

Crop-weed competition in ricebean (*Vigna umbellata*)

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A field experiment was conducted with ricebean [*Vigna umbellata* (Thunb.) Ohwi & Ohashi] during the rainy (kharif) season of 1991 at Bhubaneswar, to study crop-weed competition.

The experiment consisting of 8 weed-control treatments (Table 1) was tested in randomized block design with 3 replications. The soil of the experimental site was well drained sandy loam with pH 5.6, organic carbon 0.2%, available phosphorus 32.7 kg/ha and available potassium 93.2 kg/ha. Ricebean was sown on 24 August with a spacing of 10 cm × 30 cm and harvested on 28 November 1991. A uniform dose of 40 kg N, 40 kg P₂O₅ and 20 kg K₂O/ha was applied at sowing. Weed index (WI) was computed by using the formula:

$$WI = \frac{a - b}{a} \times 100$$

where a and b refer to the grain yield of weed-free plot and the particular treatment respectively.

The weed flora of the experimental site included grasses, viz. *Dactyloctenium aegyptium* (L.) Willd., *Digitaria ciliaris* (Retz.) Koeler, *Sporobolus diander* Beauv., *Eleusine indica* Gaertn.; sedges, viz. *Cyperus rotundus* L.; broad-leaf weeds, viz. *Cleome icosandra* L., syn. *C. viscosa*, *Borreria articularis* (L. f.) F.N. Williams,

syn. *B. hispida* K. Schum., *Eclipta alba* (L.) Hassk., *Alternanthera sessilis* DC., *Acanthospermum hispidum* DC., *Croton bonplandianum* Baill., syn. *C. sparsiflorus* Morong, *Chenopodium album* L., *Tridax procumbens* L., *Triumfetta angulata* Lam., syn. *I. rhomboidea* Jacq., *Ludwigia perennis* L., syn. *L. parviflora* Roxb., *Melochia concatenata*, *Mimosa pudica* L. and *Hedyotis diffusa* Willd., syn. *Oldenlandia corymbosa* L.

At harvest dry-matter accumulation by weeds was markedly lowest under weed-free condition throughout and was closely followed by weedy up to 15, 30, 45 and weed-free up to 45 days after germination. Weedy throughout recorded highest (3,616 kg/ha) dry matter of weeds and was statistically alike with weed-free up to 15 days after germination.

Plots kept weedy and weed-free throughout recorded the minimum and the maximum grain yields respectively. Yield declined by 95% due to unhindered growth of weeds in the cropping season. Increase in weed-free and weedy period beyond 15 days had positive and negative influence on grain yield respectively. Plots kept weedy up to 15 days after germination, but weeded subsequently were statistically on a par with the plots maintained weed-free throughout. Weed-free up to initial 15 days, but weeding withheld in subsequent stages, remained on a

Table 1. Effect of various treatments on dry weight of weeds, yield and attributes of ricebean

Treatment	Dry weight of weeds (kg/ha)	Weed index	Pods/plant	Seeds/pod	1,000-seed weight (g)	Pod length (cm)	Yield (q/ha)
Weedy up to 15 DAG	63	7	18.1	5.7	71.1	8.2	5.12
Weedy up to 30 DAG	77	39	15.2	5.3	70.2	8.5	3.36
Weedy up to 45 DAG	105	65	13.7	3.9	66.1	7.7	1.96
Weedy throughout	3,616	95	3.0	3.3	65.6	7.1	0.27
Weed-free up to 15 DAG	3,223	69	12.5	3.8	64.4	7.2	1.71
Weed-free up to 30 DAG	1,448	35	14.1	3.6	70.0	7.6	3.57
Weed-free up to 45 DAG	225	1	17.9	4.5	70.7	8.4	5.48
Weed-free throughout	45	-	22.1	6.3	72.3	8.7	5.53
CD (P = 0.05)	358		7.6	1.8	NS	1.0	0.58

DAG, Days after germination

par with weedy plot. Thus weedy or weed-free up to 15 days after germination does not influence grain yield of ricebean. This corroborates the findings of Raghvani *et al.* (1984) in rainfed groundnut and Gogoi *et al.* (1991) in rainfed field pea. Weedy up to 15 days after germination, weed-free up to 45 days after germination and season-long weed-free were at par. Weed flushed beyond 45 days after germination are not capable of causing significant yield reduction. The well-developed crop canopy exerts smothering effect on weeds. This was supported by the findings of Prusty *et al.*

(1990) in upland rice. More or less same trend was also observed in case of yield attributes of ricebean.

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