluntary centres of DWSR for better coordination of research. DWSR should act as resource centre with all other institutes as a clientele. (Action: DWSR)
- DWSR should serve as nodal agency for maintaining updated and uniform protocols of experiments on weed science. Scientists working in relevant fields of weed management in different institutes should meet periodically at DWSR and develop uniform research objectives and protocols for experiments. (Action: DWSR)
- Training for the ground-level workers and farmers for proper mixing and application of herbicides, (Action: DWSR)
- Strong back up for training to scientists in weed management;
- KVKs should be suitably informed and trained on weed management practices periodically. (Action: DWSR)
- Strict quarantine norms should be developed and implemented at ports while importing food grains by DPPQS. (Action: ADG (PP))
- A policy decision should be taken for developing and adopting GM crops in the country. (Action: DDGs and ADG (PP))
- Electronic working groups can be created for better exchange of new information on Weed Management. (Action: DWSR)
- Scientists working in weed management should be sensitized on availability of spurious herbicides in market. Simple diagnostic techniques to identify such spurious herbicides should be developed. (Action: DWSR)
- A committee of Deputy Director Generals from Crops, Horticulture, NRM, Assistant Director General (PP) and Director DWSR be constituted to monitor the interaction among different divisions of ICAR particularly crop and horticulture with DWSR. (Action: ADG (PP)/Director, DWSR)

18 May, 2010

The Director General along with Deputy DGs visited the DWSR farm. DG inaugurated the recently developed “Phyto-remediation Facility” and was shown the FACE facility, Lysimeters for herbicide residue studies.

The Director General took a meeting of staff of DWSR and asked for any problem faced by the scientists and staff and asked for the suggestions that how the DWSR can be more achiever in its mandates. He advised on the following points:

- Considering the cadre strength of the Scientists at DWSR, number of projects are too many. He asked the Director to prioritize the issues on weed science research in consultation with RAC.
- DG agreed for the need of construction of third wing of DWSR, training hostel, a 32 seater bus.
- DG urged upon the director and scientists to formulate projects in National perspective. A group of scientists may be assigned such projects.
- DG asked the director to look into readjustment of 3 posts of artists cum photographer at the Directorate.

Finally the Director General expressed his happiness over the research and other activities being carried out at DWSR and complimented the Director and staff for continuing the good work.

At the end Dr Jay G. Varshney profusely thanked the DG, Deputy Director Generals, Assistant Director General, Directors and Project Coordinators for attending the Interface meeting.

List of participants

Sl. No.	Name and Address
1.	Dr. S Ayyappan, Secretary (DARE) & Director General (ICAR), New Delhi
2.	Dr. S. K. Dutta, Deputy Director General, (CS) ICAR, New Delhi
3.	Dr. H.P. Singh, Deputy Director General (Hort.) ICAR, New Delhi
4.	Dr. Kokate, Deputy Director General (Ext.), ICAR, New Delhi
5.	Dr. T.P. Rajendran, Assistant Director General (PP), ICAR, New Delhi
6.	Dr G. Kalloo, Vice-Chancellor, JNKVV, Jabalpur
7.	Dr H.S. Gupta, Director, IARI, New Delhi
8.	Dr. Jay G. Varshney, Director, DWSR, Jabalpur
9.	Dr. S.K. Srivastava, Director, Directorate of Soybean Research, Indore (M.P.)
10.	Dr. V. Krishan Murthy, Director, CTRI, Rajamuandary
11.	Dr, J.C. Bhatt, Director, VPKAS, Almora
12.	Dr. S.K. Pandey, Director, CPRI, Shimla
13.	Dr. M.M. Mustafa, Director, NRC for Banana, Tiruchirapalli
14.	Dr.A.S Sidhu, Director, IIHR, Bangalore
15.	Dr. B.D.Sharma, Director, CIAH, Bikaner (Rajasthan)
16.	Dr. K.R. Kranthi, Director, CICR, Nagpur
17.	Dr. J.S. Chauhan, Director, Directorate of Rapeseed Mustard, Bharatpur (Rajasthan)
18.	Dr K. Kumar, Director, National Research Centre for Litchi, Muzaffarpur (Bihar)
19.	Dr. O.M. Bambawale, Director, NCIPM, New Delhi
20.	Dr. D.M. Hegde, Director , DOR, Hyderabad
21.	Dr. B.C. Viraktamath, Director, Directorate of Oilseed Research, Hyderabad.
22.	Dr. T.K. Adhya, Director, Central Rice Research Institute, Cuttack
23.	Dr. R.C. Srivastava, Director, CARI, Portblair
24.	Dr. R.J. Rabindra, Director, NBAII, Bangalore
25.	Dr Amrik Singh Sidhu, Director, IIHR, Bangalore
26.	Dr. U.S. Gautam, Zonal Project Director, Zone- 7, ICAR, Jabalpur
27.	Dr. A.K. Misra, Project Coordinator, AICRP on Subtropical Fruits, CISH, Lucknow

28. Dr. M. Anandaraj, Project Coordinator, AICRP on Spices IISR, Marikunnu, Calicut
29. Dr. R.K. Jain, Project Coordinator, AICRP (Nematodes), I.A.R.I, New Delhi
30. Dr. O.K. Sinha, Project Coordinator (Sugarcane)
Indian Institute of Sugarcane Research, Lucknow, (U.P.)
31. Dr. N. Gopalakrishnan, Project Coordinator (Cotton), AICCIP, CICR, Regional Station, Coimbatore
32. Dr. R. Dhanapal, Head, Crop Production Division, CPCRI, Kasaragod (Kerala)
33. Dr. K.P. Singh, Principal Scientist and Head, Vegetable Production, IIVR, Varanasi
34. Dr. V.K. Singh, Principal Scientist, CISH, Lucknow (U.P.)
35. Dr. A.D. Huchche, Principal Scientist (Hort), NRC for Citrus, Nagpur (Maharashtra)
36. Dr. N.N Angiras, Prof.& PI, DWSR Palampur Centre, CSKHPKV, Palampur
37. Dr. T.V. Ramchandra Prasad, Prof.& PI, DWSR Bangalore Centre, UAS Hebbal, Bangalore
38. Dr. C. Chinnusamy, Principal Investigator, DWSR Coimbatore Centre, Deptt. of Agronomy, TNAU Coimbatore
39. Dr. C.T Abraham, Prof. & Head (Agronomy) and P.I. DWSR Thrissur Centre, KAU, Thrissur
40. Dr. Dinesh Kumar, Pr. Scientist, CITH (ICAR) Rangreth, Srinagar (J&K)
41. Dr. T.R. Rupa, Principal Scientist, Directorate of Cashew Research, Puttur – Karnataka
42. Dr. V. Ravindra, Principal Scientist, IIHR, Hesaraghatta , Bangalore
43. Dr Shiv Shevak, Pr. Scientist, AICRP on Chickpea, IIPR, Kanpur
44. Er. H.S. Bisen, Pr. Scientist, DWSR, Jabalpur
45. Dr. V.P.Singh, Pr. Scientist, DWSR, Jabalpur
46. Dr. Anil Dixit, Principal Scientist, DWSR, Jabalpur
47. Dr. Sushilkumar, Pr. Scientist, DWSR, Jabalpur
48. Dr. R.P. Dubey, Sr. Scientist (Agronomy), DWSR, Jabalpur
49. Dr. K.K. Barman, Sr. Scientist, DWSR, Jabalpur
50. Dr. P.K. Singh, Sr. Scientist, DWSR, Jabalpur
51. Dr. Shobha Sondhia, Sr. Scientist (Organic Chemistry), DWSR, Jabalpur
52. Dr. V.S.G.R. Naidu, Sr. Scientist (Economic Botany), DWSR, Jabalpur

53. Dr. C. Kannan, Sr. Scientist (Pl. Pathology), DWSR Jabalpur
54. Dr. Partha P. Chowdhary, Sr. Scientist (Organic Chemistry)
DWSR, Jabalpur
55. Dr. Bhumesh Kumar, Sr. Scientist, DWSR, Jabalpur
56. Dr. P.J. Khankhane, Sr. Scientist, DWSR, Jabalpur
57. Dr. C. Sarathambal, Scientist (Ag. Micro), DWSR, Jabalpur
58. Dr. M.S. Raghuvanshi, Sr. Technical Officer, DWSR, Jabalpur
59. Dr. Sanjay Saha, Sr. Scientist (Agronomy), Central Rice Research Institute,
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60. Dr A. Ravinder Raju, Sr. Scientist, Agronomy,
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62. Dr. Narendra Kumar, Sr. Scientist, AICRP on Chickpea, IIPR, Kanpur
63. Dr. Rajvir Sharma, Sr. Scientist, Division of Agronomy, IARI, New Delhi
64. Dr. A.K. Dixit, Sr. Scientist, IGFRI, Jhansi
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