

## Effect of *Sesbania* green manure on water management and yield of lowland rice

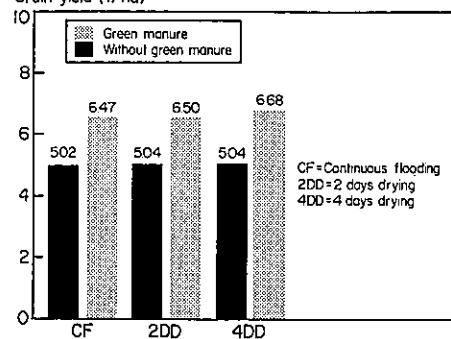
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The importance of green manure in increasing soil productivity has been recognized from early times. The benefits credited to them include supply of organic matter and N, mobilization of soil P and other nutrients, and improvement in the microbiological and physical properties of soils. Recent research at the PAU farm has shown that apart from supplying green matter equivalent to 120 kg N/ha in rice, 2-mo-old *Sesbania* (*Sesbania aculeata*) incorporated into the soil lowered bulk density and significantly increased infiltration rate of the soil. This promoted our interest to study the effect of *Sesbania* green manure on water management because irrigation is a costly input in rice production in Punjab. We realized the importance of this because of the present recommendation of applying irrigation 2-4 d after the ponded water has infiltrated into the soil where green

manure is not applied in rice culture.

The soil was loamy sand (Typic Ustochrept) with a percolation rate 5 mm/h, pH 8.4, EC 0.15 mmho/cm, 0.34% organic carbon, and 0.06% of total N. *Sesbania* green manure crop was grown on a separate piece of land from May to Jul 1985. The crop was harvested, chopped, and incorporated into the experimental plots 1 d before transplanting on 20 Jul 1985. All but the no-green-manure plots received *Sesbania* at 25 t green matter/ha, equivalent to 125 kg N/ha. The experiment was a split-plot design with water regimes as main plots and green manure and N levels as subplots, in three replications. The water regimes were continuous flooding (CF), 2 d drying (DD), and 4 DD. Urea N levels were zero and 120 kg N/ha applied in 3 equal splits: at transplanting, 21 and 42 d after transplanting. At last puddling, 26 kg P and 50 kg K/ha were applied to all plots. In the drying treatments, continuous flooding was maintained for 3 wk after transplanting and thereafter irrigation was applied 2 or 4 d after the ponded water had infiltrated into the soil of plots with and without green manure. This was carried out up to 2 wk before maturity to

Grain yield (t/ha)



Effect of water management in the presence of *sesbania* green manure on yield of lowland rice.

facilitate harvesting. The crop was harvested at maturity and grain yield determined at 14% moisture content.

Averaged for water regimes, grain yield data indicated that *Sesbania* green manure alone gave 5.8 t/ha yield as compared to 6.3 t/ha by applying 120 kg N/ha as urea. Furthermore, averaged for N levels, grain yields of the three irrigation treatments were on par with and without green manure treatments (see figure). This suggests that irrigating the plot 4 d after the ponded water has infiltrated into the soil can be safely practiced even with *Sesbania* green manure in lowland rice. ☞

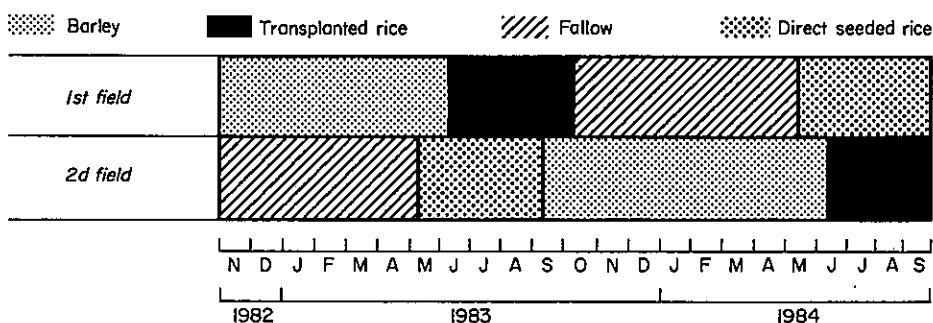
## Barley as a second crop in rice areas of Kizilirmak Valley, Turkey

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In Turkey, direct-seeded rice is sown in May and harvested in Sep-Oct.

Depending on the region, winter cereals are sown in Oct and harvested in early Jul. Because direct-seeded rice cannot follow winter cereals, rice must be transplanted to use the fields which are fallow Oct-May.

Experiments to evaluate rice seeding methods that would allow growing barley as a second crop were carried out in farmers' fields at Çorum-kargi,



Use of experimental fields in Kizilirmak Valley, Turkey.

Kizilirmak Valley, an important rice-growing location.

The experiments started with barley in fall 1982 and ended with rice in 1984 (see figure). The experimental design was split plot with four replications. Main plots were rice cultivars

Krasnodarsky 424 and Ribe; subplots were P rates (0, 18, 35, and 53 kg P/ha). Rice planting methods were direct seeding and transplanting.

The soil of the experimental field was heavy textured and slightly alkaline (pH = 8.0), with medium lime (10.5%)