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Seed production of Egyptian clover [*Trifolium alexandrium* (L.)] as influenced by foliar application of Zn, Mn, Mo and B on loamy sand soil

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ABSTRACT

A field experiment was conducted in department of Plant Breeding (Fodder Section) during 2002-03. Different levels of Zn, Mn, B and Mo were tested to increase the production efficiency of seed. The results revealed that different levels of micronutrients increased the seed yield of berseem in the range of 189 -312 Kg ha^{-1}. The concentrations of zinc @ 0.5 and 1.0 per cent increased the seed yield of berseem by 7.2 and 18.5 per cent, respectively, over control whereas, maximum increase in seed production efficiency was recorded by 42 per cent with foliar application of 4 Kg ha^{-1} B. The minimum per cent increase in seed production was recorded by 7.2 per cent with 0.5 per cent foliar application of zinc as $ZnSO_4$.

Key words : Egyptian clover, Zn, Mn, B and Mo levels, Seed production, Foliar application.

Both soil and foliar application of micronutrients play an important role in seed production of berseem crop but it is very difficult to manage the deficiency of Zn, Mn, B and Mo to berseem crop from the soil because the availability of native soil micronutrients changes rapidly and dramatically with change in temperature, moisture and microbial activity. All the crops respond better to foliar application of micronutrients because for soil application a large quantity of micronutrient is required which is not economical. Researchers used different micronutrients to enhance the seed yield of berseem with their different concentrations. Bansal and Nayyer (1997) reported the effect of Mn in increasing the dry matter yield of breseem. Gupta and Lipstt (1981)and Heenan and Campbell (1983) reported that seed yield of berseem can be increased to a greater extent with foliar application of Mo and Fe sprays. Though, much emphasis is being laid on the fertilization of soils and crops with Zn, Mn, B and Mo to combat its deficiency yet another approach to maximize the seed yield of berseem through foliar application of micronutrients is established to maintain the optimum seed yield of berseem on soils which are low in available micronutrients. Different genotypic differences among berseem cultivars with respect to Zn, Mn, B and Mo efficiency have been reported (Bansal and Nayyar, 2000) but the information about the seed production of berseem with foliar application of these micronutrients is lacking. So, the present investigation is undertaken keeping in view that the seed yield of berseem can be increased tremendously with foliar application of Zn, Mn, B and Mo. This paper reports the relative efficiency of four micronutrients in enhancing the seed production in Egyptian clover.

MATERIALS AND METHODS

A field experiment was conducted on Egyptian clover at department of Plant Breeding, Genetics and Biotechnology, PAU, Ludhiana. Barseem variety BL- 10 was used for cultivation during 2002-03 for production of seed with the foliar application of Zn, Mn, B and Mo. The soil was a Typic Haplustept loamy sand soil, having pH 7.75, electrical conductivity 0.27 dS m^{-1} at 25° C in a 1: 2 Soil water: suspension, organic carbon 0.48% and CEC 14.2 meq 100^{-1} gm (Table 1). The DTPA (diethylene triamine penta acetic acid) extractable Zn and Mn were 0.59 and 3.88 mg kg^{-1} soil, respectively. Available B and

Table 1 : Some physico-chemical characteristics of the experimental soil

Sr.No.	Name of Property of soil	Value
1.	pH	7.75
2.	Electrical Conductivity (EC) (ds m^{-1})	0.27
3.	Cation Exch. Capacity (CEC) (me/100 gm)	14.2
4.	Organic Carbon (OC) (%)	0.48
5.	Available Nitrogen (kg ha^{-1})	261
6.	Available Phosphorus (kg ha^{-1})	18.4
7.	Available Potassium (kg ha^{-1})	374
8.	Available Zinc (mg kg^{-1})	0.59
9.	Available Boron (mg kg^{-1})	0.40
10.	Available Molybdenum (mg kg^{-1})	3.88
11.	Available Manganese (mg kg^{-1})	4.25
12.	Bulk Density (g cm^{-3})	40.0
13.	Water Holding Capacity (%)	38.0
14.	Sand (%)	74.4
	Silt (%)	14.7
	Clay (%)	10.9
	Texture	Loamy Sand
15.	Fungal Count (g $^{-1}$ Soil)	$14x10^3$
16.	Bacterial Count (g $^{-1}$ Soil)	$30x10^3$
17.	Actinomycetes Count (g $^{-1}$ Soil)	$10x10^3$