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Influence of integrated weed management on horticultural characteristics and yield on onion

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ABSTRACT

The field experiments were conducted at the Main Garden of University, Department of Horticulture, Dr. PDKV, Akola to study the influence of integrated weed management on horticultural characteristics and yield of onion bulbs. The results indicated that, the herbicides along with hand weeding had no effect on height, neck thickness and total soluble solids of onion bulbs. An integrated treatment of pre-emergence application of fluchloralin @ 1.0 kg ha^{-1} followed by two hand weedings at 30 and 60 DAT produced the maximum diameter and the highest yield of onion bulbs (72.4 t ha^{-1}).

Key words : Onion, Herbicides, Weed, Yeild.

Onion is an important commercial crop in Indian horticulture and grown on a large area throughout the country. Being an irrigated crop, it is severely infested by weeds which interfere with development of the onion bulbs thereby reducing the bulb yield to the extent of 40 – 80% (Verma and Singh, 1996). Herbicides are important tool for weed control but it is not effective in controlling all the weeds present in the crop. An integrated weed management system consist of combinations of two or more methods of weed control at low input level in order to reduce crop-weed competition in a given cropping system below an economic threshold level. Therefore, the present investigation was proposed to study the influence of weed management practices on horticultural characteristics and yield of onion bulbs.

MATERIALS AND METHODS

The experiments was conducted during *rabi* season of the years 2003 and 2004 at Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. The soil of the experimental field was medium black. The experiment was laid out in randomized block design with three replications and seventeen treatments comprised of five herbicides *viz.*, fluchloralin, pendimethalin, alachlor, trifluralin and oxyfluorfen. For each herbicide two concentrations were used and out of these two concentrations the higher concentration of herbicide was tested alone and lower concentration was supplemented with one hand weeding at 45 DAT and two hand weedings at 30 and 60 DAT. One cultural treatment of three hand weedings at 20, 40 and 60 DAT and one treatment of unweeded control were also included in the study. All the herbicides were applied before transplanting of onion seedlings as a pre-emergence treatment. Sixty days old seedlings of onion variety Akola Safed were transplanted on 9th January 2003 and 2004 at a spacing of 10 x 10 cm in flat beds. The observations were recorded on diameter and height of onion bulb, neck thickness of bulb, total soluble solids (TSS) of onion bulb, weight of onion bulb, weight of '100' bulbs and per hectare yield of onion bulbs.

RESULTS AND DISCUSSION

The data regarding horticultural characteristics and yield of onion bulbs as influenced by different herbicidal treatments are present in Table 1. During the years 2003 and 2004, an integrated treatment of pre-emergence application of fluchloralin @ 1.0 kg ha^{-1} followed by two hand weedings at 30 and 60 DAT produced the maximum diameter of onion bulb (6.34 and 6.18 cm, respectively). However, minimum diameter of onion bulb was noted under an unweeded control treatment (4.25 and 4.41 cm, respectively). An increase in diameter of onion bulb under the application of fluchloralin alongwith hand weedings was earlier reported by Warade *et al*. (1995) and Singh (1996). However, the herbicides along with hand weedings had no effect on the height of onion bulb. Similar result was reported by Warade *et al*. (1995). Similarly, non-significant differences were observed for the neck thickness of onion bulb due to various herbicidal treatments during both the years of experimentation. During 2003 and 2004, the different herbicidal treatments did not showed any significant effect on the total soluble solids