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CONTENTS

Effect of integrated weed management practices on growth parameters in vegetable pea (*Pisum sativum* L.)

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ABSTRACT: The present investigation was performed to study the effect of integrated weed management practices on growth parameters in vegetable pea (*Pisum sativum* L.) at Vegetable Research Centre, Govind Ballabh Pant university of Agriculture and Technology during *rabi* season of 2022-23. The experiment was set out in randomized block design along with three replications. During this research, the major weed species that were observed in the experimental plot were *viz*., *Eleusine indica* L., *Cynodon dactylon* L. *Sorghum halepense* L. *Chenopodium album* L. and *Cyperus rotundus* L.The experiment comprised of data on growth parameters were collected and analysed using analysis of variance (ANOVA). The results revealed that the performance of the growth parameters *i.e.,* days to 50 % germination and days to 50 % flowering of vegetable pea was significantly influenced by different weed management treatments. Among herbicidal treatments, T_5 (Pre emergence application of pinoxaden 5.1 EC @ 70 ml/ha was found to be the best with respect days to 50 % germination and T_4 (Pre emergence application of pendimethalin 30 EC @ 1.0 kg a.i./ha with respect to days to 50 % flowering.

Key words: Growth, herbicide, vegetable pea, weed

Pea (*Pisum sativum* L.) is an annual self-pollinated diploid (2n=2x=14), temperate legume, belongs to family fabaceae. In India, pea is grown over an area of 567 thousand hectare with the annual production of 5846 thousand metric tons. While in the region of Uttarakhand, it is grown over an area of 13.62 thousand hectare with an annual production of 102.98 thousand metric tons. Globally, in agricultural crops weeds caused the highest potential loss (34 %). In India, weeds generally reduce crop yield by 36.5 % in rainy season and 22.7 % during winter season. It was proved that weeds are economically more important than insect-pests, fungi or other pest organisms (Savary *et al*., 1997). In pea, weeds cause 37.3 to 64.4 % reduction in yield (Harker, 2001). Yield of any crop decline in the absence of weed control and this reduction depends on the weed species and the quantum of weed flora. Several types of weeds are associated with peas. In general, the yield loss due to weeds is almost always caused by a group of different weed species, and these species can differ considerably in competitive ability (Weaver and Ivany, 1998). The most important weeds of pea crop are *Anagallis arvensis, Chenopodium album, Convolvulus arvensis, Cyperus rotundus, Circium arvense, Cynodon dactylon, Melilotus alba, etc*. Herbicides contribute effectively and profitably to weed control, environmental protection, and at the same time, saving labour necessary for weed control practices, reducing soil erosion, saving energy, increasing production and reducing thecost of farming. Therefore, herbicides benefit society as a whole. The importance of herbicides in modern weed management is underscored by the estimates that losses in the agricultural sector would increaseto about 500 % without the use of herbicides (Bridges, 1992). The main objective is to study the influence of integrated weed management practices on growth parameters of vegetable pea.

MATERIALS AND METHODS

The field experiment was conducted to assess the effect of integrated weed management practices on growth parameters of vegetable pea (*Pisum sativum* L.) at Vegetable Research Centre, G. B. Pant University of Agriculture and Technology, Pantnagar

during *rabi* season of 2022-23. Pantnagar lies in the humid sub-tropical zone and situated in the Tarai region at the foothills of Shivalik range of Himalayas. It is located at an altitude of 243.84 meters above mean sea level and geographically, it falls in 29° N latitude and 79.30° E longitude. The experiment was designed in randomized block design with three replications. The experiment comprised of nine treatments and 3 replications *viz*. T_1 (Pre emergence application of metribuzin 70 WP @ 0.75 kg a.i./ha), T_2 (Pre emergence application of metribuzin 70 WP @ 1.0 kg a.i./ha), T_3 (Pre emergence application of pendimethalin 30 EC @ 0.75 kg a.i./ha + 1 hand weeding at 40 DAS), T_4 (Pre emergence application of pendimethalin 30 EC @ 1.0 kg a.i./ha), T_5 (Pre emergence application of pinoxaden 5.1 EC @ 70 ml/ha), T_6 (Pre emergence application of pinoxaden 5.1 EC @ 100 ml/ha), T_7 (Weed Free), T_8 (Hand Weeding at 20 and 40 DAS) and T_9 (Weedy check). All the herbicidal treatments were at pre-emergence. The observations were made on growth parameters and these observations were taken from five randomly selected plants of each treatment and in each replication.

RESULTS AND DISCUSSION

Days to 50 % germination

The result presented in Table 1 showed that, the minimum days to 50 % germination was recorded in T_5 (Pre emergence application of pinoxaden 5.1 EC @ 70 ml/ha) which was statistically at par with T_4 (Pre emergence application of pendimethalin 30 EC @ 1.0 kg a.i./ha), T_3(Pre emergence application of pendimethalin 30 EC @ 0.75 kg a.i. /ha + 1 hand weeding at 40 DAS), and T_6 (Pre emergence application of pinoxaden 5.1 EC @ 100 ml/ha) and the maximum days was recorded in T_9 (Weedy check). It is observed from the data that the minimum days to 50 % germination was recorded under the T_5 (Pre emergence application of pinoxaden 5.1 EC @ 70 ml/ha) as pinoxaden is known for its effectiveness in controlling grassy weeds. By reducing the competition from grassy weeds in the experimental plot, pea seeds might have encountered fewer obstacles in terms of nutrient availability, water uptake, light interception as well as space. This provides the congenial atmosphere for faster and uniform germination of pea seeds.The results are also in agreement with findings of Nirala *et al*. (2020) and Chauhan *et al*. (2019).

Days to 50 % flowering

The result presented in Table 1 showed that the minimum days to 50 % flowering was recorded in T_7 (Weed free) which was statistically at par with T_4 (Pre emergence application of pendimethalin 30 EC @ 1.0 kg a.i./ha), respectively. Whereas, maximum days to 50 % flowering was recorded in T_9 (Weedy check). It is observed from the data that the minimum days to 50 % flowering were found under the T_7 (Weed free). It might be due to hand weeding at weekly intervals to create weed free condition during entire growth period which provides a suitable atmosphere to plants for their proper growth and development.The results are also in agreement with

Table 1: Effect of integrated weed management practices on days to 50% germination and days to 50% flowering in vegetable pea (*Pisum sativum* L.)

Treatments	Days to 50% germination	Days to 50% flowering
Metribuzin 70 WP @ 0.75 kg a.i./ha	14.33	47.67
Metribuzin 70 WP @ 1.0 kg a.i./ha	13.67	46.33
Pendimethalin 30 EC @ 0.75 kg a.i./ha + 1 hand weeding at 40 DAS)	12.33	39.67
Pendimethalin 30 EC @ 1.0 kg a.i./ha	11.67	37.67
Pinoxaden 5.1 EC @ 70 ml/ha	11.33	45.67
Pinoxaden 5.1 EC @ 100 ml/ha	12.67	42.33
Weed Free	13.67	37.00
Hand Weeding at 20 and 40 DAS	14.67	48.00
Weedy Check	16.33	50.33
C.D. (0.05)	1.42	2.53
SEm±	0.47	0.83

findings of Dubey *et al*. (2018) and Yousuf *et al*. (2023).

CONCLUSION

On the basis of this investigation, it was concluded that among all the treatments, the minimum days to 50 % germination was recorded under the T_5 (Pre emergence application of pinoxaden 5.1 EC @ 70 ml/ha and the minimum days to 50 % flowering were found under T_7 (Weed free) which was statistically at par with T_4 (Pre emergence application of pendimethalin 30 EC @ 1.0 kg a.i./ha). Therefore, these treatments were found suitable for cultivation of vegetable pea under tarai conditions.

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