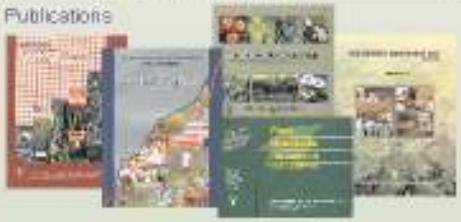
Address of Principal Investigators

Centre's Name	Principal Investigators
AAU, Anand	Dr. Mahesh V. Patel, Agronomist & P.I. AICRP-WC, Anand Agriculture University, Anand-388110 (Gujarat)
AAU, Jorhat	Dr. D. J. Rajkhowa, Sr. Scientist(Agro.), & P.I. AICRP-WC, Dept. of Agronomy, Assam Agricultural University, Jorhat – 785 013 (Assam)
ANGRAU, Hyderabad	Dr. C. Narasimha Reddy, Senior Scientist (Agro.) & In AICRP-WC, College of Agriculture, ANGR Agricultural University, Rajendra Nagar, Hyderabad – 500 030 (Andhra Pradesh)
BAU, Ranchi	Dr. R. Prasad, Assoc. Prof. & P.I. AICRP-WC, Dept. of Agronomy, Birsa Agricultural University, Kanke, Ranchi – 834 006 (Jharkhand State)
CSAUA&T, Kanpur	Dr. A.N. Tewari, Professor & P.I. AICRP-WC, Dept. of Agronomy, CSA University of Agriculture & Technology, Kanpur - 208002 (U.P.)
CSKHPKV, Palampur	Dr. R.N. Angiras, Sr. Agronomist & P.I. AICRP-WC, Dept. of Agronomy, Ch. Sarwan Kumar HPKV, Palampur – 176 062 (H. P.)
GBPUAT, Pantnagar	Dr. O.P. Mishra, Prof. Agronomy & P.I. AICRP-WC, Dept. of Agronomy, College of Agriculture, GBPUAT, Pantnagar – 263 145 Distt. Udham Singh Nagar, (Uttaranchal State)
HAU, Hisar	Dr. S.S. Punia, Scientist (Weed Control) & P.I. AICRP-WC, Dept. of Agronomy, CCS Haryana Agricultural University, Hisar – 125 004 (Haryana)
IGKVV, Raipur	Dr. M.C. Bhambri, Sr. Scientist & P.I. AICRP-WC, Dept. of Agronomy, Indira Gandhi Krishi Vishva Vidyalaya, Raipur – 492 006 (Chhattisgarh)
JNKV, Gwalior	Dr. P.C. Jain, Professor & P. I. AICRP-WC, Dept. of Agronomy, College of Agriculture, JNKV Campus, Gwalior (M.P.) 474 002
KAU, Thrissur	Dr. C.T. Abraham, Assoc. Professor & P.I. AICRP-WC, Dept. of Agronomy, Kerala Agricultural University, KAU- P.O., Thrissur – 680 656 (Kerala)
KKVP, Dapoli	Dr. L.G. Pawar, Agronomist & P.I. AICRP-WC, Dept. of Agronomy, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli – 415 712 (Maharashtra)
MAU, Parbhani	Dr. J.R. Jadhav, Agronomist & P.I. AICRP-WC, Dept. of Agronomy, Marathwada Agricultural University, Parbhani - 431 402 (Maharashtra)
NDUA&T, Faizabad	Dr. R.D. Vaishya, Professor (Agronomy) & P.I. AICRP-WC, Dept. of Agronomy, ND University of Agriculture&Technology, Kumarganj, Faizabad – 224 229 (U.P.)

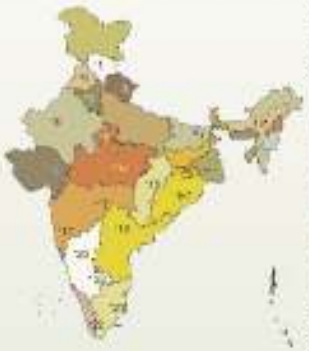
Centre's Name	Principal Investigators
PAU, Ludhiana	Dr. Tarlok Singh, Agronomist & P.I. AICRP-WC, Dept. of Agronomy, Punjab Agricultural University, Ludhiana - 141004 (Punjab)
RAU, Bikaner	Dr. O. L. Sharma, Agronomist & P.I. AICRP-WC, Dept. of Agronomy, Rajasthan Agricultural University, Bikaner – 334 004 (Rajasthan)
RAU, Pusa	Dr. Devendra Singh, Sr. Scientist cum Assoc. Prof. & P.I. AICRP-WC, Dept. of Agronomy, Rajendra Agricultural University, Samastipur, Pusa – 848 125 (Bihar)
TNAU, Coimbatore	Dr. D. S. Kandasamy, Professor (Agronomy) & P.I. AICRP-WC, Dept. of Agronomy, Tamil Nadu Agricultural University, Coimbatore - 641003 (Tamil Nadu)
UAS, Bangalore	Dr. T.V. Ramchandra Prasad, Professor (Agronomy) & P.I. AICRP-WC, Dept. of Agronomy, UAS, Hebbal Campus, Bangalore-560 024 (Karnataka)
UAS, Dharwad	Dr. D.A. Agasimani, Professor & P.I. AICRP-WC, Main Research Station, University of Agricultural Sciences, Dharwad – 580 005 (Karnataka)
VB, Sriniketan	Dr. B. Duary, Principal Investigator, AICRP-WC, Palli Siksha Bhavan (Institute of Agriculture), Visva Bharati, Sriniketan – 731 236 (W. B.)

Volunteer Centres	Principal Investigators
BCKV, Mohanpur	Dr. R.K. Ghosh, Prof. & Principal Investigator, Bidhan Chandra Krishi Viswavidyalaya, Faculty of Agriculture, Department of Agronomy, Mohanpur - 741 252 (West Bengal)
UBKV, Cooch Behar	Dr. P.K. Mukherjee, Lecturer (Agronomy), Uttar Banga Krishi Viswavidyalaya, Pundibari, Cooch Behar, West Bengal 736 165
VPKAS, Almora	Dr. K. Gopinath, Scientist, Vivekananda Parvatiya Krishi Anusandhan Sansthan, Almora- 263 601 (Uttaranchal)

Publications



AICRP-WEED CONTROL CENTRES



1 CSKHPKV, Palampur
2 PAU, Ludhiana
3 CCSHAU, Hisar
4 GBPUA&T, Pantnagar
5 RAU, Bikaner
6 NDUA&T, Faizabad
7 CSAUA&T, Kanpur
8 JNKVV, Gwalior
9 RAU, Pusa
10 BAU, Ranchi
11 VB, Sriniketan
12 AAU, Anand
13 IGKV, Raipur
14 HQ, NRCWS, JBP
15 OUAT, Bhubaneswar
16 AAU, Jorhat
17 MAU, Parbhani
18 DBSKKV, Dapoli
19 ANGRAU, Hyderabad
20 UAS, Dharwad
21 TNAU, Coimbatore
22 KAU, Thrissur
23 UAS, Bangalore

For further details, please contact :
Director
National Research Centre for Weed Science,
Maharajpur, Jabalpur 482 004 (M.P), India
Phone : 0761-2353101, 2353934
Fax : 0761-2353129
e-mail : nrcws@sancharnet.in

Published by	Dr. A.K. Gogoi, Director, NRCWS, Jabalpur
Compiled and edited by	Dr. R.P. Dubey
Technical Assistance	Sh. Sandeep Dhagat and O.N. Tiwari
Designing & Layout	Sh. V. K. S. Mevhran
Published in	February, 2006

AICRP
Weed Control
A Profile



ALL INDIA COORDINATED RESEARCH PROGRAMME ON WEED CONTROL

National Research Centre for Weed Science
Maharajpur, Jabalpur 482 004 (M.P), India

Weeds in general account for 30 % loss in agricultural productivity. Besides they have detrimental effect on biodiversity, environment and well being of human beings, livestock and aquatic life. Research on the status of different kinds of weeds in varied agro-climatic conditions and their control measures in cropped, non-cropped areas and aquatic bodies is very much essential to boost our agricultural production and improve upon the quality of life. The weed research programme in the country started in 1978 with the establishment of "All India Coordinated Research Programme on Weed Control" in collaboration with the United States Department of Agriculture at six locations. The programme has been further strengthened in different phases by adding more cooperating Centres. At present, 22 Centres under AICRP - Weed Control are functioning at various SAUs. The coordinating unit of the programme was attached initially with the Central Rice Research Institute, Cuttack, which was later, shifted to Jabalpur after the establishment of National Research Centre for Weed Science in 1989. The recommendations on weed control are made available to the respective state agencies for their popularization amongst the farming community.

Mandate

- To conduct coordinated trials for developing location-specific weed management technology.
- To demonstrate the weed management technologies through on-farm trials.

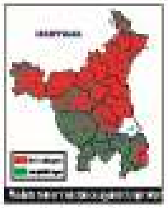
Objectives

- Survey of weed flora, mapping their distribution, ecology and habitat.
- Identification of new herbicides and working out weed competition threshold levels.
- To work out effective and economical weed control schedule for field and plantation crops and in different aquatic conditions.
- Studies on biology and control of problem weeds including aquatic and parasitic weeds.
- To study the long-term residual and cumulative effects if any, of herbicides.
- To standardize bioassay techniques for estimating herbicide residues in soil, crop and water systems.
- Basic research at different centres having adequate laboratory facilities for rendering support to adaptive research.
- Testing of available tools/implements for weed management under varied management systems.
- Training extension personnel in weed management and on-farm research.

Human Resource and financial outlay in X plan

The AICRP-WC has a sanctioned strength of 72 scientists, 54 technical, 32 administrative and 32 supporting staff. The total financial outlay approved for X plan period is 1696.89 lakhs.

Salient Achievements



- Survey on district-wise distribution of weeds has been completed and published. Major recommendations for weed control in cropped and non cropped areas, local names of weeds and status of invasive weeds in India have been compiled and published. Weed atlas, weed identification manuals are in the process of publication.
- On the basis of exhaustive phyto-sociological survey of weeds in different crops and cropping systems, non-cropped areas, wasteland and water bodies, important weeds have been identified. In cropped land, important weeds are *Echinochloa colona*, *Echinochloa crus-galli*, *Ischaemum rugosum*, *Cyperus iria*, *Monochoria vaginalis* in rice and other rainy season crops; *Phalaris minor*, *Avena ludoviciana*, *Chenopodium album*, *Poa annua*, *Convolvulus arvensis* in wheat and other winter crops. In aquatic system, *Eichhornia crassipes*, *Salvinia molesta* and in non-cropped areas *Parthenium hysterophorus*, *Lantana camara*, *Chromolaena odorata* etc. have been identified as major problem weeds.

Salvinia molesta

- In rice-wheat cropping system, continuous use of anilophos in rice resulted in build up of *Cyperus iria*, while butachlor resulted in build up of *Ischaemum rugosum*. Similarly, continuous use of isoproturon in wheat increased the population of *Anagallis arvensis* and *Medicago hispida*. Recommended herbicides used in rice have no residual phyto-toxic effect on wheat and vice-versa.

Ischaemum rugosum

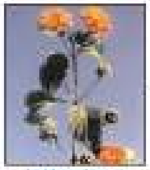
- The critical period of crop-weed competition was found to be between 15-30 days in green gram and black gram, 20-40 DAS in transplanted rice, 40-60 DAS in groundnut, 15-45 DAS in upland drilled rice, soybean, sesamum, mustard 30-45 DAS in maize, sorghum, wheat, 15-60 DAS in pigeonpea and sugarcane and 30- 60 DAS in chickpea, pea and lentil. Weed free condition is to be ensured during this period for higher crop productivity.
- IWM method of combining cultural method (drum seeding + *dhaincha*) and chemical method (pretilachlor-S at 450 g/ha) proved to be effective and economical method of weed control in wet seeded rice.

Cono-weeder for green manure incorporation and weeding in direct seeded rice

- In rice, butachlor 1.5-2.0 kg/ha, anilophos 0.3-0.4 kg/ha, thiobencarb 1.25 kg/ha, pretilachlor 0.75 kg/ha; in wheat, isoproturon 1.0 kg/ha, 2,4-D 0.75-1.0 kg/ha; in groundnut, fluchloralin 1.0 kg/ha, pendimethalin 1.0 kg/ha and metolachlor 0.75 kg/ha; in soybean, fluchloralin 1.0 kg/ha pendimethalin 1.0 kg/ha and metolachlor 0.75 kg/ha, alachlor 1.0 kg/ha, oxadiazon 0.75 kg/ha, oxyfluorfen 0.1-0.15 kg/ha; in maize, atrazine 1.0 kg/ha, in vegetables like chillies, onion, tomato, pendimethalin 1.0 kg/ha; in potato, metribuzin 0.3 kg/ha and in cotton, directed spray of paraquat 0.3 kg/ha (6-8 WAS) were found to be very effective against weeds.
- Continuous use of isoproturon in wheat resulted in resistance to isoproturon in *Phalaris minor*. For control of isoproturon resistant biotypes of *P. minor*, use of fenoxaprop 100 g/ha, sulfosulfuron 20-25 g/ha and clodinafop 50-60 g/ha have been recommended.

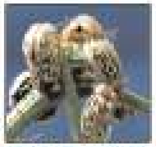
Phalaris minor

- Long-term permanent field trials are being conducted to monitor weed flora shift and herbicide residue build up in important cropping systems under different agro-climatic zones of the country.
- In sugarcane, irrigation at 40-45 days stage and hoeing to destroy emerged weeds followed by spray of atrazine at 2.0 kg/ha or metribuzin at 1.0 kg ha⁻¹ before emergence of weeds is recommended.
- In intercropping systems viz, blackgram + sesamum, pigeonpea + sorghum, chickpea + linseed, potato + mustard, lentil + linseed, groundnut + pigeonpea, application of pendimethalin 1.0 kg/ha was found very effective.
- Integrated weed management practice with pre-emergence application of oxyfluorfen 0.15 kg ha⁻¹ either as spray or sand mix broadcast combined with one hand weeding on 45 DAP proved to be the best integrated weed management practice for transplanted onion.
- For aquatic weed control, glyphosate 0.5-2.0 kg/ha; for control of *Cuscuta* in linseed, pendimethalin 1.0 kg/ha and control of *Parthenium hysterophorus*, spray of 2,4-D or glyphosate at 1-1.5 kg/ha before flowering were found very effective.
- Application of glyphosate at 1% concentration or at 0.75 kg/ha + surfactant on regenerated bushes in October was effective in controlling *Lantana camara*.
- Deep ploughing in summer and puddling of soil followed by impounding of water for two months controls *Saccharum spontaneum* (*Kans* grass) effectively.
- Application of metribuzin 0.2 per cent is recommended for effective control of *Parthenium*.



Lantana camara

- *Zygogramma bicolorata* (Mexican beetle) can effectively control *Parthenium* in Northern plain, hot sub-humid region.
- Estimation of herbicide residues through bioassay has been standardized for many herbicides.
- There was no detectable herbicide residue in soil, water and produce in rice-wheat system where herbicides (butachlor and isoproturon) have been used for 11 years in northern plain and central highlands.



Zygogramma bicolorata feeding on *Parthenium*

- Post-emergence spraying of 2,4-D Na salt at 5 g + urea 20 g /litre of water on 90 DAP in sugarcane effectively reduced the density and dry weight of *Striga asiatica* with better weed control efficiency in sugarcane which resulted in higher cane and sugar yields.
- At Hyderabad, three tyned cultivator in maize and wheel hoe in groundnut were found efficient for controlling weeds. At Jorhat, peg weeder and twin wheel-hoe were found effective in summer rice while twin wheel-hoe and grubber at 40 DAS in rainfed wheat proved effective.
- Zero-tillage technology is being advocated to farmers as an integrated weed management practice.
- Technology for production of vermicompost utilizing weed biomass (*Mimosa invisa*, *Ipomoea carnea* and *Mikania micrantha*) has been perfected at Jorhat Centre.

Zero-till-drill machine

- About 99% farmers of Punjab use herbicides in *Kharif* season while 94% farmers apply in *rabi*. About 10-15 % farmers are using herbicides in upland rice, maize and vegetables at Ranchi.
- To create awareness about *Parthenium* menace amongst public, *Parthenium* awareness day on 4 Sep, 2004 and *Parthenium* awareness week during Sep, 2005 was organized by almost all the Centers.

Mikania micrantha

Parthenium burning

Awareness Training