

Weed suppressive ability and yield of rice germplasms under aerobic soil condition

ABSTRACT

Considering yield stability and yield penalty, adoption of competitive cultivars in a sustainable weed management strategy would be beneficial from both economic and environmental view points. This study involving thirteen rice germplasm grown under weedy and weed- free conditions was conducted to compare weed suppressive ability and yield potential under aerobic soil conditions, and determine suitable cultivars for countries in tropical Asia. Germplasm varied widely in yield ability, AERON 1 topped the list with a modest figure of only 2.72 Mg/ha. Across the germplasm, mean weed pressure was as high as 244 g/m² against 596 g/m² in weed monoculture. Rice germplasm, on average, reduced weed pressure by almost 59%. AERON 1 emerged as the most suppressive and decreased weed dry weight by 76%. Weed-inflicted relative yield loss ranged from 23 to 53% and AERON 1 allowed least yield penalty. In general, traits related to faster early height growth rate, vigor, and above ground crop biomass were strongly (negatively) associated with weed biomass. Tillering ability was correlated positively with weed biomass, while plant erectness was not correlated with weed biomass. No trade off between weed suppressing ability and yield potential was traced. The present study confirms the feasibility of weed competitive cultivars as the key tool for sustainable weed management, and suggests breeding for weed suppressive aerobic rice by combining traits associated with weed competitiveness.

Keyword: Aerobic rice; Crop vigo; Plant erectness; Weed competetiveness