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Influence of phosphorus application on growth and yield of Ashwangandha (*Withania somnifera*)

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SUMMARY

The investigation on influence of phosphorus on yielding ability in Ashwaganadha (*Withania somnifera*) genotypes was carried out during the *Rabi* season of 2002-2003 with an object to study the effect of phosphorus applications on growth and yield of Ashwagandha genotypes. The three levels of phosphorus were used for study. Application of P_2 phosphorus level (*i.e.* 40 kg of P_2O_5 per hectare) gave highest seed and root yield. Similarly, in phosphorus level 40 kg P_2O_5 per hectare (P_2) produced highest dry matter in Ashwagandha genotypes.

Key words : Growth, Yield, Ashwagandha, Genotypes, Phosphorus

India is knwon as rich source of medicinal plants since ancient time. Ashwagandha (*Withania somnifera*) is one of the most important medicinal plant from India. Due to harmful side effects associated with the use of synthetic drugs at several times there is good scope for medicinal plants in Ayurvedic medicines. However, in Ashwagandha, the information regarding cultivation practices is available, but the knowledge regarding the effect of phosphorus levels on maximum yield attributes is limited. Therefore, the study was undertaken to determine the best level of phosphorus application for Ashwagandha genotypes in Marathwada region of Maharashtra state at Parbhani.

MATERIALS AND METHODS

A field experiment was conducted during *Rabi* season in 2002-2003, at Medicinal and Aromatic Plants Garden, Department of Agricultural Botany, College of Agriculture, Marathwada Agricultural University, Parbhani. The soil of the experimental field was medium black with moderate moisture retention capacity. The topography of the field was fairly leveled. The experiment was conducted in a Factorial Randomised Block Design (FRBD) with three replications and three treatments. The three treatments comprised of three different levels of phosphorus application *viz.*, P_0 (0.00 P_2O_5 kg/ha), P_1 (20.00 P_2O_5 kg/ha) and P_2 (40.00 P_2O_5 kg/ha). The land was ploughed about 20 cm deep after harvest of previous crop. Fine tilth were achieved by subsequent harrowing with blade harrow and the experimental area was cleaned and the field was kept ready for transplanting. Data on respective parameters were collected from randomly selected and tagged five plants per plot.

RESULTS AND DISCUSSION

Observations regarding growth parameters and root and seed yield are presented in Table 1 and 2. The effect of phosphorus levels on height and number of leaves were significant at all the stages of crop growth. However, 20.00 kg and 40.00 kg P_2O_5 application were significantly increased the plant height and number of leaves over no phosphorus application. In respect of number of branches, it was observed that at 90 days onwards 40.00 kg P_2O_5 / ha produced significantly higher number of branches than 0.00 kg and 20.00 kg P_2O_5 /ha. Significantly early 50 per cent flowering was noticed in application of 40.00 kg P_2O_5 /ha over 0.00 kg and 20.00 kg P_2O_5 /ha at all stages of observations.

It was observed that, root and seed yield per plant and per hectare significantly affected by different levels of phosphorus. The maximum root yield and seed yield per plant and per hectare was observed with application of 40.00 kg P_2O_5 /ha as compared 0.00 kg and 20.00 kg P_2O_5/ha. Similar results were reported by Kaushal *et al.* (2002) and Pawar (2000).

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