



ICAR - DWR

SIGNIFICANT ACHIEVEMENTS

2023 - 2024



ICAR - Directorate of Weed Research
Jabalpur - 482004, (Madhya Pradesh)
<https://dwr.icar.gov.in>





April 2024

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Compiled and Edited by:

Dr. JS Mishra

Dr. RP Dubey

Dr. VK Choudhary

Dr. PK Singh

Mr. Sandeep Dhagat

Contributors:

All the scientists of ICAR-DWR and AICRP-WM

Layout & design:

Mr. Sandeep Dhagat, Chief Technical Officer

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Director, ICAR-Directorate of Weed Research,
Jabalpur - 482 004, Madhya Pradesh

Preface

Weed are the most economically important pest in sustainable crop production. Of the total loss caused by various pests in agriculture, weeds accounts for 37% followed by insects (29%), diseases (22%) and others including nematodes, rodents, mites, birds, etc. (12%). The losses caused by weeds can be minimized by using integrated weed management technologies. The ICAR-Directorate of Weed Research, Jabalpur is involved in developing and disseminating the viable weed management technologies for different agro-ecological regions of the country through cutting-edge scientific research and capacity building of farmers and other stakeholders. The major accomplishments of ICAR-DWR during 2023-24 are precisely presented in this document.

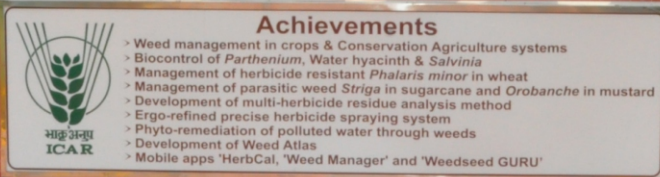
The major achievements of the year 2023-24 have been listed theme wise. Development of integrated weed management technologies for various crops (millets, seed spices, direct-seeded rice, wheat) and CA-based cropping systems, biocontrol of parasitic weed *Striga* in sugarcane, development of mechanical weeders & herbicide spraying systems, and evaluation of nozzles for herbicide efficacy were the major achievements under *Sustainable weed management in diversified cropping systems* programme. Under *Crop-weed interference and herbicide efficacy in changing climate*, the comparative transcriptome analysis of imazethapyr resistant and susceptible biotypes of *Commelina benghalensis*; degradation and persistence of carfentrazone ethyl in wheat & cyhalofop-butyl + penoxsulam in rice, and competitive behavior of *A. paronychioides* with rice under elevated CO₂ and temperature conditions, and efficacy of clodinafop + metsulfuron against *Medicago denticulata* in wheat under moisture stress were studied. Under the theme *Management and utilization of alien invasive weeds*, management strategies for aquatic weeds (*Salvinia molesta*, *Cabomba fructata*, *Hydrilla verticillata*, *Najas* etc.) & invasive weed (*Panicum repens*) were developed. Future projections maps of weed severity of *Alternanthera philoxeroides* and *Salvinia molesta* were developed.

Persistence, degradation and residues in food chain of different herbicides viz., pretilachlor, pyrazosulfuron, cyhalofop-butyl, penoxsulam, pendimethalin and triafamone was studied in rice under the theme *Environmental impacts of herbicides and mitigation measures*. The major achievements of different outreach programmes such as MGMG, FFP and SCSP have been covered under *Dissemination and socio-economic impact of weed management technologies*. MoUs with different organizations were also signed to widen the scope of weed research. Six technologies were certified by the ICAR. In addition, meetings, training programmes, publications, recognitions, seed production, new facilities, revenue generation summarizes the overall achievements of the Institute in these areas. This document provides a glimpse of Directorate's achievements during year 2023-24. The inputs from all the scientists of DWR and AICRP-WM centres are duly acknowledged. We hope that this publication will be useful to the researchers, students, farmers and other stakeholders.

Editors

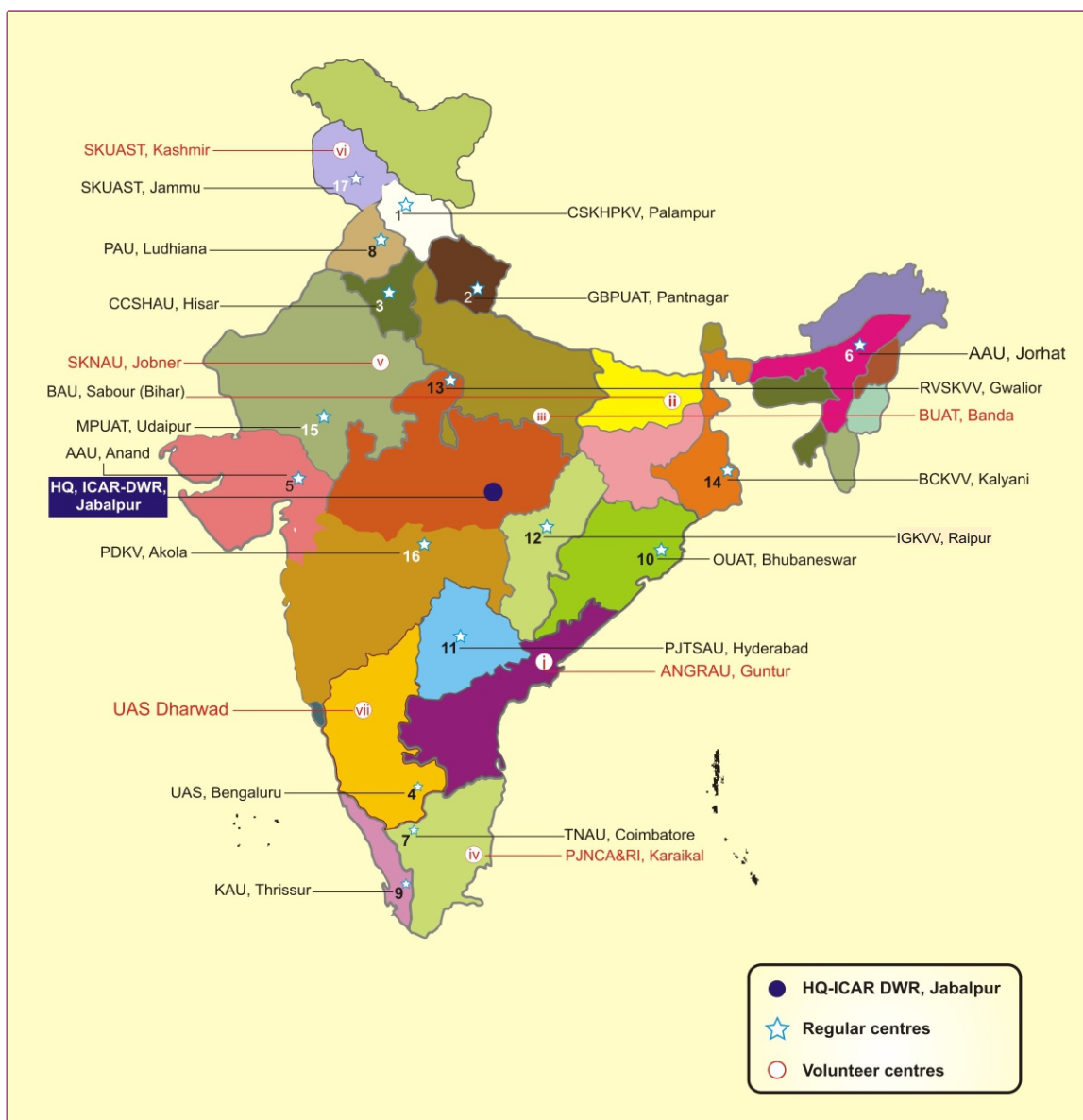
Date: 15 April, 2024

Place: Jabalpur



ICAR-Directorate of Weed Research

All India Coordinated Research Project on Weed Management





ICAR-Directorate of Weed Research

Significant Achievements 2023-24

A. Sustainable Weed Management in Different Crops and Cropping Systems

Millets

- In transplanted finger millet, weeds reduced the grain yield by 48.7%. Application of pretilachlor 30% + pyrazosulfuron ethyl 0.75% WG 615 g/ha as pre-emergence (PE) *fb* 1 hand weeding at 25 DAT proved to be the best management practice with higher weed control efficiency and grain yield of 2.98 t/ha.



- In foxtail millet, post-emergence (PoE) application of metsulfuron + chlorimuron 20 WP 4 g/ha or 2,4-D sodium salt 80 WP 1000 g/ha effectively controlled the broad-leaved weeds, and was on par with two hand weeding at 20 and 40 DAS (AICRP-WM, UAS, Bengaluru).



Seed spices

- In fennel, unweeded control reduced the seed yield by 69.6%. Pre-emergence application of pendimethalin 678 g/ha *fb* 1 mechanical weeding (MW), black polythene mulch (BPM) and rice straw mulch 6 t/ha *fb* hand weeding at 30 DAS were effective in weed suppression and higher productivity of 1.40-1.84 t/ha.

- In Ajwain, weeds reduced the seed yield by 74.1%. Pendimethalin 678 g/ha (PE) *fb* 1 mechanical weeding (MW) at 30 DAS, black polythene mulch, oxyfluorfen 100 g/ha (PE) *fb* 1 MW at 30 DAS recorded higher weed control efficiency and seed yield of 1.55-1.89 t/ha.

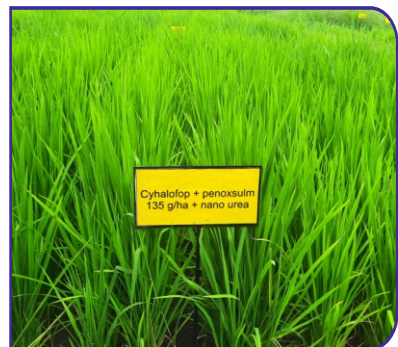


Rice

- Pretilachor + pyrazosulfuron 615 g/ha (PE) *fb* cyhalofop + penoxsulam 135 g/ha (PoE) *fb* HW at 45 DAS recorded lower weed parameters, higher grain yield (4.77 t/ha) and B: C (3.66) in dry direct-seeded rice.



- Weed control efficiency of bispyribac-Na 25 g/ha and cyhalofop+penoxsulam 135 g/ha improved significantly when applied with nano-urea (4 ml/L).

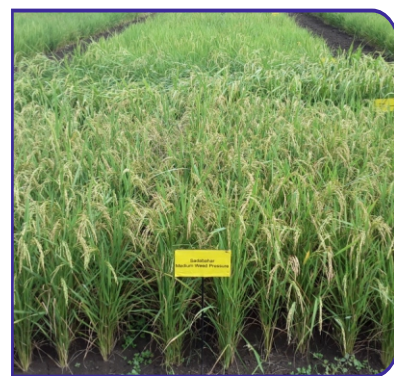


- Expansion of seasonality of *Echinochloa colona* was recorded in untreated plots (without herbicide) of zero-till wheat and it produced total seeds of 1,122/m² during the heading stage of wheat.

Seed production capacity of <i>Echinochloa colona</i> in untreated wheat plots	
Height (cm)	23
No. of effective tillers/plant	2.8
Seeds/panicle	117
No. of plants/m ²	3.4
No. of seeds /m ²	1122



- Rice variety Purna, (98-101 days' maturity with an average grain yield of 3.8 t/ha under weedy check) was found to be highly weed suppressive in direct-seeded rice. Other promising weed competitive cultivars identified were Sadabahar (110 days), IR 64 Drt-1 (118 days), Swarna Shreya (120 days), DRR 47 and Swarna Samridhi (130 days).



- Application of pendimethalin 678 g/ha (38.7 CS) as (PE) *fb* penoxsulam + cyhalofop-butyl (Ready-mix, RM) 135 g/ha as (PoE) led to the aggressive growth of *Ludwigia parviflora* and *Ludwigia perennis*.
- Application of pendimethalin 678 g/ha (38.7 CS) as (PE) *fb* bispyribac-sodium 25 g/ha + [(metsulfuron-methyl + chlorimuron-ethyl) (RM)] 4 g/ha (Tank mix) as (PoE) resulted in satisfactory weed control in first year but led to the aggressive growth of *Dinebra retroflexa* and *Eleusine indica* in second year.



- In *tar-vattar* DSR, delay in first irrigation from 7 to 21 DAS reduced *Echinochloa crus-galli* and total dry weight significantly. Pendimethalin 1000 g/ha+ pyrazosulfuron-ethyl 20 g/ha (TM) as (PE) *fb* 1 HW at 30 DAS resulted in 74.8% higher grain yield (4341 kg/ha) as compared to weedy check (AICRP-WM, CCSHAU, Hisar).



Sowing of tar-vattar DSR

Wheat

Surface seeding-cum-mulching technique of wheat sowing using PAU Surface Seeder reduces herbicide use, as weed infestation is lesser in a mulched field. In addition, this technology provides *in-situ* management of paddy residue, builds up soil health, stops residue burning and saves the crop from terminal heat stress (AICRP-WM, PAU, Ludhiana).



Wheat sowing with Surface-seeder



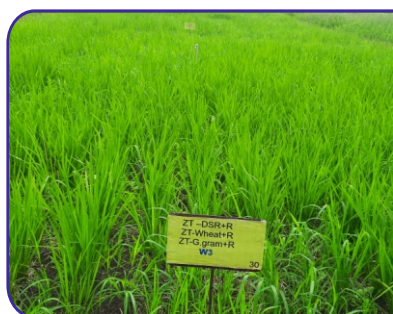
Wheat emergence through paddy straw



Surface-seeded Wheat

Integrated weed management techniques for conservation agriculture systems

- In rice-based cropping system under CA, the adoption of integrated weed management [pretilachlor + pyrazosulfuron 615 g/ha (PE) *fb* bispyribac sodium 25 g/ha (PoE) *fb* HW in rice, clodinafop + metsulfuron 64 g/ha *fb* HW in wheat/ pendimethalin 678 g/ha (PE) *fb* HW in chickpea and pendimethalin 678 g/ha (PE) *fb* HW in greengram] provided higher system rice equivalent yield (11.3 t/ha), total water productivity (22.0 kg/ha/mm) and energy productivity (0.25 kg/MJ) and profitability (2.89).
- Cyhalofop + penoxsulam recorded higher microbial population than pretilachlor + pyrazosulfuron *fb* bispyribac sodium in rice. In wheat, mesosulfuron + iodosulfuron showed positive influence on P-Solubilizers and total bacteria compared to clodinafop + metsulfuron. In chickpea, pendimethalin *fb* HW under CT system resulted in improved microbial activity compared to ZT.



- In maize-based cropping system under CA, the adoption of integrated weed management [atrazine+pendimethalin 500+500 g/ha *fb* hand weeding in maize, clodinafop+metsulfuron 64 g/ha *fb* HW in wheat/ pendimethalin 678 g/ha (PE) *fb* HW in chickpea and pendimethalin 678 g/ha (PE) *fb* HW in greengram] provided higher system maize equivalent yield (16.5 t/ha), total water productivity (11.3 kg/ha/mm), energy productivity (0.44 kg/MJ) and profitability (4.05).



Weed management in maize-chickpea cropping system

Application of mesotrione + atrazine (RM) 875 g/ha as PoE (20 DAS) in maize was more effective for weed control and suppressed *Cyperus rotundus* than atrazine + tembotrione (tank mix) (750+120) g/ha or atrazine + topramezone (tank mix) (750 + 25.2) g/ha applied at 15 DAS and produced higher yield. In succeeding crop of chickpea, application of pendimethalin + imazethapyr (RM) 750 g/ha (PE) *fb* MW/HW at 40 DAS effectively controlled the weeds and resulted in higher seed yield (AICRP-WM, PJTSAU, Hyderabad).



Mesotrione + atrazine 875 g/ha at 20 DAS in maize

Pendimethalin + imazethapyr 750 g/ha (PE) *fb* HW at 40 DAS in chickpea

Management of parasitic weed *Striga* spp. in sugarcane

Results of the experiments conducted in farmer's field at village-Yeragatti in Belagavi District of Karnataka revealed that application of UASD-AMF consortium enhanced the plant height (180.20 cm), number of tillers (6.0/meter length), relative chlorophyll content (33.52), dehydrogenase activity (40.04 μg TPF formed/g soil/day), phosphatase activity (33.12 μg pnp released/g soil/hr), while reducing the number of *Striga* emergence (1.20/meter length) compared to un-inoculated control sugarcane plants (UAS, Dharwad).



Un-inoculated control



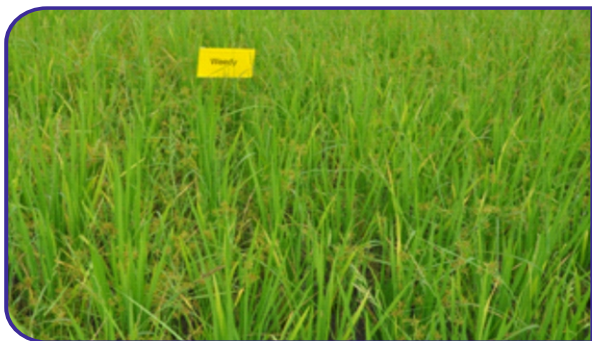
Soil application of AMF consortium



UAS-D AMF consortium

Weed Management in Natural Farming System

- In rice-chickpea-greengram cropping system, stale seedbed technique (native weeds were allowed to germinate for 10-15 days' period before puddling) was found highly successful for managing weeds in transplanted rice.



Weedy



Stale seed bed

Development of mechanical weeders and herbicide application systems

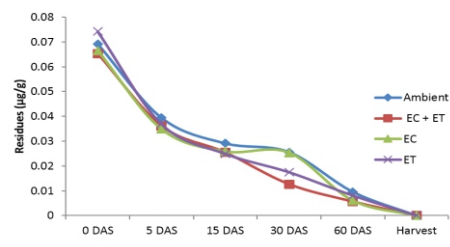
- A prototype of manual weeder was developed to perform weeding operation in heavy soil having high moisture content.
- The manual wheel hoe was improvised by replacing the weeding element of weeder with four rotating cutting wheels to perform the weeding operation.
- A power weeder was developed using a nails based rotating element for weed management in direct-seeded rice.
- Three nozzles viz., AIXR, Turbo Jet, Turbo Twin Jet were evaluated for their efficacy under residue and non-residue conditions with two spray penetration angle (0° & 45°) in vertical direction to the ground. All the nozzles were at par in weed control efficiency at spray penetration angle of 45° .
- A windows based application 'Drone Spray Calculator' was developed in Microsoft Visual Studio 2022 to predict the output parameters related to the drone herbicide application.

B. Crop-Weed Interference and Herbicide Efficacy under Changing Climate



Crop-weed interaction and herbicide efficacy in wheat under elevated CO_2 & temperature

- *Alternanthera paronychioides* was more competitive to rice under elevated CO_2 and temperature than ambient conditions.
- The efficacy of cyhalofop-butyl + penoxsulam 135 g/ha against rice weeds was decreased significantly under elevated temperature, eCO_2 . Reduction in herbicide efficacy led to enhanced weed biomass and rice yield reduction.
- In wheat, degradation of carfentrazone-ethyl was less under ambient conditions leading to higher persistence of herbicide as compared to elevated CO_2 and temperature. Carfentrazone persisted up to 60-90 days in soil, whereas at harvest, it was found below the detection limits ($0.001 \mu\text{g/g}$).



The efficacy of clodinafop + metsulfuron (60+4 g

- ai/ha) against *M. denticulata* was delayed by three days under drought compared to the irrigated control. *M. denticulata* interference reduced the rate of photosynthesis by 48.82% (untreated) and 40.68% (herbicide treated) in wheat under drought compared to weed-free. However, the effect of *P. minor* on wheat has been found to be non-significant.

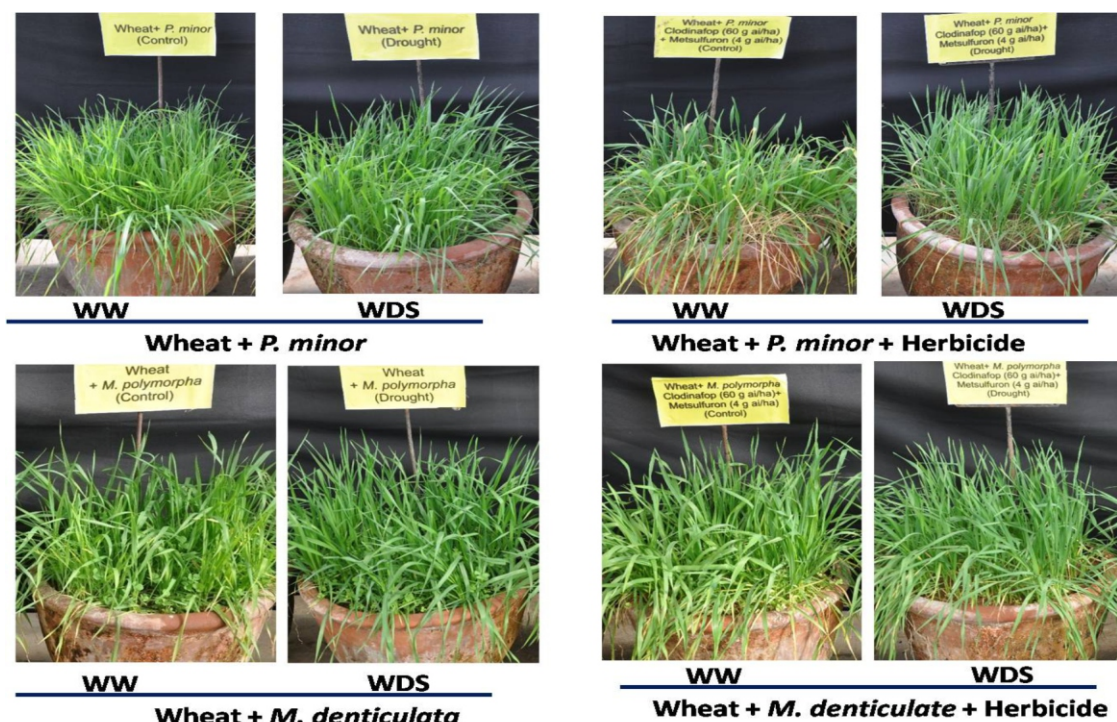


Fig. Impact of drought stress on herbicide efficacy against *P. minor* and *M. denticulata*

Comparative transcriptome analysis of Imazethapyr resistant and susceptible biotypes of *Commelina benghalensis*

The *Acetolactate synthase* gene containing contigs from denovo assembly of *C. benghalensis* was obtained by BLAST analysis and gene prediction was carried out by FGENESH gene prediction tool using *Arabidopsis thaliana* as reference organism. The resistant and susceptible ALS alleles contained about 650 amino acids. Pairwise sequence alignment of the protein sequence of the ALS alleles in resistant and susceptible biotypes indicated that there is a single non-synonymous mutation in the resistant allele. This mutation resulted in conformation changes in the three-dimensional protein structure of the resistant and susceptible isoforms of ALS enzyme.

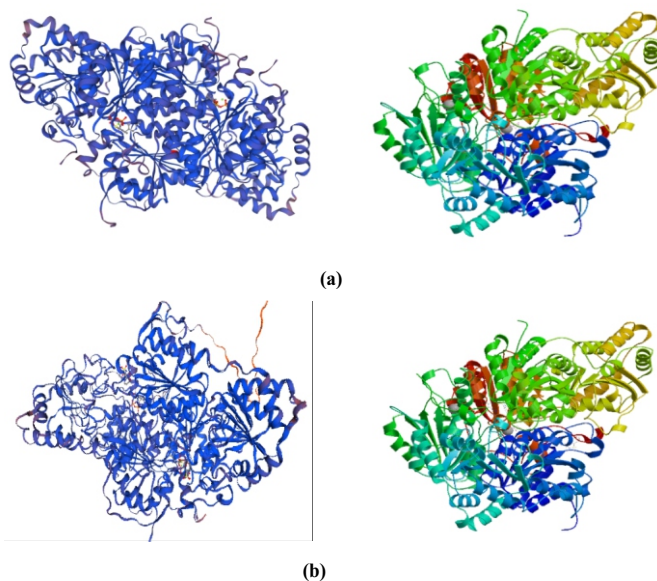


Fig. Three-dimensional protein structure of the ALS enzyme in *Commelina benghalensis* resistant biotype (a) and susceptible biotype (b)



C. Management and Utilization of Invasive Alien Weeds

Biological control of aquatic weed *Salvinia* in Satpura water reservoir: A success story

Under a consultancy project, the ICAR- Directorate of Weed Research, Jabalpur completely cleared the *Salvinia* infested approximately 1100 hectares of the Satpura Water Reservoir at Satpura Thermal Power Station (STPS) in Sarni, Madhya Pradesh within 18 months through strategic release and periodic monitoring of insect bio-agent *Cyrtobagus salviniae*. In addition, this project helped in restoring ecological equilibrium and brought about a positive transformation in the livelihoods of local fishermen who had suffered from decreased fishing opportunities due to the dense weed cover. This success story highlights the effectiveness of integrating biological control methods with socioeconomic considerations for the sustainable management of aquatic ecosystems.



Salvinia infested Satpura water reservoir (L) and Cleaned reservoir after intervention (R)



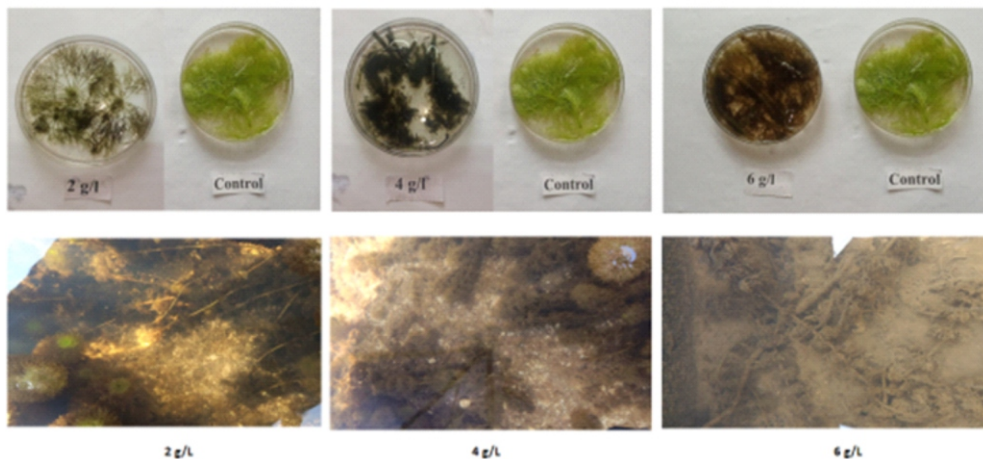
Restoration of fishing activities in Satpura reservoir

Management of submerged aquatic weeds by liming

Managing freshwater aquatic weeds like *Cabomba fructata*, *Hydrilla verticillata*, *Najas* sp., *Utricularia* sp. and *Limnophila heterophylla* is highly challenging. Application of calcium oxide (CaO) at doses of 6-10 g/L of water volume in the water body in ponds and irrigation channels was found as an effective and environmental-friendly strategy for managing these group of weeds. The weed death occurred within two weeks. No adverse effects on aquatic fauna, such as fish and snails, were observed (AICRP-WM, KAU, Thrissur).



Pond view before and after liming



Phytotoxicity of quicklime on *Limnophila heterophylla* at 14 days after application- field study

Management of Torpedo-grass (*Panicum repens* L.) in non-cropped lands

Premixed application of glyphosate 71% + ammonium sulphate 2 g/m² and glyphosate 41% (10 ml/L)+ ammonium sulphate 2 g/L twice at an interval of two months had shown 91.94% and 91.04% control of *Panicum repens* in non-cropped situation, damaging nearly 90.7% and 88.9% underground rhizome of the weed, respectively (AICRP-WM, AAU, Jorhat).



Torpedo-grass (*Panicum repens*) infestation in Assam - a rather serious threat for both cropland and non-cropland situations

Impact of lantana removal on soil micro flora diversity

Removal of invasive weed *Lantana camara* had a positive effect on free-living nitrogen fixer's population (5-13%) in Bastar and Balrampur forests.

Future projections of weed severity

- At present, the *Alternanthera philoxeroides* is found all over the country. However, future climatic conditions are predicted to be moderately favourable for the species except for few places in coastal areas of southern India, central India, Punjab, Haryana, Uttarakhand and North Eastern states. In case of *Salvinia molesta* the model predicted the range expansion in future climate in the coastal areas along with eastern, central and few North-eastern states of the country.

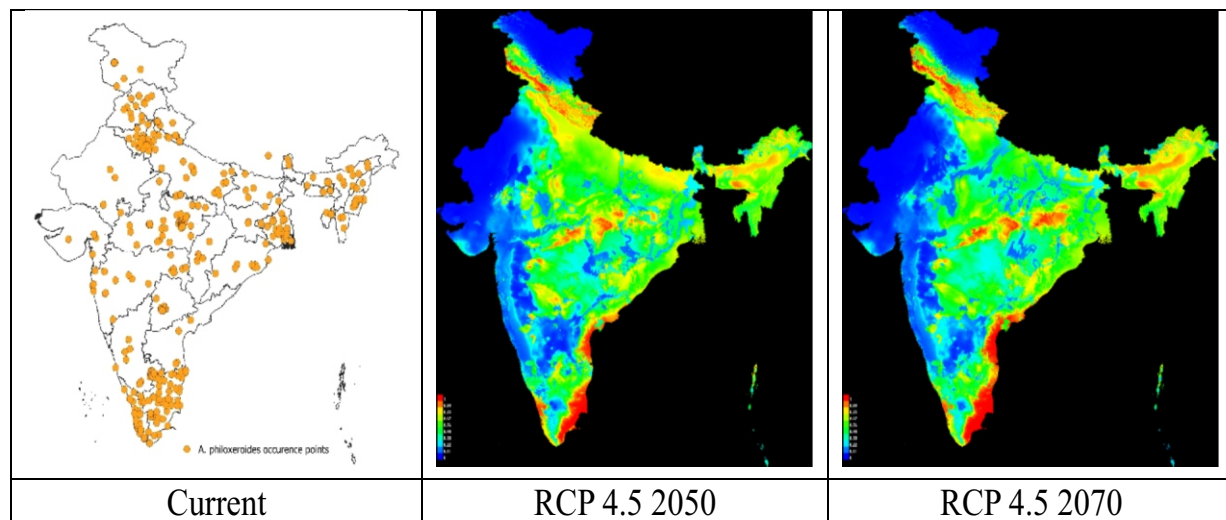


Fig. Current and future distribution of *Alternanthera philoxeroides*

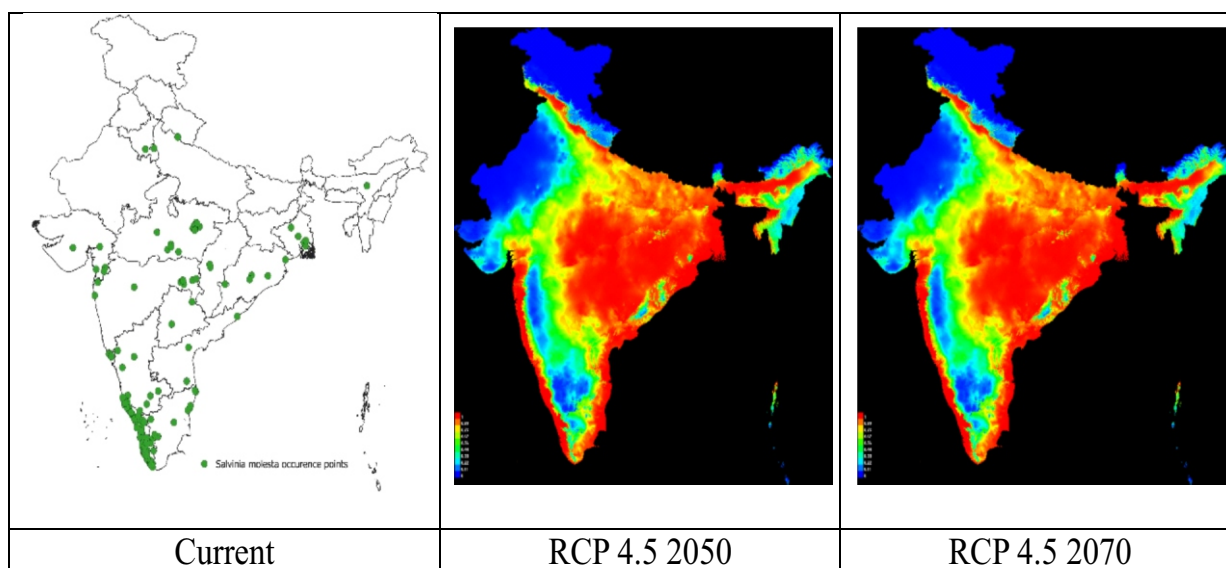
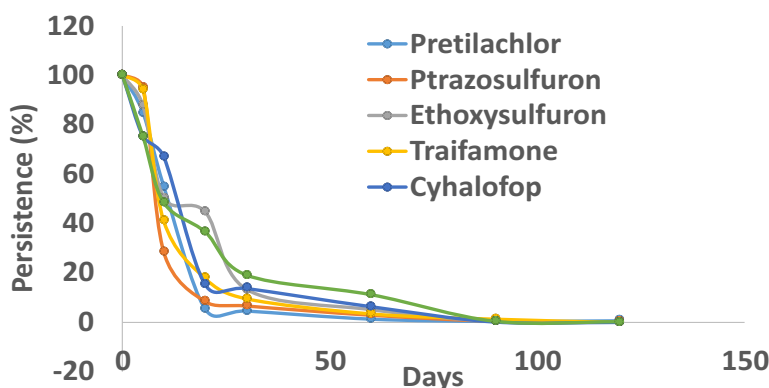


Fig. Current and future distribution of *Salvinia molesta*

D. Environmental Impacts of Herbicides and Mitigation Measures

- More than 90% dissipation of pretilachlor, pyrazosulfuron, cyhalofop-butyl, penoxsulam and triafamone was found in rice field and residues were below the MRL (cyhalofop, MRL 0.5 mg/kg), penoxsulam (0.02 mg/kg) and triafomone (MRL 0.01 mg/kg) in the rice grains, and straw.
- Faster degradation of pendimethalin was observed in the soil when applied during day time than morning or evening applications (half-life, 16.31 to 21.3 days).



E. Dissemination and Socio-economic Impact of Weed Management Technologies

- During the year 2023-24, a total of 17 training programmes and 65 Front-line Demonstrations & On-farm Trials were organized for the farmers, input dealers, State Government officials and other stakeholders. A total of 1267 nos. of stakeholders were benefitted under different programmes such as Farmers FIRST, Mera Gaon Mera Gaurav and SCSP. More than 2.0 lakhs bioagents (*Zygogramma bicolorata*) for management of *Parthenium* were distributed to the farmers and other stakeholders.



- The '18th *Parthenium* Awareness Week', was organized during 16-22 August, 2023 under the auspices of the Directorate involving SAUs, ICAR institutions, KVKs, municipal corporations, schools and colleges, NGOs and others. Through a diverse array of educational initiatives, awareness campaigns, and community engagement activities, stakeholders from all walks of life came together to confront this shared threat head-on. A report on '18th *Parthenium* Awareness Week' covering various activities undertaken during the week by different organizations throughout the country was also published. Press Conference, Webinars, Live programmes and Training programmes were also organized during the week.



Maithana village in Gwalior became *Parthenium* free

In the year 2016, about two-thirds of the village Maithana of Morar block in Gwalior district was under the grip of *Parthenium* and gradually it started entering the cropped area as well. However, due to the continued *Parthenium* Awareness campaign, support from village *Sarpanch* and other progressive farmers namely Sh. Ram Singh, and strategy formulated by the scientists of AICRP-WM Gwalior centre, now the whole village has become free from *Parthenium* (AICRP-WM, RVSKVV, Gwalior).



Parthenium Awareness Week organized during 16-22 August 2023 in Maithana village



Linkages and Collaborations

To widen the scope of weed research, the ICAR-DWR signed MoUs with following institutions in 2023.

- BITS, Pilani (13th March, 2023)
- IGKV, Raipur (31st May, 2023)
- BAU, Sabour (10th Feb, 2024)

DWR-Industry Meet

To strengthen the collaboration and explore the new avenues of research and technology dissemination to meet the future challenges in weed management, an Industry meet was organized at the DWR, Jabalpur on January 31, 2024, where 32 participants, including 20 delegates from 16 National and Multi-national Agro-chemical industries participated in the meeting.



In addition, 03 new contract research projects funded by various herbicides industries and other organization were undertaken by the Directorate during 2023-24.

S. No.	Project title	Duration	Budget (in lakh)	Funding agency
1	Evaluating bio-efficacy of PIX 5032 30% SC+ PI Super Spreader (silicon based ionic- tank mix adjuvant) against weeds in non_crop	2023	7.82	PI industries Ltd, Gurugram, Haryana
2	Bio-efficacy evaluation of UPL SAS range of products against weed flora of direct seeded rice	2023-24	4.50	UPL Pvt. Ltd. Mumbai
3	Efficacy evaluation of isoxaflutole 225 g/L+ thienencarbazone-methyl 90 g/l SC (Adengo) on maize	2023-24	7.50	Bayer Crop Science Ltd., Thane, Mumbai

Technologies Certified by ICAR

Following 06 technologies of the Directorate were certified by the ICAR in 2023.

- Integrated weed management in minor millets.
- Integrated weed management in conservation agriculture based rice-wheat-greengram cropping system.
- Integrated weed management in maize-wheat-greengram cropping system under conservation agriculture.
- Integrated weed management in conservation agriculture based maize-mustard-greengram cropping system.
- DWR HerbCal: A mobile app for herbicide calculation in 11 regional languages (Downloaded: 4174).
- Weed Manager: A mobile app for weed management (Downloaded: 10926).



G. राजभाषा कार्यान्वयन

खरपतवार अनुसंधान निदेशालय में दिनांक 14-29 सितम्बर 2023 तक हिन्दी पखवाड़ा आयोजित किया गया। हिन्दी पखवाड़े के दौरान निदेशालय में सात प्रतियोगिताओं का आयोजन किया गया जिनमें आलेखन एवं टिप्पण, तात्कालिक निबंध लेखन, हिन्दी शुद्धलेखन, कम्प्यूटर में यूनिकोड पर टाईपिंग, अन्ताक्षरी, विवज काटेस्ट एवं वाद-विवाद प्रतियोगिताएं थी। निदेशालय द्वारा प्रकाशित “तृण सन्देश” पत्रिका का विमोचन भी किया गया। नगर राजभाषा कार्यान्वयन समिति, कार्यालय क्रमांक-2 द्वारा वर्ष 2022-23 के दौरान राजभाषा हिन्दी के प्रयोग-प्रसार के क्षेत्र में सर्वाधिक एवं सराहनीय कार्यों के लिए खरपतवार अनुसंधान निदेशालय को प्रथम पुरस्कार (राजभाषा शील्ड) से सम्मानित किया गया।



Publications

During the year 2023, the Directorate has published a total number of 39 research papers, 11 book chapters, 02 books, 05 technical/extension bulletins, 15 popular/technical articles, 02 Annual Reports, 02 Newsletters and 01 Hindi magazine.



Research papers with >6.0 NAAS ratings

1. Chethan C.R., Shrivastava A.K., Nare B., Kumar S.P., Singh P.K., Venu S.A., Manjunath K., Chaturvedi, S. 2023. Effect of tuber shape, picking cup size and peripheral speed of metering unit on tuber metering efficiency of belt type automatic potato planter. *Agricultural Mechanization in Asia Africa and Latin America*, 54(2): 38-45 (NAAS: 6.3).
2. Choudhary V.K. and Meena R.S. 2024. Advanced technological adaptations can improve the energy-cum-carbon-efficiency of diverse rice production systems. *Heliyon*. <https://doi.org/10.1016/j.heliyon.2024.e27691>. (NAAS: 10.0).
3. Choudhary V.K. 2023. Weed suppression, weed seed bank and crop productivity influenced under tillage and mulches in maize-rapeseed cropping system. *Crop Protection* 172 <https://doi.org/10.1016/j.cropro.2023.106333>. (NAAS: 8.8).
4. Choudhary V.K., Reddy S.S., Mishra S.K., Gharde Y., Kumar S., Yadav M., Barik S. and Singh P.K. 2023. First report on ALS herbicide resistance in barnyardgrass (*Echinochloa crus-galli*) from rice fields of India. *Weed Technology* 37: 236-242. doi: 10.1017/wet.2023.24. (NAAS: 7.40).
5. Dwivedi S.K., Soni S.K., Mishra J.S., Koley T.K. and Kumar S. 2024. Assessment of terminal heat tolerance ability of wheat genotypes based on chemometric analysis and agro-physiological traits. *Acta Physiologiae Plantarum*, 46: 48. Doi: 10.1007/s 11738-024-03677-1. (NAAS: 8.6).
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Awards and Recognitions

Several awards and recognitions have been bagged by the scientists and other staff during 2023.

1. Dr. R.P. Dubey: **Best Oral Presentation Award** in National Seminar on Abiotic Stress Management for Sustainable Millet based Production Systems during 22-23 August, 2023 at NIASM, Baramati.
2. Dr. VK Choudhary: **Best Presentation Award & Best Poster Award** in XXII Biennial National Symposium on Climate-smart Agronomy for Resilient Production Systems and Livelihood Security" during 22-24 November, 2023 at ICAR-CCARI, Goa.
3. Dr. Himanshu Mahawar: **Young Scientist Award** in 64th Annual International Conference of the Association of Microbiologists of India during 1-3 December, 2023 at Bundelkhand University, Jhansi.
4. Dr. Surabhi Hota: **Best Ph.D. Thesis Award** and **Best Poster Award** in National seminar on Soil Ecosystem Services for Sustainable Agriculture (SESSA) during 21-23 February, 2024 at ICAR-NBSS&LUP, Nagpur.
5. Er. Chethan, C.R.: Confirmed the "APWSS 2023 - Young Scientist Award" from Asian Pacific Weed Science Society and "Second best paper in Oral" presentation in "35th National Convention of Agricultural Engineers & National Seminar on Emerging Technologies for Advances in Agriculture & Horticulture" held at JNKVV Jabalpur 12-13 September, 2023.
6. Dr. Dasari Sreekanth, Scientist (Scientific category); Sh. Basant Mishra, Senior Technical Officer (Technical category); Sh. M.K. Meena, Senior Technical Officer (Technical category); and Sh. Sant Lal, Supporting Skilled Staff: **Best Worker Awards** for the year 2022-23 during the ICAR-DWR foundation day held on 22 April 2023.

7. Dr. Pijush Kanti Mukherjee: **Outstanding Scientist Award-2023** by the Society for Biotic & Environmental Research (SBER) during the 3rd Biotic Science Congress (BioSCon, 23), and International Conference on Advancement in Plant Health Research- Retrospect & Prospect during 7-8 November, 2023 at VISVA BHARATI.
8. Dr. Shobha Sondhia: **Distinguished Woman Researchers Award** at 9th Annual Women's Meet, Chennai on 2nd March, 2024.
9. Dr. Surabhi Hota, Mr. Veer Singh, Mr. Nemichand Kurmi and Mr. Mohan Lal Dubey received **Medals** in Carom, and Race events in ICAR Central Zone Annual Sport Meet during 18-21 December 2023 at Bhopal.



Seed Production

In order to increase the Institute's revenue, the Directorate has started quality seed production programme with Madhya Pradesh State Seed and Farm Development Corporation (MPSS & FDC). A total of 155.3 tonnes of certified seed of rice 77.4 t (Sahabhagi), wheat 57.0 t (MP 3382), mustard 5.2 t (PM 30), chickpea 10.3 t (RVG 202) and greengram 5.4 t (Virat), was produced and sold to the MPSS& FDC during 2023-24, and revenue of Rs. 32,55,520/- was generated.

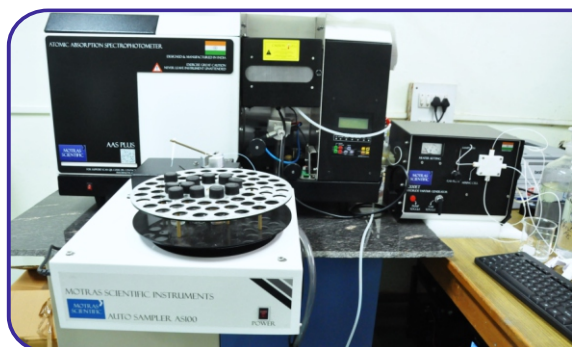


Annual Sport

The DWR athletes participated in ICAR Central Zone Annual Sport Meet during 18-21 December 2023 at Bhopal, and achieved medals in various sport categories.

New Facilities

During 2023-24, new facilities/ equipment/ vehicle/ farm implements, such as AAS, GelDoc, mini tractor, *khalihan* shed, computers were created.



Atomic absorption spectroscopy



Gel Doc System



Khalihan shed



Mini Tractor

Revenue Generation

During 2023-24, the Directorate generated total revenue of Rs. 79.47 lakhs from various sources such as sale of seed & farm produce, guest house, herbicide testing, etc.

Budget Utilization

The Directorate utilized 100% of its budget* as per RE of 2023-24.

Head of expenditure	Budget received (RE)	% of expenditure
ICAR-DWR+SCSP		
Grant-in-Aid Capital	81.52	100
Grant-in Aid General	411.77	100
AICRP-WM+SCSP		
Grant-in-Aid Capital	11.91	100
Grant-in Aid General	141.61	100
Grand Total	646.81	100

*Excluding salary

New Scientists Joined

During 2023-24, Six new scientists namely; Dr. Surabhi Hota (Soil Science), Dr. Sahadeo I. Kuwardadra (Economic Botany), Dr. Mogili Ramiah (Entomology), Dr. Deeksha Mudagadde (Entomology), Dr. J.K. Soni (Agronomy), and Dr. Archana Anokhe (Entomology) joined the Directorate. Dr. Mogili Ramiah was transferred to ICAR-IARI, New Delhi.

Important Meetings/Conferences Organized

Name of activity	Date and venue
XXX Annual Review Meeting of AICRP-Weed Management	26-27 May, 2023; SKUAST, Jammu
Institute Research Committee Meeting	13-14 June 2023; ICAR-DWR Jabalpur
XXXI Institute Management Committee Meeting	27 th December, 2023; ICAR-DWR Jabalpur
Institute Review by Secretary DARE & DG, ICAR	3 rd January, 2024
QRT Meeting	3-4 January, 2024; ICAR-DWR Jabalpur
Research Advisory Committee Meeting	6-7 March, 2024; ICAR-DWR Jabalpur



XXX Annual Review Meeting of AICRP-WM



XXXI Institute Management Committee Meeting



Quinquennial Review Team Meeting



XXV Research Advisory Committee Meeting



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फोन / Phones: +91-761-2353001, 23535101, 23535138, 2353934, फैक्स / Fax: +91-761-2353129

ई-मेल / Email: director.weed@icar.gov.in वेबसाइट / Website: http://dwr.icar.gov.in

फेसबुक लिंक / Facebook Link: <https://www.facebook.com/ICAR-Directorate-of-Weed-Research-101266561775694>

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