Internat. J. agric. Sci. Vol.2 No.2 July 2006 : (566-569)

Site specific nutrient management in European dill (*Anethum graveolens* L.) at subtropical belt of Uttaranchal

Sunita T. Pandey*, Pankaj Singh and Pooja Pande
Department of Agronomy, College of Agriculture, G.B. Pant University of Ag. and Tech., PANTNAGAR (U.A.) INDIA

ABSTRACT
The experiment on site specific nutrient management in European dill having 15 treatments was conducted at sub-tropical belt of Uttaranchal. It revealed that treatment T_3 having phosphorus @ 25 Kg ha^{-1} with other nutrients & micronutrients led to higher yield attributes and yield. The treatment T_5, T_6 & T_7 having decreasing levels of potassium caused a decrease in yield attributes & yield. Treatment T_{13} (vermicompost + recommended dose) had better yield attributes & yield compared to T_{12} & T_{14} having recommended dose and vermicompost alone respectively.

Key words : SSNM, European dill

INTRODUCTION
Existing fertilizer recommendations often consist of fixed rates and timings of fertilizer application for vast areas. Such recommendations assume the crops need for nutrients as constant among years and over large areas. But crop growth and crop need for supplemental nutrients can be strongly influenced by crop growing conditions, crop & soil management and climate which can vary greatly among fields, villages, seasons and years. Therefore, Site Specific Nutrient Management in European dill at sub-tropical belt of Uttaranchal would strive to enable the farmers to dynamically adjust fertilizer use to optimally fill the deficit between the nutrient needs of crop and the nutrient supply of naturally occurring indigenous sources.

European dill (*Anethum graveolens* L) commonly known as vilayati saunf in India is an annual, glabrous and aromatic herb belonging to the family umbelliferae. It is well known for its medicinal properties due to the presence of essential oil (2.5-3.0%) in the seed and 0.55 to 0.60% in whole plant. The essential oil and its constituents are used in pharmaceutical industries as they are considered to be stomachic, diuretic and anthelminthic. The emulsion of dill oil in water is considered to be carminative, anti-flatulent, anti-colic pain, anti-vomiting and anti-hiccups for infants and children (Randhawa and Singh, 1988). Dill oil is an important ingredient of gripe water preparation.

Since information on SSNM in medicinal and aromatic plants is very few, therefore, the present study gains more importance and was undertaken with the objective to record the response of site specific nutrient management on dry weight, number of branches / plant, yield attributes, yield and oil content of European dill an aromatic plant under subtropical conditions.

MATERIALS AND METHODS
The experiment on site specific nutrient management in European dill was carried out at Medicinal Plant Research and Development centre (M R D C) Haldi, Pantnagar during rabi season of 2003-04 and 2004-05.

The experimental site is situated in the Tarai region of Uttaranchal at 29^0 N latitude, 79^0 30'E longitude and of at altitude of 243.83m above mean sea level. The soil is classified as mollisol. The soil of the experimental field represents Haldi loam series which is the 23rd benchmark soil of India.

The field experiment conducted at MRDC had fifteen treatments replicated thrice in a randomized block design (RBD). The treatments were $N_{120}P_{75}K_{120}S_{30}B_5Fe_{40}Zn_{20}$ (**T_1**); $N_{120}P_{50}K_{120}S_{30}B_5Fe_{40}Zn_{20}$ **(T_2)**; $N_{120}P_{25}K_{120}S_{30}B_5Fe_{40}Zn_{20}$ **(T_3)**; $N_{120}P_0K_{120}S_{30}B_5Fe_{40}Zn_{20}$ **(T_4)**; $N_{120}P_{75}K_{80}S_{30}B_5Fe_{40}Zn_{20}$ **(T_5)**; $N_{120}P_{75}K_{40}S_{30}B_5Fe_{40}Zn_{20}$ (**T_6**); $N_{120}P_{75}K_0S_{30}B_5Fe_{40}Zn_{20}$ (**T_7**); $N_{120}P_{75}K_{120}S_{30}B_5Fe_{40}Zn_0$ (**T_8**); $N_{120}P_{75}K_{120}S_{30}B_5Fe_0Zn_{20}$ (**T_9**); $N_{120}P_{75}K_{120}S_{30}B_0Fe_{40}Zn_{20}$ (**T_{10}**); $N_{120}P_{75}K_{120}S_0B_5Fe_{40}Zn_{20}$ (**T_{11}**); GENERAL RECOMMENDATION ($N_{90}P_{50}K_{80}$) (**T_{12}**); VERMICOMPOST @ 5 t/ ha + RECOMMENDED DOSE (**T_{13}**); VERMICOMPOST @ 5 t/ ha (**T_{14}**) and CONTROL (No Fertilizer) (**T_{15}**).

Vermicompost @ 5 ton/ha was incorporated into the plots receiving vermicompost treatments. The sources of nutrients used were Urea, Diammonium phosphate and Muriate of potash for N, P and K respectively, whereas micronutrients Sulphur (S), Boron (B), Iron (Fe) and Zinc (Zn) were applied through Sulphur Powder, Boric Acid Powder (H_3BO_3), Iron Sulphate ($FeSO_4$) and Zinc chloride ($ZnCl_2$) respectively. The European dill crop was raised by direct seeding in 3-4 cm deep furrows at 45cm spacing and maintaining plant to plant distance of 20cm. The yield and yield attributes were calculated from harvest of net plot (4m x 3m) i.e., $12m^2$ area.

The observations taken were as follows: Dry weight of plants (g per m row length) at 90 DAS, 120 DAS & harvest stage; number of branches per plant at harvest; number of umbels per plant at harvest; seed weight per umbel at harvest; seed & straw yield (Kg/ha); Oil content (%) & oil yield (Kg/ha).

RESULTS AND DISCUSSION
Dry weight
Effect of different treatments on dry weight (g per metre row length) of European dill plants varied significantly at all the growth stages of crop during 2003-04 and 2004-05 (Table-1). At 90 DAS treatments T_4, T_5 & T_{13} had significantly higher dry weight and was at par with T_6 & T_9 during 2003-04 while during 2004-05 treatments T_7 & T_{12} caused significantly higher dry weight compared to other treatments and being at par with treatment T_3.

At 120 DAS, treatments T_5, T_9, T_{11} & T_{13} being at par with treatment T_6 were found to have significantly higher dry weight compared to remaining treatments during 2003-04 while during 2004-05 treatments T_2, T_7, T_9, T_{10} & T_{12} had significantly higher dry weight compared to remaining treatments and were at par with treatment T_{13}.

At harvest stage during 2003-04 treatment T_{13} recorded significantly higher dry weight while treatments T_6 and T_{12} were at par with it. During 2004-05, treatment T_3 recorded highest dry weight which was significantly higher over remaining treatments. However, treatment T_7 also had higher dry weight and treatments T_1, T_2, T_6, T_8 and T_9 were at par with it and being significantly higher over remaining treatments. These results are contrary to the results obtained by Halva and Puukka (1987) that at higher doses of N, P & K dry weight of dill increased.

The decreasing levels of phosphorus, potassium & micronutrients viz., Zinc, Iron, Boron & Sulphur did not affect the dry weight at any of the growth stages during both the years. Further, the

*Author for correspondence