Weed flora in rice in Bhubaneswar (Orissa, India)

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Weeds seriously limit rice production at Bhubaneswar, Orissa. In 1985 wet season, we surveyed weeds in ricefields in uplands, medium lands, lowlands, and swampy and waterlogged fields, using random sampling of 10 farmers from each site type. From each field, we randomly selected five 1- × 1-m areas.

Only weeds common in all samples are reported here.

1. Uplands

Grasses: *Digitaria sanguinalis, Echinochloa colona, Eleusine indica, Eragrostis nutans, Panicum antidotale, Cynodon dactylon.*

Sedges: *Cyperus rotundus, C. iria, Eimbristylis dichotoma.*

Broadleaved weeds: *Senna obtusifolia, Crotalaria juncea, Celosia argentea, Sida rhombifolia.*

2. Medium lands

Grasses: *Echinochloa crus-galli, Eragrostis nutans, Paspalum conjugatum.*

Sedges: *Cyperus elatus, C. esculentus, C. brevifolius.*

Broadleaved weeds: *Murdannia nudflora, Ludwigia perennis, Corchorus aestuans, Aeschynomene americana, A. aspera.*

The fern *Marsilea quadrifolia* was also found.

3. Lowlands

Eragrostis cilianensis, Oryza sp. (wild rice), *Cyperus exaltatus, Scirpus supinus.*

4. Swampy lands and waterlogged fields

Pistia stratiofes, Glyceria sp., *Glycine* sp., *Ulothrix* sp., *Spirogyra* sp., and *Chara* sp. □

Integrated weed and water management in transplanted rice

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We studied weed control and water use efficiency (WUE) with three irrigation regimes and six weed control treatments (see table) in transplanted rice during 1985-86 dry (DS) and wet (WS) seasons. The treatments were in a split-plot design, replicated three times.

Weeds at the experimental site (sandy clay loam) were *Echinochloa colona, E. crus-galli, Cyperus rotundus, C. iria, C. difformis, Fimbristylis miliacea, Eclipta alba, Ammannia baccifera, Marsilea quadrifolia, Monochoria vaginalis,* and *Ludwigia paryzflora.*

WUE was better with 5-cm continuous submergence than with irrigation with 5-cm water 1 d after water disappeared, saving 40% water in WS and 33% in DS. Grain yields were comparable.

Among weed control treatments, preemergence butachlor (1.25 kg ai/ ha) plus postemergence 2,4-D (sodium salt) (0.75 kg ai/ ha) effectively controlled

Effect of weed control treatments under different irrigation regimes on grain yield, weed dry matter, water use efficiency, and total water requirement of transplanted rice, Madurai, India, 1985-86.

Treatment	Grain yield (t/ha)		Weed dry matter at harvest (g/m^2)		Water use efficiency (kg/ha per cm)		Total water requirement (cm)	
	WS IR50	DS IR20	WS IR50	DS IR20	WS IR50	DS IR20	WS IR50	DS IR20
Irrigation regimes								
5 cm continuous submergence	7.0	5.9	10	26	43	62	166	94
5 cm submergence 1 d after water disappeared	6.9	5.8	14	32	61	92	100	63
Maintenance of 5 cm submergence at reproductive stage and 5 cm submergence 1 d after disappearance at vegetative and ripening stages	6.6	5.4	15	33	50	65	131	83
LSD (0.05)	0.3	0.4	0.9	ns	–	–	1.4	1.2
Weed control methods								
Unweeded check	5.8	4.9	34	75	44	60	136	84
HW 15 and 30 DT	7.2	6.0	9	20	57	78	132	80
Butachlor 1.25 kg ai/ha + HW 30 DT	7.1	5.8	9	24	56	74	132	80
Thiobencarb 1.50 kg ai/ha + HW 30 DT	6.9	5.6	10	23	55	73	132	80
Butachlor 1.25 kg ai/ha + 2,4-D (sodium salt) 0.75 kg ai/ha 30 DT	7.5	6.2	8	18	60	81	131	79
Thiobencarb 1.50 kg ai/ha + 2,4-D (sodium salt) 0.75 kg ai/ha 30 DT	6.8	3.6	9	22	54	73	131	81
LSD (0.05)	0.8	0.4	1.7	1.5	–	–	0.6	2.0
Interaction (weed control × irrigation) LSD (0.05)	ns	ns	ns	ns	–	–	ns	ns

weeds and recorded least weed dry matter and maximum WUE, followed by 2 hand weedings (HW) (15 and 30 d after transplanting [DT]) both seasons.

The combined approach of irrigation to 5-cm submergence 1 d after water disappeared and weed control through preemergence butachlor plus postemergence 2,4-D sodium salt could save irrigation water in transplanted rice that otherwise would be used by competing weeds. □

Managing other pests

A crab trap for a deepwater rice (DWR) pest

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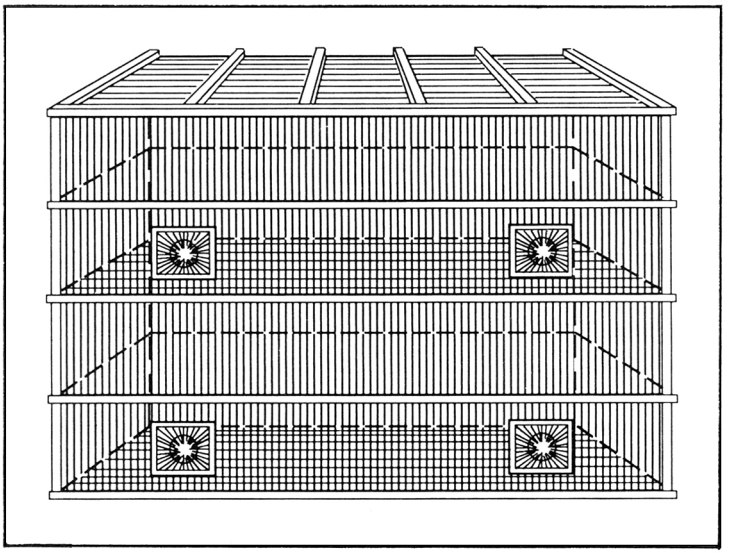
In West Bengal, common freshwater crabs *Paratelphusa hydrodromus* Herbertson and *P. spinigeru* Wood-Manson (Family Potamidae) damage DWR by cutting elongating stems. Damage is most severe in fish - rice culture. Chemical methods, including bleaching powder (calcium chloro hypochlorite), fail to control them.

We designed a crab trap of fine bamboo sticks bound with nylon thread (see figure). Smooth entry points let crabs in, bamboo sticks projecting inside the box keep them from leaving. DWR farmers use similar devices to trap wild fish and prawns in their fields. We tested the crab traps in 1987 wet season. Traps were baited with snail-meat and left in the water ovenight. Each trap collected 30-40 crabs/d during Aug-Sep. The crabs can be eaten.□



Device used to trap field crabs in Chinsurah, West Bengal, India, 1987 kharif.

Farming systems

Performance of rice-based cropping systems in river floodplains

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We evaluated seven rice-based cropping systems for Gomti river floodplain in 1983-84. Soil had 0.20% organic C, 6.2 kg P, and 119 kg K with pH value of 7.7. Rice (*Oryza sativa*) variety Saket 4 was directly seeded in rows 20 cm apart in 6- × 5-m plots. After harvesting the wet season rice crop, wheat (*Triticum aestivum*), barley (*Hordeum vulgare*), chickpea (*Cicer arietinum*), lentil (*Lens esculenta*), safflower (*Carthamus tinctorius*), taramira (*Eureca sativa*), and mustard (*Brassica juncea*) were sown during dry season (DS). The experiment was in a randomized block design with four replications. Grain yields of DS crops were converted to rice yield equivalents and net profits computed (see table).

Rice yield equivalent and net profit of rice-based cropping systems in Gomti River floodplain. Faizabad, India.

Cropping system	Grain yield (t/ha)		Total yield (t/ha)	Total yield equivalent (t/ha)	Net profit ($/ha)
	Wet season	Dry season			
Rice - wheat (C-306)	1.31	1.96	3.27	3.50	216.72
Rice - barley (Azad)	1.24	2.11	3.35	3.33	212.88
Rice - chickpea (Radhey)	1.21	0.11	1.32	1.40	32.16
Rice - lentil (T36)	1.24	0.41	1.65	2.06	124.00
Rice - safflower (T45)	1.22	0.34	1.59	1.77	88.64
Rice - taramira (T-136)	1.33	0.29	1.62	2.02	36.00
Rice - mustard (Varuna)	1.31	0.59	1.90	3.46	223.28

Rice yield equivalents of rice - wheat and rice - mustard crops were highest, with rice - barley next. Rice - chickpea produced least. Rice - mustard gave net profit of $223.281/ha, followed by rice - wheat with $216.72/ ha.