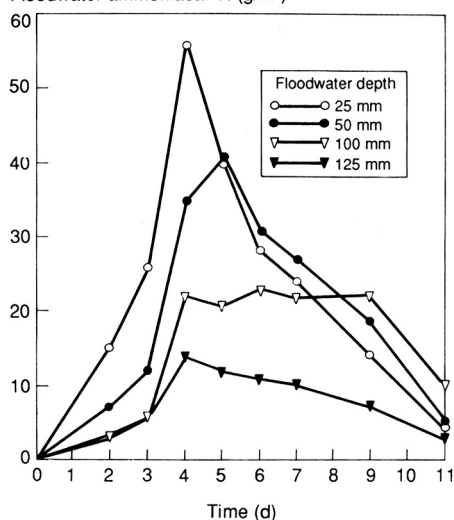


Floodwater ammoniacal-N (g/m³)

2. Effect of floodwater depth on ammoniacal-N concentration in the water. Ludhiana, India.

intervals using a manifold and estimated by absorbing in 2% boric acid-mixed indicator solution. Floodwater samples also were analyzed for ammoniacal- and urea-N.

Floodwater depth significantly affected rate of NH₃ volatilization in flooded Ludhiana soil (Fig. 1). At 4 d after application, 1.8% of added urea was volatilized in 25-mm-deep water, but only a trace was volatilized in deeper water. At 11 d, NH₃ volatilization was 7.5, 4.5, 1.8, and 0.5% of added urea in 25, 50, 100, and 125 mm-deep-water, respectively.

Ammoniacal-N concentration in the floodwater 4 d after urea application was greatest at 25-mm-deep water and least at 125 mm (Fig. 2). □

Efficiency of modified nitrogen fertilizers in rice on partially reclaimed saline soil

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We compared sulfur-coated urea (SCU), urea supergranules (USG), and prilled urea (PU) at 0, 29, 58, 87, and 116 kg

Table 1. Effect of source and rate of N on grain yield of rice. Dalipnagar, India, 1982-83 wet season.

N (kg/ha)	Yield (t/ha)			
	PU	USG	SCU	Mean
0	1.6	1.6	1.6	1.5
29	2.0	2.3	2.4	2.2
58	2.5	2.8	2.8	2.7
87	2.9	3.2	3.2	3.1
116	3.3	3.5	3.5	3.4
Mean	2.5	2.7	2.7	

LSD (0.05) 0.187

N/ha in rice on partially reclaimed saline soil at the Dalipnagar research farm during 1982-83 wet season.

Experimental soil was loamy with pH 8.7, EC 183 dS/m at 25 °C, 0.039% total N, 135-8-214 available NPK/ha.

Treatments were PU best split, USG deep placed (10-12 cm soil depth) 1 wk after transplanting Jaya variety, and

Table 2. Influence of source and N rate on N recovery.

N (kg/ha)	N recovery (%)			
	PU	USG	SCU	Mean
29	42.86	63.21	69.28	58.45
58	40.10	54.30	55.75	50.05
87	39.00	46.75	47.60	44.45
116	37.00	41.55	42.15	40.23
Mean	39.74	51.45	53.69	

SCU broadcast and incorporated at transplanting. P and K were applied uniformly at 26-25 kg/ha. ZnSO₄ was applied to the nursery bed at 25 kg/ha.

SCU and USG were significantly superior to PU at all N levels (Table 1), with a greater difference at lower N levels.

N recovery was highest with SCU (Table 2). Recovery of N decreased linearly with increase in N level. □

Composting with rice straw

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Rice straw is an important source of organic matter in rice-growing areas, but applying it directly into soil has a number of limitations. Composting appears to be an alternative.

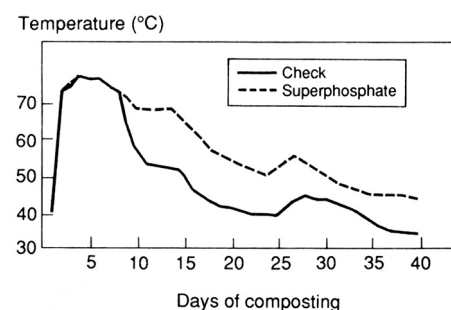
Composting originated in upland cropping areas, where the basic raw materials are crop stovers other than rice straw and farmyard manure (primarily horse manure). We tested composting with rice straw and pig manure (pigs are the basic livestock in rice-growing areas in China).

The essential factors for composting were defined as optimal C:N ratio of around 40 in raw materials; chopped rice straw, mixed with grasses and leguminous leaves or tender tips, if available; pig manure or other farmyard manure; superphosphate at 3% of total raw material weight; appropriate moisture and aeration conditions.

The temperature at the center of the pile was raised to 70 °C across 34 d,

maintained for about 1 wk, then dropped gradually (see figure). Superphosphate showed some effect on keeping temperatures high, resulting in better compost maturity. Composting was completed in 45 to 60 d when N content was 0.3-0.4% and C:N ratio was 20.

The compost was used as basal manure for double-cropped rice. Table 1 gives the recovery of nutrients, Table 2 shows effect of rice straw compost on yield. Yields with rice straw compost were comparable to yield with conventional manure.



Temperature during composting. JAAS, Nanjing, Jiangsu, China.

Table 1. Recovery of C and N.^a JAAS, Nanjing, Jiangsu, China.

Treatment	In raw materials		In compost				
	OM (kg)	N (kg)	C:N	OM (kg)	Recovery	N (kg)	Recovery
Local manure	195	2.93	23.4	80	0.41	1.88	0.64
Superphosphate	190	2.78	28.3	108	0.57	2.10	0.76

^a OM = organic matter.

Basic problems in using compost follow:

- 1) Unavoidable nutrition losses due to aeration process. Carbon losses ranged from 43 to 59%, N losses 24-36% (Table 2). The addition of superphosphate tended to reduce losses somewhat.
- 2) Labor to collect raw materials, prepare compost, transfer compost to field, and broadcast at 15 t/ha was estimated as 75 labor d/ha.
- 3) To guard against negative effect on rice seedlings, N fertilizer must be applied at 30 kg N to 10 t compost/ha. □

Table 2. Effect of rice straw compost on yield of double-cropped rice.^a

Treatment	1st crop		2d crop	
	Yield (t/ha)	Increase (%)	Yield (t/ha)	Increase (%)
Local manure	5.8	—	4.0	—
Compost 1	5.9	2.8	4.8	19.9
Compost 2	6.0	3.5	4.5	10.9

^a Local conventional manure = basal, N 0.153%, 45 t/ha (68.85 kg N); P₂O₅ 0.148%. Compost 1 = basal, N 0.302%, 15 t/ha (45.3 kg N); P₂O₅ 0.138%. Compost 2 = basal, N 0.285%, 15 t/ha (42.75 kg N); P₂O₅ 0.131%. In 1st crop, basal fertilizer for all treatments = 63.75 kg N/ha, topdressed fertilizer = 86.63 kg N/ha. In 2d crop, basal fertilizer for all treatments = 91.88 kg N/ha. Soil characteristics: irrigated lowland, clay loam, pH 6.8, 3.13% OM, 0.17% N, 0.156% P₂O₅, 17.4 ppm Olsen-P, 93.1 ppm NH₄Ac-K, CEC 20.3 meq/100 g.

Disease management

Effectiveness of five fungicides on rice sheath blight (ShB)

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ShB caused by Rhizoctonia solani Kuhn has become a problem in modern high-yielding varieties in Iran. We tested five fungicides for disease control (see table). IR28 (Amol 2) was transplanted 2 May at 18 × 22 rows in 4- × 6-m plots. Herbicide was applied at 6 liters/ha 6 d after transplanting. Fertilizer was applied at 200 kg urea, 100 kg ammonium phosphate/ha 12 May simultaneously with transplanting, and 100 kg urea/ha was applied 19 Jul. All fungicides but IBP were applied with the sprayer delivering 1,000 liters/ha, IBP was broadcast by hand. Treatments were replicated five times in a randomized complete block design. Fungicide applications were at booting and 10 d later, at heading. Degree of damage (DD) and degree of severity (DS%) were rated at harvest 17 Sep, and 80 hills/plot were harvested the

Effectiveness of fungicides on rice ShB. Bandar-Angali, Iran.

Treatment	Rate/ha	DD	DS (%)	Yield (t/ha)
Control		14.9	37	6.6
Iprodione ts 52.5PW	525 g	8	9.7	7.3
Validamycin 3% liquid	60 ml	3	7.2	7.4
Mepronil 50PW	500 g	6.8	1.1	6.9
Benomyl 50PW	500 g	5.2	12.7	6.3
IBP 17G	6800 g	2.5	6.1	7.6

day after. Grain was dried at room temperature and weighed. IBP, mepronil, validamycin, and

iprodione effectively controlled ShB. Yields were higher with IBP, validamycin, and iprodione. □

Cross-season perpetuation of bacterial blight (BB) pathogen in Haryana, India

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We studied the perpetuation of Xanthomonas campestris pv. oryzae Dye in infected leaves and artificially inoculated grains. Naturally infected leaves of variety Jaya were collected during the 1987 wet season, chopped into small pieces, and soaked in water for 30 min. The bacterial suspension was separated and injected in rice variety Jaya at 1 ml/boot. Grain was collected separately from inoculated boots and infected leaves, dried in the shade, and

kept at room temperature in the laboratory. In 1988 wet season, inoculated grains were germinated on blotter paper, in pots, and in the field. Seedlings were tested for bacterial ooze at 1 wk (from blotter paper) and 10 d (from pots and field). Seedlings grown in pots and transplanted in the field did not produce any symptoms of kresiek and leaf blight. A bacterial suspension prepared from stored infected leaves was used to inoculate TN1, Jaya, and Basmati 370 at maximum tillering in Aug 1988. Disease developed in all three varieties. These tests show that X. campestris pv. oryzae perpetuates only in infected leaves, not on grain. □