

## Effect of Different Herbicides on Weed Management in Radish

Moolchand Singh, S. Prabhukumar, C. V. Sairam and Arun Kumar<sup>1</sup>

ICAR Transfer of Technology Project, Zonal Coordinating Unit, Zone VIII  
MRS, HA Farm Post, Hebbal, Bangalore-560 024 (Karnataka), India

Radish (*Raphanus sativus* L.) is a popular vegetable root crop in both tropical and temperate regions. Radish is grown for its young tender tuberous roots, which are eaten raw as salad or cooked as vegetable. It is a good source of vitamin C and minerals like calcium, potassium and phosphorus. In northern plains, it is grown during winter, while in the peninsular India radish can be grown almost throughout the year. Weeds pose a serious problem in vegetable crops because of the liberal use farm yard manure, fertilizers and frequent irrigations that help the weeds to grow vigorously. It has now been well established that losses from weeds are more than due to insect-pests and diseases. In most of the vegetables, early growth period is the most critical stage at which stress of any kind can affect the economic yield. Weed competition is one such stress during this period. During this period weather conditions do not permit the traditional methods of weed control. Besides, this period coincides with a period of scarcity of labour for weeding. Chemical weed control method, therefore, is the prime need. Very little information with regard to chemical weed control on root crops in general and radish crop in particular is available especially in India. Use of pre-emergent herbicides is beneficial to keep the crop weed free in the early stages. On-farm trials with different pre-emergent herbicides in radish were conducted to analyze how the weed competition influenced growth and thereby root yield.

On-farm trials were conducted in adopted villages at five locations on farmers' fields in Bangalore rural district of Karnataka during **kharif** seasons of 2006 and 2007 under irrigated conditions. The soil of trial fields varied from red sandy loam to red sandy clay loam with pH ranging from 6.12 to 7.2. The soil was low in organic carbon, medium in available phosphorus and medium to high in available potassium. The trials comprised seven treatments viz., alachlor (1.5 kg/ha), butachlor (1.5 kg/ha), pendimethalin (1.0 kg/ha), fluchloralin (1.6 kg/ha), oxyfluorfen (0.25 kg/ha), weed

free check and unweeded control during both the years (Table 1). The treatments were laid out in plot size of 3.0 × 1.8 m in randomized block design and were replicated thrice. The seeds were sown at a spacing of 30 × 10 cm. All the pre-emergent herbicides were sprayed immediately after sowing, while fluchloralin was applied one week before sowing and incorporated in the soil. Crop was raised according to package of practices of University of Agricultural Sciences, Bangalore. The observations on weed dry weight were recorded at harvest. The weed control efficiency was calculated by the formula given by Patel *et al.* (1987). Roots were harvested from net plot area at 90 days after sowing and yield was expressed in terms of quintals per hectare basis.

The efficiency of different herbicides used in the trials for controlling weeds in radish crop was found similar during both the years. Hence, mean of the two years was taken. All the herbicides significantly reduced the weed biomass. Among the herbicide treatments butachlor @ 1.5 kg/ha recorded lowest weed dry weight (4.84 g/0.25 m<sup>2</sup>) followed by alachlor @ 1.5 kg/ha (6.03 g/0.25 m<sup>2</sup>). The highest weed dry weight was recorded in unweeded control (13.90 g/0.25 m<sup>2</sup>). Similar results were also reported by Leela (1987) in radish and knoll khol. Mean of two years' data indicated that among the herbicides studied higher weed control efficiency was observed with butachlor @ 1.5 kg/ha (65.4%) as compared to other herbicides such as alachlor @ 1.5 kg/ha (63.9%), pendimethalin 1.0 kg/ha (49.8%), fluchloralin 1.6 kg/ha (48.8%) and oxyfluorfen 0.25 kg/ha (48.0%). Pre-emergence application of alachlor and butachlor resulted in better control of weeds and provided weed free conditions for longer period of crop growth and resulted in increased plant height. In unweeded control, the crop was adversely affected by weeds due to heavy competition with crop for nutrients, moisture, space and light which can be attributed for suppressed crop growth. Root yield was significantly high in weed free check (678.6 q/ha) and was superior

<sup>1</sup>CSA University of Agriculture & Technology, Kanpur (U. P.), India.

Table 1. Effect of different herbicides on weed control efficiency and yield of radish

S. No.	Treatments	Dose (kg a. i./ha)	Weed control efficiency (%) at harvest	Root yield (q/ha)
1.	Alachlor	1.50	63.90	619.30
2.	Butachlor	1.50	65.40	648.80
3.	Pendimethalin	1.00	49.40	551.70
4.	Fluchloralin	1.60	48.80	540.40
5.	Oxyfluorfen	0.25	48.00	450.60
6.	Weed free check	-	83.30	685.00
7.	Unweeded check	-	0.00	304.20
LSD (P=0.05)			8.15	64.20

over all treatments. Among the herbicides, pre-emergence application of butachlor @ 1.5 kg/ha and alachlor @ 1.5 kg/ha recorded significantly higher root yield (648.8 and 619.3 q/ha, respectively). Higher yield in these herbicide treatments is due to their higher weed control efficiency. It is concluded that pre-emergence application of butachlor at the rate of 1.5 kg/ha may provided better and cost effective weed management in radish under Karnataka conditions.

### REFERENCES

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