

Seedling emergence in upland rice

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Two weeks after seeding, most varieties seeded at below field capacity (35% soil moisture 7 d after soil reached field capacity) had higher seedling emergence than those seeded at field capacity (46% soil moisture). Seedling emergence was seriously affected when seeding was at lower

moisture level — 16% soil moisture 14 d after the soil reached field capacity. But even at this moisture level, most modern varieties emerged better than traditional upland varieties (see table).

Shoot length was far better at 35% soil moisture than at 46%. Even at 16% soil moisture, shoot length was better than at field capacity. Root length was better in most modern varieties at both reduced moisture levels than at field capacity. In most traditional varieties, root length was similar at all moisture levels. □

Seedling emergence and growth at different moisture levels of direct seeded upland rice.^a Bangladesh Rice Research Institute, Dhaka, Bangladesh.

Variety	Seedling emergence ^b (%)			Shoot length ^c (cm)			Root length ^c (cm)		
	FC	7 DAF	14 DAF	FC	7 DAF	14 DAF	FC	7 DAF	14 DAF
<i>Modern</i>									
BR1	80	85	57	14	22	13	4	6	3
BR2	56	54	39	15	24	22	4	4	6
BR3	82	72	60	11	24	16	5	6	5
BR6	86	91	52	10	22	16	4	4	5
BR7	50	72	56	12	24	16	5	5	5
BR8	62	68	26	12	25	19	6	5	4
BR9	90	84	65	14	26	15	4	6	5
IR20	63	81	44	12	18	13	5	4	4
<i>Traditional</i>									
Hashikalmi	100	100	25	15	25	20	4	7	4
Dharial	72	78	30	12	26	18	4	5	4
Kataktara	84	94	36	11	26	18	5	5	5
Marichbati	76	74	32	11	25	19	6	5	4
Panbira	66	89	32	11	20	14	4	4	4
Pankhiraj	75	80	51	13	22	16	5	5	5
Surjamukhi	85	80	29	15	24	18	5	6	5

^a FC = field capacity (46% moisture), 7 DAF = 7 d after the soil reached field capacity (35 % moisture), and 14 DAF = 14 d after the soil reached field capacity (16% moisture). ^b Av of 3 replications. ^c Av of 3 replications, 10 seedlings each.

Effect of phosphorus on lowland rice yield

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We studied the effect of the timing of phosphate application on rice variety Sita (130-135 d duration) in 3 wet season trials in a randomized block design with 8 treatments and 4 replications. Soil was a dark grey heavy clay with poor drainage, medium fertility (0.74% organic C, 0.07% total N, 22 kg available P/ha, 185 kg available K/ha), and CEC 32.2 meq/100 g.

Applying P basally yielded best (see table).

Effect of P application timing on panicles/m² and yield.^a Patna, India.

Treatment ^b (kg P/ha)	Panicles/m ²	Grain yield (t/ha)
No P (control)	312	3.95
26 as basal	374 a	4.61 a
26 at 10 DT	359 ab	4.45 abc
26 at 20 DT	357 ab	4.56 ab
26 at 30 DT	353 c	4.19 bcd
26 at 40 DT	331 d	4.20 bcd
26 at 50 DT	326 de	4.06 cd
26 at 60 DT	321 de	4.07 cd

^a In a column, means followed by a common letter are not significantly different at 5% level.

^b DT = days after transplanting.

It appears that early application of P enhanced early tillers and that these tillers were more productive. □

Effects of green leaf manure on soil fertility and rice yield

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Nitrogenous fertilizers are essential for higher rice yields. However, it is well known that the yield potential of a field decreases with continuous fertilizer applications. Maintaining soil fertility is considered to be linked to increased microbial biomass and microbial activity.

Soil enzymes, particularly dehydrogenases, are derived primarily from soil microorganisms. The level of soil enzymes may be an indicator of general microbial populations and activities.

We compared the effects of various green leaf manures and a nitrogenous fertilizer (urea) on rice yield and on soil fertility status.

The test soil was clay loam with a pH of 7.0, CEC 36 meq/100 g, 0.75% organic C, 0.13% total N, 70 kg available P/ha, and 92 kg exchangeable K/ha.

Fresh leaves of glyricidia *Glyricidia maculata*, neem *Azadirachta indica*, and pungam *Pongamia glabra*, and urea were applied at 100 kg N/ha and trampled. IR20 seedlings were transplanted immediately. Soil samples were collected 75 d after transplanting and dehydrogenase activity assessed.

Green leaf manures and urea were equally effective in increasing yield (see table). But only green leaf manures increased soil microbial activity, indicating higher soil fertility status. □

Comparative efficacy of green leaf manure and urea in increasing yield of rice and soil microbial activity, Aduthurai, India.

Treatment	Grain yield (t/ha)	Microbial activity (dehydrogenase activity in units; 1 unit = optical density of 0.001 at 546 nm)
Glyricidia	4.31 ± 0.13	100.0 ± 24.5
Neem	4.87 ± 0.53	82.5 ± 20.6
Pungam	4.59 ± 0.18	62.5 ± 9.6
Urea	4.81 ± 0.19	22.5 ± 5.0
Control (no N)	2.28 ± 0.11	17.5 ± 5.0