

A Note on the Effect of Ethylene Diamine tetraacetic Acid and Ferrous Ammonium Sulphate on Yield of *Allium Cepa*.

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Introduction :

A number of organic and inorganic chemicals have long been used for observing their effects on the morphological and yield characteristics of the plants (Miller 1). While some have been shown to be working as auxins when added in small concentrations (Went 2, Shimoda et al. 3) and Briggs 4), the others have been shown to be dangerous even when applied in small measures. The use of the former group of chemicals has the advantage that a comparatively higher return is possible with their applications in small concentrations incurring little expenditure.

A search of literature will show that the effect of EDTA and FAS, along the lines of the useful group mentioned in the previous paragraph, on vegetables, especially *Allium cepa* has been little studied. In the present paper an attempt has been made to see the effects of different concentrations of EDTA and FAS on the height of the onion plant as well as its yield.

Experimental :

0.1%, 0.5% and 1.0% of solutions of EDTA and FAS (both AR) were prepared separately in aqueous medium. In twenty-six earthen pots 1.5 kg per pot soil was taken and two seedlings of *Allium cepa* were sown in each pot. Equal quantity (about 500 ml) of tap water was then added to each pot. Out of these twenty-six pots, six pots were kept for plant spraying and another six pots for soil spray by FAS. Similarly six pots were used for plant spray and another six pots for soil spray by EDTA. The last two pots were kept as control.

The height of the aerial shoot of each seedling was measured in cm. and 10 ml of the solution of each concentration of FAS (ie., 0.1% 0.5% and 1.0%) were sprayed over the desired plants. 10 ml of this solution in concentrations mentioned above were also sprayed over the required soil surface. Likewise spraying by EDTA was done both on the plants and over the soil surface in the pots kept for this purpose. The control set was not treated with any of the compounds and it was kept as such.

Table I

Effect of EDTA and FAS as soil spray on the height of the onion plant and weight of the onion bulbs

Physiological stage of the plant	Average height (cms.) and weight of the bulbs (g.)						
	EDTA			FAS			Control
	0,1%	0,5%	1,0%	0,1%	0,5%	1,0%	
Seedling stage	10,2	12,5	13,1	11,6	11,6	9,7	12,7
Tillering stage Early stage	18,1	20,6	25,0	14,5	13,7	24,0	16,5
After one month of this stage	28,0	38,0	43,5	26,0	30,2	40,3	27,8
After two months of this stage	36,0	44,0	47,3	41,0	32,0	35,0	35,0
Yield/plant	1,13	3,13	3,80	2,39	2,01	2,25	1,80

Table II

Effect of plant spray by EDTA and FAS

Physiological stage of the plant	Average height (in cms.) and weight of the bulbs (in g.)						
	EDTA			FAS			Control
	0,1%	0,5%	1,0%	0,1%	0,5%	1,0%	
Seedling stage:	10,0	13,0	12,0	11,0	13,0	11,0	13,0
Tillering stage: Early stage:	21,0	20,0	24,0	14,0	13,0	20,0	21,0
After one month of this stage:	33,0	33,5	40,0	20,0	21,0	30,0	38,0
After two months of this stage:	35,0	37,0	40,0	31,0	33,0	34,0	38,0
Yield/plant:	1,02	3,21	3,42	1,12	1,42	0,5	1,6

After one month interval of time, the heights of the plants of all the pots were measured and measurement was repeated after another month. In the last measurement of the plant height, the onion bulbs observed in each pot were also weighed.

Results and Discussion:

In tables 1 and 2 the values given clearly show that the mode of application of EDTA and FAS and their concentrations do produce an influence on the height of the onion plant and its yield. It may be observed that generally soil application gives better results than plant spraying and that the effects of the two compounds have become more pronounced as the plants attain maturity. Since 1.0% of EDTA application both as plant spray and soil spray give best results so far as the weight of the bulbs and height of the plants are concerned, this shows that the increased yield in comparison to the control is due to greater metabolic activity at the applied optimum concentration (1.0%) of EDTA.

The effects of FAS is not pronounced when it is applied as a plant spray probably due to greater immovability of iron. This is, however, not so when it is applied as soil spray, perhaps due to the fact that plants absorb this particular nutrient gradually from the soil as the need increases.

It may, therefore, be concluded that in order to get increased yield of onion, 1.0% of EDTA may be applied especially to the soil as described earlier. If FAS is to be used, 0.1% of the salt may be added at particular intervals of time only to the soil and not to the plant.

References:

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