Pest Control and Management
WEEDS

A survey of weeds in transplanted and wet-seeded rice under rainfed and irrigated conditions

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A survey was carried out in Sep 1985 in barangays Sagrada, San Isidro, Pawili, and Takbong of Pili, Camarines Sur, Philippines. Ten wet seeded (pregerminated seed sown on puddled soil) ricefields (six rainfed and four irrigated) and seven transplanted ricefields (three rainfed and four irrigated) were assessed 60–70 d after planting. Percentage weed cover was determined visually.

Severity of weed cover was greater in wet seeded rice and under rainfed conditions. Of the 27 weed species found (see table), 10 were grasses and 6 were sedges. Of the 22 species found in wet seeded rice and 18 found in transplanted rice, 11 were common to. both types of culture. More weed species were found under rainfed conditions than irrigated conditions.

Only *Cyperus difformis, Echinochloa glabrescens, Fimbristylis miliacea,* and *Ludwigia octovalvis* were observed in all growing conditions. *Pseudoraphis spinescens,* which has never been reported as a weed of rice in the Philippines, and *F. miliacea* were the major weeds under rainfed conditions. In irrigated transplanted rice, *Monochoria vaginalis* dominated. In irrigated wet seeded rice, the important species were *Alternanthera sessilis, E. glabrescens, F. miliacea, Ischaemum rugosum,* and *M. vaginalis.*

Percentage weed cover associated with transplanted and wet seeded rice in Pili, Camarines Sur, Philippines.

Weed species	Family	Cover percentage			
		Transplanted rice		Wet seeded rice	
		Rainfed	Irrigated	Rainfed	Irrigated
Alternanthera sessilis (L.) DC.	Amaranthaceae	–	–	–	11
Commelina diffusa Burm. f.	Commelinaceae	<1	–	–	–
Cyperus difformis L.	Cyperaceae	<1	<1	<1	<1
Cyperus iria L.	Cyperaceae	4	–	9	<1
Cyperus rotundus L.	Cyperaceae	–	–	<1	–
Echinochloa colona (L.) Link	Poaceae	2	–	8	5
Echinochloa crus–galli (L.) Beauv. ssp. *hispidula* (Retz.) Honda	Poaceae	<1	<1	–	–
Echinochloa glabrescens Munro ex Hook. f.	Poaceae	<1	<1	3	13
Eclipta prostrata (L.) L.	Asteraceae	<1	–	<1	<1
Eclipta prostrata (L.) L. Hassk. var. *zippeliana* (B1.) Koster	Asteraceae	1	–	<1	<1
Fimbristylis miliacea (L.) Vahl	Cyperaceae	29	<1	15	15
Isachne globosa (Thunb.) 0. K.	Poaceae	<1	<1	–	–
Ischaemum polystachyum Presl	Poaceae	<1	<1	–	–
Ischaemum rugosum Salisb.	Poaceae	–	–	1	10
Leersia hexandra Sw.	Poaceae	–	–	<1	–
Lindernia antipoda (L.) Alston	Scrophulariaceae	–	–	<1	<1
Ludwigia octovalvis (Jacq.) Raven	Onagraceae	<1	<1	<1	<1
Macroptilium lathyroides (L.) Urb.	Papilionaceae	<1	–	<1	–
Marsilea minuta L.	Marsileaceae	<1	–	–	<1
Monochoria vaginalis (Burm.f.) Presl	Pontederiaceae	<1	4	–	9
Panicum repens L.	Poaceae	–	–	<1	–
Pseudoraphis spinescens (R. Br.) J. Vickery	Poaceae	25	–	55	5
Scirpus grossus L. f.	Cyperaceae	–	–	<1	–
Scirpus supinus L.	Cyperaceae	9	–	–	–
Sphaeranthus africanus L.	Asteraceae	–	–	<1	<1
Sphenoclea zeylanica Gaertn.	Sphenocleaceae	–	<1	–	<1
Sporobolus diander (Retz.) Beauv.	Poaceae	–	–	<1	–
Total no. of species		17	9	18	16
Species in common (no.)		8		12	
Total cover (%)		72	6	98	70

Irrigation and transplanting reduced weed cover. □

Control of *Eragrostis japonica* (Thunb.) Trin. in upland rice

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Preemergence herbicides pendimethalin (0.75 and 1.25 kg/ ha) and thiobencarb (1.0 and 1.5 kg/ ha) followed by postemergence application of 2,4-D EE and hand weeding were compared with the manually operated, long-handled rotary weeder, 3 hand weedings, and unweeded check in a field experiment in Vertisols of Paramakudi, South India, in 1984–85.

Eragrostis japonica, the major weed with a population of 252/m^2, constituted 90% of the total weed population and caused 86% yield reduction. With pendimethalin at 1.25 kg/ha, it numbered 12 m^2; with thiobencarb at 1.50 kg/ ha, it was 16 m^2. Total weed dry matter production at 80 DAS with these treatments was low compared to that with 2 hand

weedings and in the unweeded check.

Pendimethalin at 1.25 kg/ ha and thiobencarb at 1.50 kg/ha followed by hand weeding gave highest grain yields (see table).

Weeding cost was highest with the peg-type weeder. The marginal benefit-cost ratio was highest with the combination of thiobencarb at 1.00 kg/ha followed by 2,4-D EE. □

Effect of weed control treatments on major weed, total weed dry matter, and grain yield in upland bunded rice. Tirunelveli, India, 1984-85.

Treatment[a]	Rate (kg/ha)	*Eragrostis japonica* (no. m^2) 80 DAS	Total weed dry matter (kg/ha) 80 DAS	Grain yield (t/ha)	Weeding cost ($/ha)	Benefit: cost ratio
Pendimethalin fb HW 30 DAS	1.25	12.6	61.5	3.1	48.6	6.03
Thiobencarb fb HW 30 DAS	1.5	15.8	69.5	3.0	31.4	7.50
Hand weeding at 20, 35, and 50 DAS	–	19.8	75.9	2.8	63.8	3.65
Working peg-type weeder at 20, 35, and 50 DAS		–25.7	185.4	2.6	82.2	2.16
Thiobencarb fb post-em 2,4-D EE 35 DAS	1.0 0.5	28.5	206.6	2.6	24.3	9.34
Pendimethalin fb HW 30 DAS	0.75	33.6	277.5	2.5	41.1	4.76
Thiobencarb fb HW at 30 and 50 DAS	1.0	30.3	227.6	2.5	51.7	3.73
Pendimethalin fb HW at 30 and 50 DAS	0.75	31.6	221.3	2.5	56.2	3.41
Thiobencarb fb HW 30 DAS	1.0	36.6	265.6	2.4	37.0	5.28
Pendimethalin fb post-em 2,4D EE 35 DAS	0.75 0.5	26.4	208.7	2.4	30.1	6.86
Hand weeding at 20 and 35 DAS	–	106.3	117.3	2.2	48.0	2.97
Unweeded check	–	252.6	1354.5	0.4	–	–
CD (P = 0.05)		3.9	65.9	1.5	–	–

[a] Pre-em = preemergence, post-em = postemergence, fb = followed by, HW = hand weeding. Men labor at US$0.8/8 h and women at US$0.6/8 h. Pendimethalin cost, US$8.0/liter; thiobencarb, US$7.1/liter; 2,4-D EE, US$4.0/liter.

Weeds in shifting cultivation in Quezon Province, Philippines

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In Real, Quezon Province, farmers plant rice at the start of the rainy season immediately after clearing secondary forests by dibbling into fields that have had no land preparation. After the rice is harvested, citrus or sweet potato is planted, depending on the availability of citrus seedlings.

In 1984, we surveyed 4 recently cleared fields 19, 69, and 76 d after seeding (DAS) rice. At the same time, we surveyed adjacent areas planted to citrus and sweet potato which had been cleared the previous year. Percentage of weed cover and weed species were recorded.

None of the crops were weeded. In recently cleared areas where the land was sloping, weeds were not a problem. Weed cover was 0-3% at 19 DAS and 0-15% at 69-76 DAS. In one field, 10% was flat land adjacent to a stream. The soil was moist most of the time, which favored weed seed germination and growth. Weed cover in this area ranged from 30% at 19 DAS to 90% at 76 DAS.

Where clearing had been done the previous year, weed infestation was severe, particularly in the area planted to citrus where weed cover was 98%. *Paspalum conjugatum,* the predominant weed, covered 95% of the area. Sweet potato suppressed weed growth; weed cover in that field was only 30%.

Weeds growing in association with the different crops are listed in the table. *P. conjugatum* was the predominant weed in all fields. It is expected that *P. conjugatum* and *Imperata cylindrica,* which are aggressive species, will provide most of the weed cover in future years in fields currently planted to rice.

To our knowledge, this is the first time *Axonopus compressus* and *Solanum cumingii* have been reported as weeds of rice in the Philippines. □

Weeds gowing in association with rice, citrus, and sweet potato in Real, Quezon, Philippines, Jul-Sep 1984.

Weed species	Rice		Citrus	Sweet potato
	Sloping land	Flat land		
Ageratum conyzoides	–	–	–	√
Axonopus compressus	√	√	–	–
BIumea sinuata	√	√	√	√
Crassocephalum crepidioides	√	√	√	√
Cyperus halpan	–	√	–	–
Emilia sonchifolia	–	–	√	√
Imperata cylindrica	√	√	–	–
Paspalum conjugatum	√	√	√	√
Pseudoelephantopus spicatus	–	√	–	–
Solanum eumingii	√	√	–	–

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OTHER PESTS

Golden apple snail: a pest of rice

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The golden apple snail *Pomacea canaliculata,* an aquatic gastropod originating from South America, was introduced recently in the Philippines as a culture material to be farmed in