Ecosystem-wise comparison of morphological traits and grain yields in rice varieties

Overall mean height of plants in varieties released was relatively higher in kharif crop than that of crop grown in rabi season. Plants were semidwarf in stature in varieties released for hill rice irrigated/upland, irrigated early, mid-early or medium maturity and rainfed shallow lowland ecosystems. It was semitall in those of rainfed upland, scented rice and semideep water rice varieties.

In general tillers and tillers with panicles were higher in kharif crop than that of rabi crop of all the varieties studied. In kharif, hill rice irrigated/upland, irrigated early maturity and deep water rices tests showed 20-22 tiller and 21-28 tillers with panicles.

Grain weight was more in rabi (94 to 124 g/10 hills) except deep water rices (83 g/10 hills) compared to kharif (89 to 108 g/10 hill), although chaff remained between 3 to 5 chaff/10 hills in the two seasons in all the ecosystems. In rabi seasons, panicle weight was slightly higher in the varieties, but the straw weight was lower. Similar trends were evident in the numbers of grain or chaff/panicle.

Increased or similar grain yields/ha were recorded in all rice varieties in rabi seasons compared to kharif seasons. Overall data across seasons (both kharif and rabi seasons) indicated that mean grain yields were below 3 t/ha in two varieties Pratibha and Vajram; 3-4 t/ha in 51 varieties; 4-5 t/ha in 41 varieties; and 5.0-5.7 t/ha in Arvindar, Vikramarya, Co48, Phouoibi, PR114 and TKM9.
Figure 1. Trend in morphological traits of plant height, tiller and tiller with panicles, grains and chaff weight/10 hills, panicle and straw weight/hill in crops rice varieties of different ecosystems grown in kharif and rabi seasons.
IRE = irrigated early maturity; IRME = irrigated mid-early maturity; IRM = irrigated medium maturity; RUP = rainfed upland; RSL = rainfed shallow lowland; SCR = scented rice; SDW = semideep ware (30-50 cm water depth); DW = deep water (>50-100 cm water depth); HRIR/HRUR = hill rice irrigated/upland
Figure 2. Trend in morphological traits – weight and numbers of grains and chaff per panicle, and grain yields in rice varieties of different ecosystems grown in kharif and rabi seasons.

IRE = irrigated early maturity; IRME = irrigated mid-early maturity; IRM = irrigated medium maturity; RUP = rainfed upland; RSL = rainfed shallow lowland; SCR = scented rice; SDW = semideep ware (30-50 cm water depth); DW = deep water (>50-100 cm water depth); HRIR/HRUR = hill rice irrigated/upland