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Effect of Integrated Nutrition Management on Growth and Yield of Coriander (*Coriandrum sativum* L.)

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ABSTRACT

A field experiment was conducted during *Rabi* season of 2000-01 at Regional Agricultural Research Station, Lam to study the effect of Integrated Nutrient Management on growth and yield of Coriander (*Coriandrum sativum* L.) . Results of the study revealed that combined application of inorganic, organic and biological sources of nutrients (T_1 – 100% RDN + FYM @ 5 t/ha + *Azospirillum*, T_2 – 75% RDN + FYM @ 5 t/ha + *Azospirillum*, T_3 – 50% RDN + FYM @ 5 t/ha + *Azospirillum*) recorded significantly superior growth and yield over control, T_8 (100% RDN).

Key words : Coriander , Integrated Nutrient Management.

Coriander (*Coriandrum sativum* L.) is an indispensable spice in the kitchen to prepare tasty dishes. Besides the grain used as spice, the leaves have an excellent usage in flavouring of and garnishing the dishes. Coriander apart from grain is also exported as curry powder and spice mix to the Far East and Gulf Countries. Nitrogen is a major nutrient affecting the yield and quality of the crop. Application of nitrogen through chemical fertilizers is a common practice, which is ecologically unsustainable. In recent years bio-inoculants have emerged as a promising component of nutrient supply system. These are not only low cost inputs, but also give high returns under favourable conditions (Virender Sardana, 1997). The beneficial use of nitrogen fixing microorganisms *viz*., *Azospirillum* and *Azotobacter*, as a supplementary source of plant nutrition on agricultural crops is well documented by Subba Rao (1982) Oken and Gonzalez (1994) and Barakart and Gabr (1998). In order to maintain the Indian monopoly in the international spice trade and face the competition from newly emerging spice-exporting countries, there is a need to improve the quality of spices as required by the user countries. In this context an experiment was planned to study the effect of organic manures and bio-fertilizer at reduced levels of inorganic fertilizers on growth and yield attributes in coriander.

MATERIAL AND METHODS

The experiment was conducted at Regional Agricultural Research Station, Lam, Guntur on vertisols during 2000-2001 *Rabi* season under residual soil moisture. The experimental soil was low in available N (182 kg ha^{-1}), medium in available P_2O_5 (31 kg ha^{-1}) and high in exchangeable K_2O (467 kg ha^{-1}). An uniform recommended dose of phosphorus and potash @ 40 and 20 kg ha^{-1} was given in the form of single super phosphate and murate of potash to all the treatments as basal application. The recommended dose of nitrogen @ 30 kg ha^{-1} was given as urea as per the treatment. *Azospririllum* was given as seed inoculation.

The treatments consisted of 100% recommended dose of nitrogen (RDN) + FYM @ 5 t/ha + *Azospirillum* (T_1), 75% RDN + FYM @ 5 t/ha + *Azospirillum* (T_2), 50% RDN + FYM @ 5 t/ha + *Azospirillum* (T_3), FYM @ 5 t/ha + *Azospirillum* (T_4), FYM @ 5 t/ha (T_5), FYM @ 10 t/ha + *Azospirillum* (T_6), FYM @ 10 t/ha (T_7) and 100% RDN (Control, T_8). Coriander variety, Sadhana was drilled in rows spaced at 30 cm by using 15 kg seed ha^{-1} and plants in the rows were thinned to maintain a spacing 10 cm from plant to plant within the row. The observations in respect of plant height, number of primary branches, number of secondary branches, number of umbels ,number of umbelets per umbel and grain yield were recorded.

RESULTS AND DISCUSSION

The effect of different combinations of inorganic , organic (FYM) and biological (*Azospirillum*) sources of nutrients on growth and grain yield of coriander are presented in Table 1. A perusal of the data in the table showed a significant influence of inorganic, organic (FYM) and biological (*Azospirillum*) sources of nutrient combinations on plant height. Among the different combinations of

Table 1. Effect of Integrated Nutrient Management of growth and yield of Coriander

Treatment	Plant height (cm)	No.of primary branches/ plant	No.of secondary braches/ plant	No.of umbels/ plant	No.of umbelets/ umbel	Grain yield (kg ha^{-1})	Percentage increase/ decrease over control
T_1	62.8	8.2	11.0	17.3	6.2	783	20.5
T_2	62.1	8.0	10.8	16.8	6.1	767	18.0
T_3	61.2	7.9	10.8	16.1	6.1	758	16.6
T_4	53.1	6.6	7.9	11.3	5.7	675	3.9
T_5	47.2	6.1	7.0	8.2	5.3	600	(-)7.7
T_6	55.7	6.8	8.6	13.4	5.9	709	9.1
T_7	52.1	6.5	7.6	9.7	5.6	642	(-)1.2
T_8	52.9	6.6	7.8	10.6	5.6	650	-
CD (P=0.05)	6.12	1.21	2.20	3.60	0.46	80.40	-

T_1 = 100% RDN + FYM @ 5 t ha^{-1} + *Azospirillum*
T_2 = 75% RDN + FYM @ 5 t ha^{-1} + *Azospirillum*
T_3 = 50% RDN + FYM @ 5 t ha^{-1} + *Azospirillum*
T_4= FYM @ 5 t ha^{-1} + *Azospirillum*
T_5 = FYM @ 5 t ha^{-1}
T_6= FYM @ 10 t ha^{-1} + *Azospirillum*
T_7= FYM @10 t ha^{-1}
T_8 = Control (100% RDN)

nutrient sources T_1 (100 %RDN + FYM @ 5 t/ha + Azospirillum) recorded the greatest plant height of 62.8 cm which was closely followed by T_2 (75% RDN + FYM @ 5 t/ha + *Azospirillum*) and T_3 (50% RDN + FYM @ 5 t/ha + *Azospirillum*) with 62.1 and 61.2 cm respectively which in turn were significantly superior over control, T_8 (100% RDN) with 52.9 cm. The other treatments on par with control(T_8), with regards to plant height were T_6 (FYM @ 10 t/ha + *Azospirillum*), T_4 (FYM @ 5 t/ha + *Azospirillum*) and T_7 (FYM @ 10 t/ha). The lowest plant height was recorded in T_5 (FYM @ 5 t/ha), which was not significantly varying from T_8.Greater plant height in Okra with the combination of 100% NPK, FYM and *Azospirillum* was reported by Ray *et al*., (2005) and support the present result.

Number of primary branches per plant were also significantly influenced with the combination of different sources of nutrients. The primary branches per plant were highest in T_1 which was on par with T_2 and T_3 and were significantly superior over control,T_8. In case of number of secondary branches per plant, the same trend as in the case of primary branches per plant was observed. The increase in the activity of plant growth substances likes Gibberllic acid, Indole Acetic Acid and Dehydrogeatin in *Azospirillum* inoculated plants as noticed by Gunasekharan and Vissak (1986) might be responsible for the increased vegetative growth of coriander inoculated with *Azospirillum.*

The treatments with combination of inorganic, organic (FYM) and biological (*Azospirillum*) sources of nutrients had exerted significant influence on the yield attributes of coriander such as number of umbels per plant and number of umbelets per umbel. The number of umbels per plant were highest in T_1 which did not significantly differ with T_2 and T_3. The lowest numbers of umbels per plant were recorded in T_5, which was on par with T_4, T_7 and T_8. Higher number of umbelets per umbel were recorded in T_1 closely followed by T_2 and T_3 and significantly superior over control, T_8. As far as the umbelets per umbel was concerned, the lowest was recorded in T_5, which was on par with T_6 and T_8.

Among the different combinations of nutrient sources T_1 followed by T_2 and T_3 produced significantly superior grain yields of 783, 767 and 758 kg/ha respectively over control, T_8 (650 kg ha^{-1}). The yield increments found in T_1, T_2 and T_3 over T_8 (Control) were 20.5, 18.0 and 16.6% respectively. The treatments with inorganic, organic (FYM) and biological (*Azospirillum*) combination (T_1,T_2 and T_3) could help plants produce more number of branches, umbels and umbelets per umbel which resulted in better yields over the rest of the treatments. Similar results were reported by Prabhu *et al*. (2002)and support there findings.The lowest yield was recorded in T_5 and was on par with T_4 , T_8 and T_7.

The results of the study indicated the supremacy of inorganic, organic (FYM) and biological sources of nutrient combination (T_1,T_2 and T_3) over inorganic and organic alone.

LITERATURE CITED

Barakart, M A S and Gabr S M, 1998 Effect of different biofertilizer types and nitrogen fertilizer levels on tomato plants. Alexandria J. Agril.Res. 43: 149-160.

Gunasekaran S and Vissak 1986 Field inoculation of *Azospirillum* brasilense to cichorium intybus (L). Proc. National Seminar on Microbial Ecology, Jan. 23-26, 1986 TNAU: 16

Oken Y and Gonzalez L C A 1994 Agronomic applications of *Azospirillum*. An evaluation of 20 years world wide field inoculation Soil biology and Biol. Chemistry. 26: 1571-1601

Prabu T, Narwadkar P R, Sajindranath A K and Rathod N G 2002 Integrated Nutrient Management on growth and yield of coriander (*Coriandrum sativum* L.) South Indian Hort. 50 (4-6): 680-684.

Ray R, Patra S K, Ghosh K K and Sahoo S K 2005 Integrated Nurtient Management in Okra (*Abelmoschus esculentus* L Moench) in a river basin. Indian J .Hort. 62(3): 260-264.

Subba Rao N S 1982 Biofertilizers in Agriculture Oxford and IBH publishing Co., New Delhi. Pp:93-94

Virender Sardana (1997) Agronomic evaluation of biofertilizers to supplement inorganic fertilizers for sustained crop production. Agric.Rev. 18(2): 69-95.

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