

INFLUENCE OF CCC ON GROWTH AND YIELD OF WINGED BEAN (*PSOPHOCARPUS TETRAGONOLOBUS* (L) DC)

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Experiments were carried out to improve the quantitative and qualitative characters of winged bean (*Psophocarpus tetragonolobus* (L) DC) with the foliar application of CCC (2-chloro ethyl trimethyl ammonium chloride), at different concentrations. The vegetative characters like root length, shoot length, number of leaves, number of nodules and volume of the nodules were increased with the treatment of CCC. The yield parameters like pod length, pod circumference, pod weight, number of seeds/pod and weight of seeds/pod were also increased. The most significant values were obtained with CCC at 250 ppm.

Keywords: CCC; Vegetative Characters; Winged bean; Yield parameters.

In the developing countries, cultivation of legume is the best way of augmenting the production of the tropical legume, for food proteins. In the present study, winged bean (*Psophocarpus tetragonolobus* (L) DC) is selected to enrich the deficient diet with high quality protein. The sprouts, shoots and leaves of winged bean have the highest vitamin A ever recorded in a tropical plant. Pods and seeds are rich in proteins, oil, minerals, vitamins and essential amino acids. The tubers have four times, the protein content of Potato. Young pod makes a succulent green vegetable and seeds virtually duplicate soyabean in composition and nutritional value and hence it has gained the name "Poorman's Soyabean". To improve the plant, quantitatively and qualitatively, 2-chloro-ethyl-trimethyl ammonium chloride (CCC) has been used.

The pot culture and field experiments were carried out for studying various morphometric characters of winged bean. The concentrations of CCC used were 250 ppm, 500 ppm, 750 ppm and 1000 ppm along with a control. Three foliar sprays of CCC were given at an interval of 7 days. On the 60th day, the plants were uprooted and the vegetative characters were studied and recorded.

The design followed to study the pod and seed characters was randomized block design. Three foliar applications were given

at flowering stage. On maturity, 20 pods at random were collected and yield characters were analysed and recorded. The data obtained were statistically scrutinized and the results were drawn.

The data obtained for the root length varied from 55.57 cm (control) to 85.43 cm (1000 ppm). All the treatments of CCC proved to be significant in increasing the root length of winged bean. The number of nodules and its volume increased significantly with the application of CCC at all the treatments (Table 1).

The present investigation showed an appreciable increase in the pod and seed characters of winged bean with the increasing concentration of CCC. A significant increase in the length of pod was noted in all the treatments, 250 ppm (18.93 cms), 500 ppm (19.25 cms), 750 ppm (19.72 cm) and 1000 ppm (20.59 cms) when compared to control (18.22) (Table 2).

The circumference of the pod increased significantly at 250 ppm (8.80 cm), 500 ppm (08.85 cm), 750 ppm (09.12 cm) and 1000 ppm (09.50 cm) when compared with the control (8.02 cm). All the treatments given, increased the weight of the pod (250 ppm - 22.4 gm, 500 ppm - 25.75 gm, 750 ppm - 28.15 gm, 1000 ppm - 34.65 gm) when compared with the control (18.7 gm). The

Table 1. Influence of CCC on Vegetative Characters.

Plant Characters	Control	250ppm	500ppm	750ppm	1000ppm	S.E.	C.D.
Shoot length (Cm)	74.71	89.37	98.5	100.86	107.86	13.67	20.26
Petiole length (Cm)	10.07	10.0	9.14	9.79	9.79	0.74	1.1
Internodal length (Cm)	1.86	1.86	1.57	1.79	1.71	0.33	0.48
Number of leaves	49.14	29.86	45.3	47.0	50.86	6.81	10.1
Number of nodules	16.5	17.33	20.14	22.14	26.17	4.84	7.2
Volume of nodule	0.16	0.19	0.2	0.23	0.31	0.07	1.02
Root length (Cm)	55.57	60.31	63.0	73.86	85.43	10.80	16.0

Table 2. Influence of CCC on the Yield Parameters.

Pod Characters	Control	250ppm	500ppm	750ppm	1000ppm	S.E.	C.D.
Pod Circumference (Cm)	8.02	8.8	8.85	9.12	9.5	0.86	1.27
Weight of Pod (Gm)	18.7	22.4	25.75	28.15	34.15	4.8	7.2
Number of Seeds/Pod	10.25	10.83	12.04	12.62	12.62	3.39	1.76
Weight of Seeds/Pod (Gm)	4.9	6.2	6.24	6.9	7.49	8.99	1.31
Pod length (Cm)	18.22	18.93	19.25	19.72	20.59	1.18	1.74

number of seeds per pod raised in all the concentrations significantly. The seeds weight/pod increased at all the concentrations of CCC and the most significant value was obtained at 1000 ppm (7.49 gm) when compared to control (4.94 gm) (Table 2). The yield parameters increased with the treatments of CCC at different concentrations.

As in the present study, the quality of tubers were increased with CCC treatments in Faba bean¹ and in Potato². The number of nodules and its volume increased significantly with the treatments of CCC. This is in agreement with the work done by Shah and Prathapasenan³ in *Vigna radiata*.

Increase in yield after CCC application was found in groundnut⁴, *Phaseolus vulgaris*⁵, cluster beans⁶, Soyabeans⁷ and *Vigna*

*radiata*⁸. Similar results were observed in the winged beans.

References

1. Soleman N K, Mikhial M S, Horb R K and Khalil E M 1988, *Egyptian Journal of Phytopathology* 20 (1) 1
2. Shadeque A and Pandita M L 1982, *Journal of Research, Assam* 3 (1) 34
3. Shah T and Prathapasenan G 1993, *Biochemic and Physiologic der Pflanzen* 188 (6) 373
4. Singh Gurbakh and Sharma B 1982, *Indian Journal of Ecology* 9 (2) 281
5. Rafique - Uddin M 1984, *Legume Research* 7 (1) 43
6. Singh S J P and Rajput C B S 1985, *Progressive Horticulture* 17 (3) 181
7. Singh Harshan, Chandra S and Jolly R S 1986, *Annals of Biology* 3 (1) 36
8. Wasink K G and Bagga A K 1992, *Indian Journal of Plant Physiology* 35 (1) 104