

## **EFFECT OF GOAL ON SEED GERMINATION AND EARLY SEEDLING GROWTH OF *Medicago Sativa* Linn**

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### **ABSTRACT**

The seeds of *Medicago sativa* Linn were treated with various concentrations of GOAL for 24 hours and germinated under laboratory conditions.

Goal (2'-Chloro-4'- trifluoro-methyl phenyl 3-ethoxy-4-nitrophenyl ether) was found to be most efficient in inhibiting seed germination the lethal dose was 1.33 at 2500 ppm as against 73.11% in control. The reduction in length of hypocotyl and radical was observed.

Besides this swollen hypocotyl and radical were rottened on sixth day after Goal treatment.

**Keywords:** *Medicago sativa*, Goal, Seed germination and seedling growth.

### **INTRODUCTION:**

Seed is most important unit for the propagation of weeds. Weeds take lion's share of plant nutrients. Klingman (1961) observed that for every pound of weed growth the soil produces about one pound of weed growth hence, the soil produces about one pound less of crop. Hence, to prevent the loss of agricultural yield the weeds are treated with herbicides. The present study carried out to evaluate the effects of goal.

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## **MATERIAL AND METHODS**

Seeds of *Medicago sativa L.* were collected from the naturally growing plants of different places in Maharashtra especially in Vidarbha region. The seed were kept for germination fortnightly to see the germination process. Goal dissolves directly in the water. The concentrations of Goal ranging from 500 to 5000 ppm were used to treat one hundred seeds respectively.

## **RESULTS AND DISCUSSION**

Goal was found to be very efficient in checking the germination of seeds. The germination percentage gradually decreased with increase in concentration of Goal. At 3000 ppm the germination was zero as against control 73.11 in control, therefore this concentration was determined as lethal dose for germination the pH of the control and 3000 ppm was 7.5 and 6.9 respectively. (Table 1)

The gradual inhibition of growth of seedling was observed. Thus, growth in length of the hypocotyl decreased at 2500 ppm it was 3.4 mm, and 3.40 mm respectively. As compared with control.

Morphological changes were not observed in seedling except the swelling of hypocotyl at 2000 ppm and onwards. The colours of cotyledon become pale green to brown and radicle were rottened on sixth day. This was observed at all concentrations. (Fig 1 and 2)



**FIG. Goal treated seedlings on forth day**



**Fig.2. Goal treated seedlings on seventh day**

**Table 1**

**Showing percentage of germination % of seeds and length of hypocotyles and radical (in mm) in seven days old seedlings at various concentrations of Goal.**

<b>Herbicide</b>	<b>Concentration in PPM</b>	<b>Germination percentage</b>	<b>Standard error (I)</b>
<b>Control</b>	Tap water 50ml	73.11	14.7
<b>Goal</b>	500	56.66	1.15
	1000	51.33	2.30
	1500	44.00	9.53
	2000	32.66	20.84
	2500	1.33	0.57
	3000	0.0	0.0

In present study, Goal was observed to be both pre and post emergence control. It forms of a soil barriers to block of the new emerging weeds and actively controls growing seeds. Some workers like Chisaka et. al; (1967 b) observed that germination was stimulated by same group relatively at higher concentrations in *Eichinochla aria* etal, (1967) and Chancellor (1968) found that Tok E-25 (Dinitrophenyl group) stimulated.

**Table 2**

Hypcotyl / length	Standard error ( $\pm 1/2$ )	Radicle length	Standard error $\pm$
24.7	1.21	6.0	1.69
12.1	3.41	3.9	1.48
8.0	2.90	3.8	0.95
6.0	1.71	3.5	0.88
4.0	0.81	3.4	1.07
3.4	1.07	3.4	1.07
0.0	0.0	0.0	0.0

No such stimulation observed in the present study but inhibitory action of good was noticeable at all concentrations. Deshmukh (1981) in *Malvastrum coromandelianum*, *Tridax procumbens* and *Phaseolus trilobus* found growth of hypocotyl and radicle very much stunted when treated with Tok E-25. The process of germination was totally inhibited. Goal found to be capable of arresting growth of hypocotyl and radicle of the seedlings. Similar findings are reported by Audus (1949) in *Lipidium sativum*.

## **CONCLUSION:**

Seed germination and seedling growth was inhibited by Goal herbicide which gets as strong inhibitory agent. Herbicide uptake probably affected the

cell division and cell elongation, which ultimately resulted in the decrease in the length of the seedlings.

## **REFERENCES:**

1. Audus, C.J. (1949) Studies on the pH relationship of root growth and its inhibition by 2, 4-D and Caumarin *New Phytol* 49: 97-114.
2. Bakale , V.L. and Dnyansagar, V.R. (1971). Effect of weedicides on germination of seeds of Aftermanther polygonides, *Cressa cretica* and *Xanthum strumarium* J Uni. Bombay (Sci.) 11 (67) : 25-42.
3. Deshmukh, V.R. (1981). Effect of Weedicides on Cytomorphology of Weeds. Ph.D. Thesis, Nagpur University, Nagpur
4. Klingman (1961) , Weed Control : As a Science; from Book Department (Shephered Town, WV.USA)
5. Taduwadi (2004): Effect of Agrochemicals on Cytomorphology of Weed *Cleome viscosa* Linn. Ph D Thesis, Nagpur University, Nagpur