

Article title	Field screening of diverse rice genotypes for weed competitiveness in irrigated lowland ecosystems
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Abstract	<p>Weeds cause considerable yield losses in irrigated rice in West Africa, particularly where sub-optimal crop management or limited resources hamper production. Because of the recent focus of regional breeding programs in West Africa on a wide diversity of interspecific (<i>O.sativaindica</i>×<i>O.glaberrima</i>) and intraspecific (<i>O.sativa</i>×<i>O.sativa</i>) crosses for lowland systems, new genotypes with promising yield potential and putatively improved weed competitiveness are now available. Our study intended to establish a screening methodology for weed competitiveness in irrigated lowlands, to evaluate weed competitive abilities of diverse rice genotypes, and to relate several morphological plant characteristics with competitive abilities. A selection of 25 cultivars and advanced breeding lines was grown under irrigated conditions during the 2000 wet season (WS) and the 2001 dry season (DS) at Ndiaye (Senegal), and their reaction to four different competition levels was assessed. Competition was greatest where the test lines were grown with a mixture of an improved <i>O. sativa indica</i> cultivar and natural weed growth. Average yield losses across rice lines were 36% in the WS and 31% in the DS, but differences between lines were highly significant in both seasons and yield losses ranged from 0 to 84%. Competitive abilities were not related to yields without competition. In the DS, several of the new lines combined high yield with good competitiveness and outperformed the currently widely used check variety. Height, tiller density, specific leaf area (SLA), leaf area index (LAI), and growth duration were mostly negatively related to yield loss. Plant characteristics measured in monoculture had no explanatory value for the competitive ability of tested lines, indicating that screening under conditions of competition with weeds is preferable. Competitive abilities of several lines were stable across sites, years, and seasons; in others, they were strongly influenced by season. The simplified experimental layout can be used to screen advanced breeding lines or established cultivars with moderate resources (e.g., space, seed, labour). Including such a screening in the breeding process would enable more weed competitive cultivars to be identified and would be likely to contribute to increased resource-use efficiency, reduced yield losses, lower costs, and less reliance on herbicides in rice-based lowland systems.</p>
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