

## Transplanted Rice (Rainfed shallow lowlands and irrigated)

### Weed control by agronomic management

- Land preparation same as Wet direct-sown rice.
- Plant 25-30 days old seedlings at closer spacing of 20 x 15 or 15 x 15 cm with 2-3 seedlings per hill.
- Apply 'N' in 3-4 equal splits depending on the varietal duration and soil fertility.
- Apply the first dose of 'N' at 15 days after planting and the rest in 15-20 days interval.



*Leptochloa chinensis*  
(Chinese Sprangletop)



*Sphenoclea zeylanica*  
(Goose Weed)



*Echinochloa crus-galli*  
(Barn yard grass)- a predominant grassy weed in rainfed transplanted rice

### Newly emerged weeds in rice-rice system

### Mechanical weed control

- Operate cono weeder at 25-30 days after planting in widely planted crops with 10 cm water in the field.
- Remove weeds manually in between and close to rice hills.

### Chemical weed control

- Apply Pyrazosulfuron ethyl (Saathi) at 20 g/ha within 2-3 days of sowing for controlling weeds in nursery bed.
- In main field, follow the recommendation as in case of wet direct-sown rice.
- Additionally, spray Almix (4 g/ha) at 15 DAT against sedges and broad leaf weeds during dry season.



Bensulfuron methyl+Pretilachlor  
- promising herbicide for broad spectrum weed control in transplanted rice

## Integrated Weed Management in Rice

### CRI Technology Bulletin - 90

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# Integrated Weed Management in Rice

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Weeds are undoubtedly a major biotic constraint to rice production. Weeds interfere with rice growth by competing for light, nutrients, water and space and also create habitat for various insects, nematodes and pathogens. The greatest weed pressure and competition occurs in rainfed uplands followed by wet-seeded rice and least in transplanted rice. Grassy weeds (*Echinochloa colona*, *E. crus-galli*, *Leptochloa chinensis*, *Dactyloctenium aegyptium*, *Digitaria sanguinalis*, *Panicum repens* etc.) are the most competitive weed-flora that emerge early and grow simultaneously with the rice crop for a considerable time period. Sedges (*Cyperus iria*, *C. difformis*, *Fimbristylis mileacea*, *Schoenoplectus articulatus* etc.) and broad leaf weeds (*Alternanthera sessilis*, *Ageratum conyzoides*, *Ludwigia octovalvis*, *Sphenoclea zeylanica*, *Cleome viscosa*, *Marsilea quadrifolia*, *Monochoria vaginalis*, *Pistia stratiotes*, *Commelina benghalensis* etc.) emerge subsequently at later stages of crop growth. Sometimes several flushes of weeds come up as seeds present in soil germinate as and when conditions become favourable. An integrated approach involving different preventive measures including adoption of improved crop management practices along with chemical or mechanical methods of weed control can bring about substantial yield improvement of the crop. This bulletin highlights the integrated management strategies for controlling weeds in rice field.

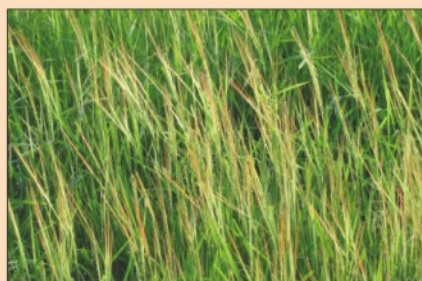


## Preventive methods

- Use certified seeds or 'Clean seed' from a known source free from admixture of weed seeds.
- Cleaning seeds by dipping in 2% brine solution helps in separation of floating weed seeds.
- Avoid application of un-decomposed farm yard manure as it contains viable weed seeds.
- Off-season ploughing after rice harvest reduces weed seed replenishment.
- Go for deep summer ploughing during April-May to expose the vegetative propagules of certain weeds and also to bury the weed seeds at a depth that prevents germination.

## Prevention of wild/weedy rice

- Canals, irrigation channels etc. should be cleared from infestations of wild/weedy rice.
- Crop rotation with soybean, groundnut, maize, sunflower, green gram, black gram etc. helps to reduce weedy rice in subsequent rice crops.
- Adopt 'Stale seed bed technique' to deplete the soil seed bank of wild/weedy rice.
- 'Water seeding' or 'wet seeding' can be adopted in places where water is available.
- Green manuring by *Sesbania* sp in rainfed lowlands helps in smothering weedy rice.
- Winter flooding also helps in controlling weedy rice infestation by promoting seed decay.
- Remove weedy rice panicles by hand picking or cutting at heading/flowering stage.



*Weedy rice - a threat to rice farming*

## Weed management practices

### Dry direct-sown rice (Rainfed uplands and lowlands)

#### Weed control by agronomic management

- Plough the field 2–3 times to get a fine tilth.
- Remove the weeds and crop stubbles before proper levelling for uniform germination and crop stand.
- Sow either by seed drill or behind plough at 20 cm apart rows with 70 kg seed/ha.
- In heavily infested areas, adopt stale seed bed technique by allowing weed seeds to emerge and then kill either by shallow tillage or by spraying non-selective herbicides like Paraquat or Glyphosate (1 kg/ha) 10 days before sowing.
- Avoid basal application of 'N' as it stimulates weed growth.
- Apply the recommended 'N' in 3 equal splits at 20, 40 and 60 days after sowing (DAS) in rainfed uplands.
- In lowlands, apply 'N' in 3 splits ( $\frac{1}{2} + \frac{1}{4} + \frac{1}{4}$ ) at 20, 45 and 65 DAS.



*Echinochloa colona*  
(Jungle Rice)- a predominant grassy weed in dry direct sown rice

## Mechanical weed control (in line sown/ planted crop)

- Operate finger weeder at 15-20 DAS followed by one manual weeding for removal of unwanted plants within rows.
- In heavily infested fields, operate finger weeder at 15 and 30 DAS and supplement with one manual weeding for effective control of weeds.

## Chemical weed control (most cost effective)

- Spray Bispyribac sodium (Nominee gold) at 35 g/ha or Quinclorac (Facet) at 375 g/ha in moist surface soil 10-12 DAS for controlling grassy weeds.
- Spray Fenoxaprop-p-ethyl (Rice star) at 70 g/ha (25 DAS) to control the late emergent grassy weeds in lowlands.



*Bispyribac sodium -promising herbicide for controlling grassy weeds*

## Wet direct-sown rice (Rainfed shallow lowlands and irrigated)

### Weed control by agronomic management

- Dry till one month before sowing followed by puddling twice at 7-10 days interval and levelling.
- Keep standing water in field between two puddling for decomposition of weeds and crop stubbles.
- Do spot seeding with pre-germinated seeds at 20 x 15 cm spacing (15 x 15 cm during dry season) on moist saturated soil with 60 kg seed/ha or continuous seeding at 20 cm apart rows either manually or by drum seeder.
- Apply the recommended dose of 'N' in 4 equal split at 15, 30, 45 and 60 DAS escaping the basal dose as it encourages early weed competition.



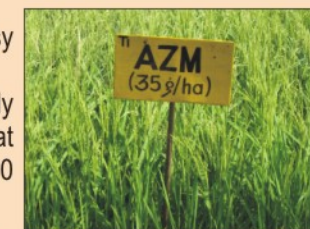
*Cyperus difformis*  
(Umbrella Sedge)- a predominant sedge in wet direct sown rice

## Mechanical weed control

- Operate finger weeder at 15-20 DAS in moist saturated soil followed by one manual weeding.

## Chemical weed control

- Apply Bispyribac sodium at 35 g/ha against grassy weeds.
- To control broad spectrum of weed flora, apply Bensulfuron methyl + pretilachlor (Londax power) at 70+700 g/ha at 8 DAS or Azimsulfuron (Segment) at 70 g/ha at 15 DAS.



*Azimsulfuron- promising herbicide for broad spectrum weed control in wet direct sown rice*