Rice Culture in Central Oklahoma for Domestic Use (A Sequel and Correction)

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Originally, partially germinated rice (*Oryza sativa*) was broadcast onto a prepared seedbed about May 10th, the earth was lightly raked to protect the rice from birds, and the field subjected to a shallow water flood (1). The started rice competes well with weeds, but the broadcasting of seed provides no clear place to stand during weeding. Although weed control by hand was moderately successful during the first few years of rice cultivation, aquatic weeds gradually increased, making it difficult to avoid uprooting rice plants during weeding. Thus, this cultural practice became less effective.

In December 1983, a pipeline discharged saturated brine onto 600 m² of land, including the rice paddy. Reclamation efforts began in the fall of 1984, with applications of manure and gypsum (200 and 100 tonnes/ha respectively), and deep plowing and subsequent water flooding. By the end of 1986, bermudagrass (*Cynodon dactylon*, a salt-tolerant species) was established in the area. In 1987, test plots demonstrated effects of residual brine, but indicated that culture of rice was again feasible.

In China, I saw rice that had been planted as seedlings in rows and weeds removed by hand, even when weed density was inconsequential to production of the current season; the reduced production of weed seeds helps to control subsequent weed population. The planting of seedlings gives the rice a strong head-start over weeds and, in the mild climates of China's rice-growing areas, also enables two or three harvests each year.

For 1988, rice was sown in flats on April 28th, and left in a coldframe to sprout. On May 29th, the rice (in the three-leaf stage) was transplanted to the paddy in rows 15 cm (6") apart, and with 12.5 cm (5") between settings in a row. Two to four plants were placed at each position to allow for possible loss of some seedlings. A shallow water flood was maintained subsequently.

Though transplanting rice by hand is tiresome, advantages of setting well-sprouted plants into rows were immediately apparent. Relatively warm weather at the end of May and thereafter facilitates rapid growth of rice seedlings, and provides vigorous competition for weeds. Weeds were nearly eliminated by hand during a few passes through the paddy, with no damage to the rice. After six weeks, rice shade retarded weed growth, and the only substantial weeding activity required toward the end of the season was at the paddy margins.

Table 1 compares 1988 and 1989 yields. Mars variety alone was planted in 1989 with only one or two seedlings at each location. Seed was planted in rows in about 10% of the area. While row-planting of seed is much faster than transplanting of seedlings, dominance of rice over weeds is less easily established later on. I will probably use the transplanting method in the future.

The September 1989 crop weighed 7.583 kg, which corresponds to 3,909 pounds per acre. The reduced yield (compared with 1988) is partly due to the smaller number of plants set out. Also, while summer 1988 was slightly warmer than average, the average monthly temperature during June-September 1989 ranged from 2.5 to 5.5 °F below the long-period average. Residual salinity also has probably reduced current yields. At the start of the 1988 season, conductivity in the surface soil was 16,770 μS/cm and this declined under constant flood to 6,870 and 5,850 at the ends of the 1988 and 1989 seasons, respectively. Yield reduction often becomes apparent in rice when conductivity of the soil exceeds 3,000 μS/cm (2).

TABLE 1. Rice yields from a 17.2-m² plot in McClain County, Oklahoma

	Actual Yield (kg)		Areal Yield (kg/ha)	
Year	Mars	Tebonnet	Mars	Tebonnet
1988	3.26	4.24	4790	4070
1989	7.54	—	4378	—

Maximum areal yield before brine discharge: 5490 kg/ha

REFERENCES

1. E. Kessler, Proc. Okla. Acad. Sci. 67: 36-38(1980).

2. S.K. DeDatta, *Principles and Practices of Rice Production*, John Wiley & Sons, NY, 1981, p. 371.