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EFFECTS OF 2 (CHLOROETHYL) TRIMETHYL AMMONIUM CHLORIDE (CCC) ON YIELD AND RELATED CHARACTERS IN GRAM VARIETY C-727

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The effects of 2 Chloroethyl – trimethyl – ammonium chloride at three concentrations, i. e., 800 ppm, 1000 ppm and 1200 ppm by soaking were studied on the yield of gram (Cicer arietinum L.) variety C-727. The characters studied were number of flowers, number of pods, weight of dry seeds, number of seeds per plant, pod set percentage and pod size. The results were significantly better in all the sets of CCC- treated plants than control. The treatment, 1000 ppm CCC gave the most significant results for all the characters studied and proved to be an optimum dose. Substantial yield increase was also observed.

INTRODUCTION

Gram, for its high nutritive value, constitutes an important part of the common man's balanced food in Pakistan. Research is under-way to promote increased production of this crop to keep pace with the ever increasing demand for this commodity. CCC application is known to have increased yield of certain crops. Halevy and Shilo (1970) applied CCC to gladiolus plants and observed that CCC treated plants showed stimulation in stem length and increase in the number of flowers per plant. Mishra and Pradhan (1972) reported increase in the numbers of flowers in tomato plant with CCC treatment. Rowland (1973) applied CCC, 40 days after sowing of wheat and observed increase in grain yield. Ivanenko and Zolotarev (1974) observed that foliar application of CCC to spring wheat increased grain yield by 200-250 kg/ha. Kosturski and Atanasov (1975) increased grain yield by 850 and 815 kg/ha in wheat and also observed a reduction in 1000 grain weight. Bauer (1976) observed that application of CCC as seed treatment and foliar spray increased grain yields even in lodged crops. These studies inspired the present study on gram variety C-727, a commercial variety.

MATERIALS AND METHODS

Equal quantities of seeds were soaked for 24 hours in 800 ppm, 1000

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ppm and 1200 ppm concentrations of CCC and the seed soaked in distilled water served as control. The seeds were sown in three replicates for each treatment, the sowing was done on the 4th November, 1977.

Observations were recorded on number of flowers per plant, number of pods per plant, pod size, percentage of pod-set per plant, number of seeds per plant and the weight of dry seeds per plant.

Ten plants from each replicate were selected and the flowers of the selected plants were counted at noon every day. The counts were made throughout the bloom, the average number of flowers per plant was calculated for each concentration.

At maturity, the total number of pods per plant were counted. The percentage of pod-set was calculated by the following formula:

$$\frac{\text{Total number of pods/plant}}{\text{Total number of flowers/plant}} \times 100$$

The length of pod was measured in centimeters. Number of dry seeds per plant was counted and weighed.

The data were analysed statistically. The treatment means were compared by Duncan's multiple range test.

RESULTS AND DISCUSSION

Comparative treatment data presented in Table 1 and fig. 1 and 2 indicated that the seed treated with 1000 ppm CCC resulted in significant positive increase for the characters, i. e., number of flowers per plant, pods per plant, pod size, percentage of pods setting, seeds per plant and the seed yield per plant. There was clear evidence of the superiority of 1000 ppm CCC treatment for an overall increase in all the characters studied. These results were in full agreement with those of Mishra and Pradhan (1972) and Balquise (1976). Mishra and Pradhan (1972) recorded significant increase in the number of flowers and other relevant characters with CCC treatment in tomatoes. Balquise (1976) reported similar increase in gram crop. Earlier, studies of Halevy and Shilo (1970) and Rowland (1973) were also indicative of increase in yield and their respective components. Ivanenko and Zolotarev (1974) tried foliar application of CCC and noticed similar positive effect. Bauer (1976) reported comparative data on seed treatment and foliar application of CCC. According to him, CCC was effective in increasing the grain yield in whatever the way it may be applied foliar spray or seed treatment.

Table 1 : *Statistical comparison of treatment means of different characters of gram.*

Treatment Concentration of CCC	No. of Flowers per plant	No. of pods per plant	Pod size (Length) in cm.	Pod set percentage per plant	No. of seeds per plant	Weight of dry seed/ plant (gms.)
Control	253.66 d	117 c	1.5 c	46.12 d	126 d	21.03 c
800 ppmCCC	372 c	206.3 b	1.6 c	55.46 b	250.33 c	35.35 b
1000ppmCCC	474.33 a	391 a	2.4 a	82.43 a	606.33 a	65.41 a
1200ppmCCC	404 b	206.66 b	2.2 b	51.15 b	357.66 b	41.83 b

In the present investigation 1000 ppm CCC proved to be quite effective for earlier flower initiation. The treated plants were in full bloom about a week before the check. Another treatment, i. e., 1200 ppm CCC came next in potency to enhance growth of the various characters, though for characters like number of pods per plant and weight of dry seed per plant the differences produced by these two treatments (1000 ppm and 1200 ppm) were not significant. From these studies, it may be concluded that CCC application could play a positive role in gram production, although techniques would have to be carefully developed to make the use of this alkaloid an attractive economic proposition.

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