

Nutrient use efficiency and upland rice yield

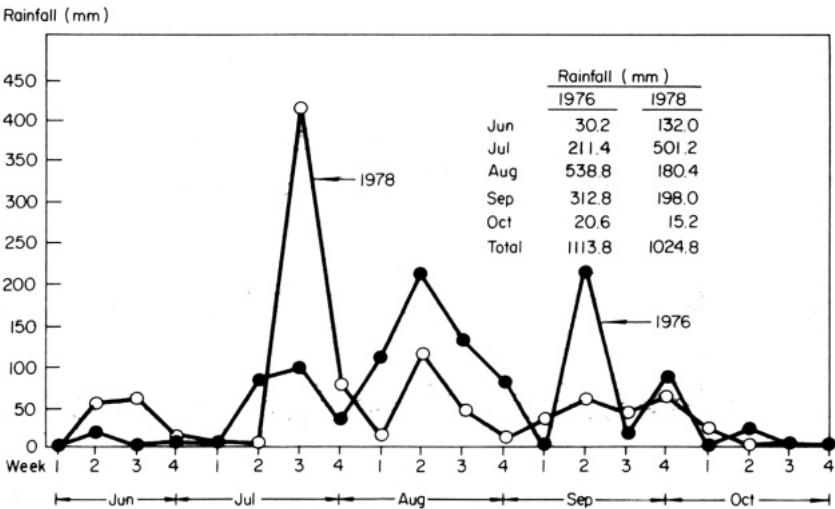
T. N. Singh, G. Singh, and H. P. Singh, Crop Physiology Department, Narendra Dev University of Agriculture and Technology, Faizabad-224001 (U.P.), India

Eastern Uttar Pradesh is a major rice growing area which often has drought that makes rice culture risky. Average rainfall is about 1,000 mm, but distribution is erratic.

A field experiment in sandy loam soils to determine varietal response to added nitrogen was conducted in 1976 and repeated in 1978 at Faizabad. Eleven semi-dwarf and tall rice varieties were grown at 0, 20, 40, 60, and 80 kg N/ha. Phosphorus (13 kg/ha) and potassium (25 kg/ha) were applied at sowing. Nitrogen was applied basally in two equal splits at sowing and tillering. Plots were direct-seeded at 100 kg/ha in rows 20 cm apart after the first rains in July. Figure 1 shows weekly rainfall distribution during the two seasons.

Grain yield in 1976 increased at all nitrogen application levels. IET826 (3.3 t/ha) yielded highest, followed by IET2918 (3.0 t/ha) and FH109 (2.8 t/ha). N22 and Brown Gora yielded 2.5 and 2.4 t/ha. Other variety yields were intermediate.

In 1978 IET826 (2.6 t/ha) yielded



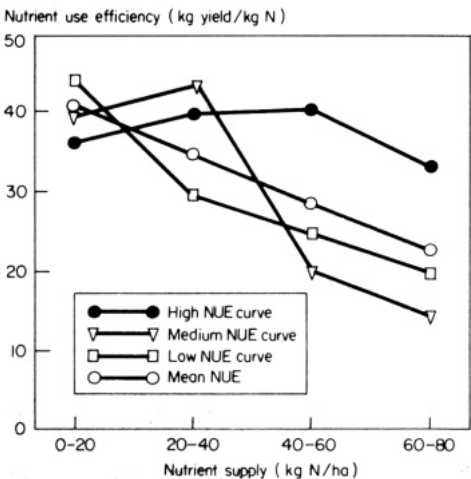
1. Distribution pattern of rainfall at Faizabad, India, 1976 and 1978.

highest, followed by IET1444 (Rasi) (2.5 t/ha). N22 had the lowest yield – 2.1 t/ha.

Nutrient use efficiency (NUE) was calculated for each genotype by dividing the quantity of additional grain yield produced by the nitrogen applied (Fig. 2).

IET826 and IET1444 (Rasi) had a high NUE curve; IET2918, IET2912, Brown Gora, KR-5-142, and Cauvery had a medium NUE curve; and IET3226, FH109, N22, and IET2232 (Narendra 1) had a low curve. □

2. Nutrient use efficiency (NUE) trends of selected upland rice strains, Faizabad, India, 1976 and 1978.



Growth rate of azolla in Colombia

W. J. Zimmerman, Division of Biological Sciences, University of Missouri, Columbia, Missouri 65211

Azolla quickly adapted to simulated in situ conditions when transferred from slow-growing maintenance or storage cultures. Although storage cultures had near-stationary growth rate, the azolla achieved normal growth rate within a week after transfer into simulated environments.

Six of 11 Colombian isolates of *Azolla filiculoides* (provisional designation) were tested at the University of Florida, Gainesville. During the first week after transfer, most isolates doubled fresh

weight (FW) in 2 days and dry weight (DW) in less than 72 hours, when grown at moderate light levels (15 klux, 18-hour days) and temperature (26°C day, 22°C night) (Table 1). Doubling increased to 3 days for FW and 4 days for DW the second week after inoculation, probably because of crowding.

Table 1. Isolate doubling times.

Isolate	Doubling time (days)			
	1 wk		2 wk	
	FW	DW	FW	DW
Monteria-2	2.40 ± 0.44	2.26 ± 0.35	2.45 ± 0.20	2.81 ± 0.30
Monteria-3	2.17 ± 0.11	2.11 ± 0.08	3.36 ± 0.24	4.23 ± 0.22
CIAT	2.00 ± 0.04	2.06 ± 0.06	—	—
Amazon-C	1.92 ± 0.27	1.96 ± 0.21	—	—
Amazon-R	2.01 ± 0.11	1.93 ± 0.13	3.22 ± 0.54	4.24 ± 0.99
Amazon-Y	1.96 ± 0.21	1.88 ± 0.14	3.33 ± 0.28	3.85 ± 0.46

Growth rate of the storage culture inoculum, and the conditions of the storage environment affected turnover time and final biomass harvests. In Monteria-3 FW doubling average was 3.20 times and the DW doubling was 3.41 times during the first 7 days of the growth test when the inoculum