Effect of 3 methods of raising rice seedlings on leaf water potential and fresh weight, 1989. [a]

Seedling age (d)	Leaf water potential (Pa)				Fresh weight (g/plant)			
	WN	DN	DWN		WN	DN	DWN	
			10 d	20 d			10 d	20 d
35	7.7	1.1	1.05		1.1	1.2	1.2	
45	1.0	1.1	1.06	1.04	1.4	1.2	1.7	1.7
55	1.0	1.1	0.95	0.95	1.2	1.3	1.4	1.7
65	0.96	1.2	0.97	1.04	3.2	2.3	2.6	2.6
LSD (0.05) =	0.6			LSD (0.05) =	0.3			

[a] Mean of 5 cultivars or lines. WN = wet nursery; DN = dry nursery; DWN = dry-wet nursery.

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Effect of N application timing on ratoon rice

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N rate and frequency are critical factors in managing rice ratoon crops. We studied split N application during 1988 wet season.

The ratoon crop received 100-50-50 kg NPK/ha. N was applied to medium-duration rice varieties Ponni and Bhavani as complete basal immediately after harvest of main crop; half as basal and half 30 d after harvest of main crop (DH); and one-third as basal, one-third 15 DH, and one-third 30 DH. The experiment was laid out in a factorial randomized block design with three replications. Soil was sandy clay loam with pH 7.3.

Effect of N application timing on ratoon yield. Madurai, India, 1988 wet season.

Variety	Yield (t/ha) at given time of N application			Mean yield (t/ha)
	Complete basal	Two splits	Three splits	
Ponni	2.0	1.7	1.6	1.8
Bhavani	3.0	2.7	2.6	2.8
Mean	2.5	2.2	2.1	
	SE±	LSD (0.05)		
Variety	0.118	0.263		
Time of N	0.142	0.294		
Interaction	0.203	ns		

Bhavani produced significantly higher ratoon yield (2.8 t/ha, 50% of its main crop yield). All N as basal produced a ratoon yield of 2.5 t/ha (see table). Basal application significantly improved all yield attributes and grain and straw yields, probably because of early sprouting and healthy ratoon tillers. □

Yield of rice sown in standing water

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In large areas of Assam, flooding frequently destroys the wet season rice crop transplanted in Jul. In such situations, farmers direct seed rice in Sep, when floodwaters have receded. We experimented with sowing in standing water, to move direct seeding to earlier in the season.

Cultivars Culture 1 and CR666-68 were tested on a clay loam soil during 1988 wet season. Two seed treatments were used: soaking in water 12 h and soaking until seed sprouted. Seeds were sown in 12 cm standing water on 25 Aug; water depth was maintained for 12 d.

In both varieties, nonsprouted seed germinated well and more seedlings emerged better than those from sprouted seed. Panicle weight and grain yield were significantly higher with nonsprouted seeds (see table). Panicles/m^2 did not differ significantly.

Yield differences were possibly

Influence of underwater sowing on yield and yield-related attributes of rice. Titabar, India, 1988.

Variety	Method	Panicles (no./m^2)	Panicle weight (g)	Grain yield (t/ha)
Culture 1	Nonsprouted	192	1.94	2.2
Culture 1	Sprouted	164	1.88	1.6
CR666-68	Nonsprouted	190	1.89	2.0
CR666-68	Sprouted	166	1.86	1.5
LSD (0.05)		24	0.09	0.2

due to floating or clumping of sprouted seeds, resulting in scattered or dense stands. Nonsprouted seeds settled on the underwater soil surface and developed comparatively more vigorous seedlings. The technology is being tested under natural conditions in farmers' fields.

Other researchers have found that seeding into standing water can be done only when water temperature is low and oxygen level high. Studies on water temperature and oxygen level are needed. □

Herbage production from deepwater rice in farmers' fields

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We sampled eight deepwater rice farmers' fields for herbage and grain yield at Amphur Bangpahan and Amphur Maharat, Ayutthaya (central plain) in 1988 wet season. Two treatments–cut and not cut–were arranged in random complete block design with 10 replications. The varieties and agronomic practices of the farmers are shown in Table 1.

In the cut plots, leaves were removed at the collar of the last fully developed leaf during vegetative growth. Average herbage harvest was 1 t dry matter/ha. Leaf herbage protein content has been shown to be high.

Leaf removal did not significantly affect agronomic characteristics, yield components, and grain yield (Table 2). On average, panicle number, yield, and harvest index were improved by cutting.

These results indicate that in the floodplain of Thailand, where pasture and herbage availability is minimal during the rainy season, it is possible to harvest herbage from deepwater rice without decreasing grain yields. □

Table 1. Deepwater rice varieties and farmers' agronomic practices. Central Thailand, 1988-89 wet season.

Location	Variety	Seeding rate (kg/ha)	Sowing date	Emergence	Cutting date	Water level (cm)	Maximum water		Harvest date
							Depth (cm)	Date	
Bangpahan	Khao Puang Nak	150	15 May	25 May	15 Sep	60	90	20 Oct	15 Jan
Bangpahan	Luang Pratharn	120	28 May	10 Jun	25 Aug	15	45	15 Oct	12 Jan
Bangpahan	Khao Kaset	120	30 May	12 Jun	11 Aug	15	40	15 Oct	25 Dec
Bangpahan	Khao Prakuad	120	30 May	12 Jun	02 Aug	20	40	15 Oct	25 Dec
Maharat	Khao Prakuad	150	02 Jul	10 Jul	10 Sep	8	30	20 Oct	13 Jan
Maharat	Khao Lod Chong	150	10 May	20 May	25 Jul	57	195	15 Oct	13 Jan
Maharat	Pin Gaew 56	150	07 May	15 May	19 Jul	0	180	30 Oct	07 Jan
Maharat	Sai Bua	150	07 May	15 May	02 Aug	60	180	20 Oct	05 Jan

Table 2. Grain yield, herbage yield, and production components of deepwater rice with and without herbage harvest. Ayutthaya, Thailand, 1988-89 wet season.

Location	Variety	Herbage (t/ha)	Grain yield (t/ha)		Panicles (no./m^2)		Spikelets /panicle		Fertility (%)		1000-grain wt (g)		Harvest index		Height (cm)	
			Control	Cut	Control	Cut	Control	Cut	Control	Cut	Control	Cut	Control	Cut	Control	Cut
Bangpahan	Khao Puang Nak	0.90	2.3	2.3	106	112	151	156	92	92	24.6	24.9	0.20	0.21	248	239
Bangpahan	LuangPratharn	0.95	2.2	2.6	113	129	122	114	89	88	24.4	24.2	0.24	0.30	153	147
Bangpahan	Khao Kaset	0.80	4.0	4.1	139	141	144	130	93	94	28.6	29.2	0.35	0.40	186	171
Bangpahan	Khao Prakuad	0.99	3.1	3.3	129	139	126	115	94	95	28.4	29.2	0.31	0.34	168	156
Maharat	Khao Prakuad	0.95	1.9	1.9	106	106	88	96	83	84	27.5	27.0	0.31	0.35	119	125
Maharat	Khao Lod Chong	1.33	0.9	1.2	68	77	97	104	91	92	26.8	26.9	0.25	0.25	193	207
Maharat	Pin Gaew 56	1.06	2.2	2.2	99	103	112	109	92	93	25.8	26.1	0.18	0.19	296	291
Maharat	Sai Bua	0.96	2.0	1.8	95	88	153	136	92	93	26.0	25.6	0.20	0.20	284	282
	Average	0.99	2.3	2.4	107	112	124	120	91	91	26.5	26.6	0.26	0.28	206	202

Soil fertility and fertilizer management

Effect of topdressing potash on rice nutrient uptake and yield

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We studied the effect on irrigated rice of topdressing potash through NK granules (27-0-27) during 1983-84 wet (WS) and dry (DS) seasons. Soil was Typic Haplustalf with pH 8.1 and 328 kg available N/ha, 13.6 kg P/ha, and 530