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Uptake of nutrients, root yield and quality of ashwagandha (*Withania somnifera* Dunal) as influenced by harvesting period

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SUMMARY

A field experiment to study the uptake of nutrients, root yield and quality of ashwagandha *(Withania somnifera* Dunal*)* as influenced by harvesting period was conducted at Nagarjun Medicinal Plants Garden, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola (Maharashtra) during 2003-04. The soil of the experimental site was slightly calcareous, alkaline and clayey in texture, sufficient in available K, however, low in organic carbon, available N and Olsen's P. The treatments were comprised of five harvesting time *viz.*, T_1- At flowering initiation, T_2- 50% flowering, T_3-100 % flowering, T_4-Berry ripening and T_5-At maturity tried in Randomized Block Design with four replications. The content of N, P, K and S in dry matter was decreased with the harvesting time in dry matter as well as in roots. The uptake of N was significantly increased up to 50% flowering stage. P and S were significantly increased up to berry ripening stage and K uptake was noticed highest at maturity stage. The content of micronutrients (Zn, Fe, Mn, Cu and B) was also decreased with the harvesting time in dry matter as well as roots. The uptake of micronutrients increased with the harvesting time. Zn was noticed maximum at 100% flowering stage and Fe was noticed maximum at berry ripening stage. Significantly highest root yield was recorded with the harvesting at 100% flowering stage over all the treatments except berry ripening stage. The crude content was found to increase with the harvesting time. The highest fibre content was recorded at maturity stage. The total alkaloids content was significantly highest at 50% flowering stage followed by 100% flowering stage. Significantly lowest content was noticed at flower initiation stage. However, the yield of total alkaloids was significantly highest with 100% flowering stage over all the treatments. The total uptake of P, Fe, Cu were contributed for synthesis of total alkaloids in the Ashwagandha roots which ultimately results in to positive significant correlation.

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Key words : *Withania somnifera*, Nutrient uptake, Total alkaloids

Ashwagandha or Asgandh (*Withania somnifera* Dunal) is the member of nightshade family *i.e.* Solanaceae. It is an errect, herbaceous, evergreen, tomentose shrub with 13 to 50 cm height. The crop is being commercially cultivated on an area of around 10,000 ha in India mostly in Madhya Pradesh. Traditionally as a medicine Ashwagandha has been used in many ways, as a sedative, diuretic, a rejuvenating tonic. Ashwagandha roots are also used for a wide range of ailments including arthritic inflammation, insomnia, cough, nervous disorders, gynecological disorders, especially functional female and male fertility and impotence. The pharmacological activity of the roots is attributed to the alkaloids present in it.

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Ashwagandha has assumed great importance now a days due to its good domestic market value and potential. The research work on the stages of harvesting and its effect of root quality is very meagre. Due to its constant demand, good market price and important medicinal value, area under ashwagandha is increasing day by day. The local farmers have queries about its package of practices particularly stage of harvesting and nutritional management and, therefore, the present investigation was carried out.

MATERIALS AND METHODS

A field experiment was conducted under All India Networking Project on Medicinal and Aromatic Plants(ICAR), Nagarjun Medicinal Plants Garden, Dr. Panjabrao Deshmukh Krishi Vidyapeeth Akola during *Kharif* 2004-2005.

The soil of the experimental site was clayey, calcareous, alkaline in reaction, and sufficient in available K, however, low in organic carbon, available N and Olsen's P. The treatments were comprised of five harvesting time