

## Response of hybrid rice (*Oryza sativa* L.) to plant spacing and weed control under transplanted condition

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### SUMMARY

A field experiment was conducted to study the effect of plant spacing and weed control on weed growth and yield of hybrid rice at C. S. Azad University of Agriculture and Technology, Kanpur during *khariif* 2002 to 2004 under transplanted condition. The spacing of 20 x 15 cm produced significantly maximum grain yield which was attributed mainly to grain weight per panicle. Weed control produced significantly higher grain and straw yields than weedy check. Closer row spacing of 20 cm reduced number and dry weight of weeds than wider rows 25 cm apart. Weeds reduced the grain yield of hybrid rice by 20.2 per cent than when controlled by two hand weedings.

**Key words :** Plant spacing, Weed control, Hand weeding, Hybrid rice, Weed species, Rice yield.

Hybrid rice is one of the available and feasible options to enhance the production and productivity of rice in the country. As a result of concerted efforts, 21 hybrids have been developed and released in the country during past one half decade. Among these 6 – 8 hybrids are under cultivation (Subbaiah, 2005). To exploit full potential of these hybrids, appropriate agro-techniques have to be developed. Keeping this in view, the present investigation was planned to study the response of hybrid rice to different plant spacings and weed control under central Uttar Pradesh condition.

### MATERIALS AND METHODS

A field experiment was carried out during rainy season (*khariif*) of 2002, 2003 and 2004 in sandy loam soil of Oilseed Research Farm, Kalyanpur of C. S. Azad University of Agriculture and Technology, Kanpur. The soil was low in organic carbon (4.1%), low in available nitrogen (198.8 kg/ha), medium in available phosphorus (15.4 kg/ha) and medium in available potassium (252.3 kg/ha) with pH 7.8. The treatments consisted of 4 plant spacings (20 x 10, 20 x 15, 25 x 10, 25 x 15 cm) and 2 weed control situation (Weedy Check and Weed control). All the eight treatment combinations were tested in randomized block design replicated four times. An uniform application of 150 kg N + 60 kg P<sub>2</sub>O<sub>5</sub> + 60 kg K<sub>2</sub>O/ha was done in all treatments. The crop was raised under assured irrigated condition. Transplanting of 25 days old seedlings was done during second fortnight of July at desired spacings keeping one seedling per hill. Hybrids used were pro-agro 6111, pro-agro 6201 and KRH-2 during 2002, 2003 and 2004, respectively. Experimental crop was harvested during second fortnight of November in each

year. To control weeds 2 hand weedings were done at 20 and 40 days after transplanting. The data on weed count and dry weight were collected at panicle initiation stage of rice and analysed after transformation (Panse and Sukhatme, 1978). Experimental crop during its life cycle received total precipitation of 712.0, 476.3 and 444.0 mm during 2002, 2003 and 2004, respectively.

### RESULTS AND DISCUSSION

#### Weeds:

In the experimental field, predominant weed species were *Echinochloa crusgalli* (L.) and *Cynodon dactylon* L. among grasses; *Cyperus rotundus* L. and *Cyperus iria* L. among sedges and, *Ammania baccifera* L. and *Ludwigia parviflora* L. among broad-leaf weeds.

The data on weeds population and dry weight (Table 2) revealed that increasing the row spacing or plant spacing increased the number and dry weight of weeds during all the three year where 25 x 15 cm spacing being at par with 25 x 10 cm, produced significantly more number of weeds than other spacings. In case of dry weight, wider spacing of 25 x 15 cm recorded significantly maximum dry weight of weeds in all individual years and also in pooling. It was followed by 25 x 10 cm spacing which recorded significantly more dry weight of weeds than both closer spacings. In pooled results, 25 x 15 cm spacing recorded 6.3, 17.5 and 21.7 per cent more number of weeds and; 22.9, 45.9 and 59.1 per cent higher dry weight of weeds than 25 x 10, 20 x 15 and 20 x 10 cm spacings, respectively. It indicates that not only number but the growth of weeds also increased under wider spacings where row distance played more role than plant distance. Kathiresan and Manoharan (2002) also reported

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