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Effect of Foliar Sprays of Different Concentration of Trace Elements (Copper Sulphate & Ferric Sulphate) On Nodule Number, Shoot & Root Length of *Madicago Satival L.*

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Abstract-
Effect of foliar application of copper sulphate and ferric sulphate on nodule number, shoot and root length of Madicago sativa. It is also known as alfa alfa. It is perfect fooder for Milky cattle. Plant have good percentage of calcium and protein and vitamin A, D, E & K. was studied foliar effect of both trce elements inhibited the nodule number, shoot and root length where as 100 ppm & 200 ppm application proved to toxic for the same parameters.

Keywords:-
Copper and ferric sulphate foliar application shoot, root and nodule.

I. Introduction:-

The effect of foliar application of trace elements on nodulation of leguminous plant have been stanched be few workers Jones; Gupta and Agrawal reported adverse effect of higher concentration of trace elements on nodulation. Treaty et. al reported increasing concentrations of Zinc caused a decreased in nodule number and size. Kumar et. al observed that Mn and co at higher concentrations reduced number of nodules in vigna sinensis L-Sevi Ex.Hassk. The present study of foliar spray of Copper sulphate and Ferric Sulphate on nodule development and shoot and root length of Medicago sativa L.

II. Material Method :-

Seeds were surface sterilized with 0.1% aqueous $HgCl_2$ solution and sown in small earthenware pots containing equal amount of double sterilized soil. Pots were keptin glass house and precaution was taken to prevent contamination of soil with Rhizobium until inoculation. After six days of the sowing, 10 seedlings of equal size were selected and retained in each pots were inoculated with equal amounts of homogeneous suspension of an appropriate strain of Rhizobium. Latter was isolated from the effective (Pink) nodules.

Solution was prepared in three concentrations viz. 50, 100 and 200 ppm in distilled water for each chemical. Two sprays were made, first on 15 days old seedlings for two consecutive days and the second after six days of the first spraying. Control plants were sprayed with sterili8zed distilled water. Solutions were sprayed with home spray automizer. Soil contamination of solutions was prevented by covering the soil surface with sterilized cotton. Solutions were sprayed at the rate of 10 ml/plant. Sixteen days after the second spraying, plants were uprooted carefully under the tap water and nodule number, shoot and root length were recorded and data were statistically analysed.

In the case of copper sulphate and Ferric sulphate Foliar treated plants an insignificant decrease in the nodule number was notied in 50 ppm whereas a significant decrease was noticed at 100 and 200 ppm treatment.

Maximum shoot and root lengths were observed in controls as compaired to the growth in treated plants.

(Table 1)

Treatment	Concent-ration (ppm)	Mean number of nodule	Value of 't'	Mean shoot length (cm.)	Value of 't'	Mean root length (cm)	Value of 't'
Copper sulphate	Control	26.7	-	24.84	-	27.31	-
	50 ppm	24.3	2.03	22.67	2.08	25.24	1.99
	100 ppm	20.2	8.25**	20.23	10.65**	24.23	3.73**
	200 ppm	18.9	9.80**	19.79	11.59**	21.63	6.32**

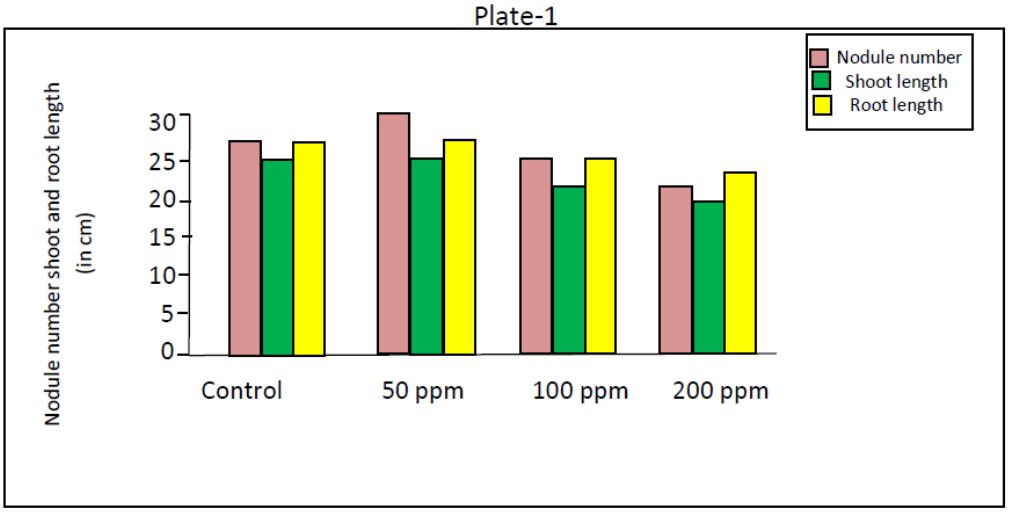
**Significant at 1 % level = 2.87
* Significant at 5% level = 2.10

(Table 2)

Treatment	Concent-ration (ppm)	Number of nodule (mean)	Value of 't'	Mean shoot length (cm.)	Value of 't'	Mean root length (cm)	Value of 't'
Ferric sulphate	Control	26.7	-	24.84	-	27.31	-
	50 ppm	23.6	1.84	23.52	2.04	25.14	1.14
	100 ppm	20.8	2.61*	21.70	5.73**	22.69	5.44**
	200 ppm	20.7	4.49**	19.27	8.74**	19.01	9.58**

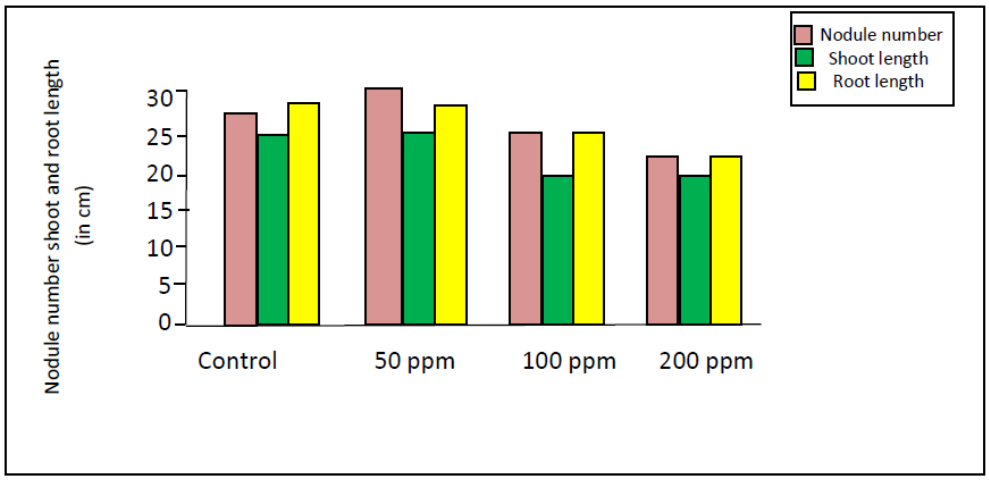
**Significant at 1 % level = 2.87
* Significant at 5% level = 2.10

Plate-1



Histogram showing the effect of foliar spray of trace element (CU) on nodule number, shoot and root length.

Plate-2



Histogram showing the effect of foliar spray of trace element (Fe) on nodule number, shoot and root length.

The present findings, so for as higher concentrations are in accordance with the earlier observation who reported that increasing concentration of copper sulphate caused decrease in nodule numbers shoot and root lengths. Several workers have also reported that Folior spray of trace elements have adverse effect on nodulation at higher concentrations previously there are reports that the increasing concentrations of trace elements caused a decrease in nodule number, shoot and root length.

In this studies that higher concentrations proved to be toxic for the growth of leguminous plants

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References:-

[1]. Jones, D.G. (1961). In : Rept. Welsh Plant breeding Station, 1960 : 39-40
[2]. Gupta, V.K. and S.B. Agrawal (1973). Effect of foliar spray of manganese sulphate and copper sulphate on nodule development shoot and root length. Indian Phytophathology, 26 (4) : 726-727
[3]. Sarda, R.L. and Polasa, H (1992). Effect of manganese, copper and cobalt on the in vitro growth of Rhizobium leguminosorum 2001 and on the symbiotic nitrogen fixation in lentil plants. Indian Journal of Agriculture research, 26 (4) : 187-194
[4]. Vieira, R.F., Cardoso, E.J.B.N., Vieira, C. and Casini, S.T.A. (1998). Foliar application of molybdenum in common bean III. Effect on nodulation. Journal of Plant Nutrition, 21 (10) : 2153-2163.
[5]. Albino, U.B. and Campo, R.J. (2000). Effect of sources and levels of Molybdenum on bradyrhizobium servival and on Biological nitrogen fixation in soybean. Pesquisa Agropequaria brasileira, 36 : (3) 527-534.
[6]. Anwarulla, M.S. (2005) Influence of molybdenum and phosphorus on nodulation, growth and yield of soybean in rice soybean sequence in hill zone of Karnataka. Mysore Journal of Agricultural Sciences, 39 (1) : 20-25
[7]. Kumar, A., Yadav, N. and Gupta, V.K. (2006). Effect of foliar sprays of trace elements (Mn and Co) on nodule number, shoot and root length of Vigna sinensis L. Sevi Ex. Hassk. J. Phytol. Res., 19 (1) : 155-156