Asian J. of Bio Sci. (2007) Vol.3 No. 1 : (229-230)

Research note

Effect of foliar application of growth regulators on seed yield and yield components of soybean [*Glycine max* (L.) Merrill.]

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(Accepted : January, 2008)

Key words : Growth regulator, Foliar spray, Soybean, CCC, NAA.

Soybean (*Glycine max* (L.) Merill.) is an important grain legume crop of the world. Its importance is increasing day by day because of its high nutritive value. Due to high content of protein it is known as poor man's meat. In addition to protein, it also contains carbohydrates and vitamins.

In general, water, light, carbohydrates and minerals are required by any plant for its growth. However, growth hormones which are involved in biochemical reactions of metabolism are indispensable for normal and better growth of plant. The use of plant growth regulators is most important tool for the agriculturist to increase the yield.

The growth and behavior of may crop plants can be modified and controlled by applying small amount of growth hormones to seed, roots and leaves. Auxins are the organic substances which promote growth along the longitudinal axis, when applied in low concentration to shoot of the plant. Gibberellins are involved in elongation stem, expansion of leaves, production of dry matter and root growth. The use of cycocel shortens and strengthens the stem of plants thereby reduces losses of cereals caused by lodging.

Hence, the present investigation was undertaken to study the effect of GA, NAA and CCC on yield and yield components of soybean.

The experiment was conducted on the fields of department of agricultural university, Parbhani kharif 2005. The certified seeds of three soybean verities viz., MAUS 61, MAUS 61-2 and MAUS 71 were obtained from soybean Research Station, Parbhani. The plants were treated with foliar application of various concentrations fo GA3, NAA at 30 days after sowing and CC after 40 days after sowing. Untreated plants were used as control.

The experiment was laid out in factorial randomized block design with two replications. The sowing was done with spacing of 5 cm plant to plant and 45 cm row to row distance. The 100, 150 ppm GA3 and 50 and 100 ppm solutions of NAA were prepared by dissolving the 100 mg, 150 mg GA and 50 mg, 100 mg of NAA respectively in small quantity of acetone. It was then made to 1 lire by adding double distilled water to obtain 100 ppm, 150 ppm of GA3 and 50 ppm, 100 ppm of NAA concentratios. The cycocel concentrations were prepared by using micropipette with a quantity of 200 and 250 microlitres of CCC and poured into volumetric flask and the volume was made 1 litre using distilled water. Five plants per treatment were randomly selected from each entry for recording biometric observations.

The observations were recorded for number of pods per plant. Number of grains per pod, weight of straw per hectare, 100 seed weight and grain yield per hectare and harvest index.The data for above characters are presented in Table 1. It indicates significant differences among the variety and treatments for all the characters studied.

The variety MAUS 61-2 recorded significantly superior number of pods per plant, biological yield, grain yield and harvest index than MAUS-61 (VI) and MAUS 71(V3).The variety MAUS-61-2 (V2) recorded significantly more number of grains per pod over MAUS-71 (V3). The variety MAUS-61 (V1) and MAUS-71 (V3) were at par with each other.

The variety MAUS-61 (V1) recorded significantly superior 100 seed weight over MAUS-61-2 (V2) and MAUS-71(V3). The variety MAUS-71 (V3) was also recorded signficantly superior 100 seed weight over MAUS-61-2 (V2).

All the concentrations of GA3, NAA and CCC increased the number of pods per plant, number of grains per pod, 100 seed weight, harvest index, grain yield and biological yield significantly than the control. The use of NAA 50 ppm and 100 ppm had significant positive effect

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Table 1 : Effect of foliar application of growth regulators on yield and its components of soybean (*Glycine max* (L.) Merill.)

Treatments	No. of pods/ plant	No. of grains/pod	100 seed wt. (g)	Grain yield (kg/ha)	Biolo- gical yield (kg/ha)	Harvest index (%)
V_1 – MAUS -61	50.97	2.35	12.08	21.79	47.51	45.69
V_2 – MAUS -61-2	54.55	2.46	11.16	23.53	49.07	48.08
V_3 – MAUS-71	49.61	2.27	11.61	21.45	46.54	46.05
S.E. +	0.16	0.04	0.08	0.08	0.13	0.15
CD at 5 %	0.49	0.13	0.25	0.25	0.38	0.44
T_1 – Control	42.08	2.06	10.09	19.27	44.58	43.23
T_2 – GA3 100 ppm	52.75	2.37	11.65	22.33	48.11	46.53
T_3 – GA3 150 ppm	53.74	2.47	11.54	21.65	47.20	45.57
T_4 – NAA 50 ppm	54.09	2.39	11.73	22.84	48.59	47.00
T_5 – NAA 100 ppm	54.52	2.43	11.72	23.10	49.05	47.05
T_6 – NAA 200 ppm	52.34	2.44	12.29	23.11	48.30	48.05
T_7 – CCC 250 ppm	52.47	2.46	12.30	23.51	48.13	48.89
S.E. +	0.25	0.07	0.13	0.13	0.19	0.23
CD at 5 %	0.75	0.21	0.38	0.39	0.58	0.68

on number of pods per plant and biological yield (q/ha). Similar results due to growth regulators were reported by Mehetre and Lad (1995). The treatment CCC 250 ppm (T7) was found significantly superior over control to increase number of grains per pod, 100 seed weight, however, it was found at par with rest of all treatments.

The next best treatment was CCC 200 ppm (T6) to increase number of grains per pod over control. However, it was found at par with all the treatments. The same treatment (T6) was found to be significantly superior for grain yield (q/ha) and harvest index over control.

The treatment CCC 250 ppm (T7) was found significantly superior over control and all the treatments for grain yield but it was found at par with the treatment CCC 250 ppm (T6) and NAA 100 ppm (T5). The treatment NAA 100 ppm (T5) was found significantly superior to increase biological yield over control and all the treatments. However, it was found at par with NAA 50 ppm (T4). The next best treatment to increase biological yield was NAA 50 ppm (T4). However, it was found at par with the treatments GA3 100 ppm (T2), 200 ppm (T6) and CCC 250 ppm (T7). Similar results were reported by Patel and Saxena (1994), Zhao et al. (1995), Maske et al. (1998) and Tagade et al. (1999).

REFERENCES

Maske, V.G., R.D. Deotale, N.V. Sorte, H.B. Gormnagar and C.N. Chore (1998). Influence of GA3 and NAA on growth and yield contributing parameters of soybean. *J. Soils and Crops*, **8**(1):20-22.

Mehetre, S.S. and S.K. Lad (1995). Effect of foliar application of growth substances on growth and yield of soybean. *Genetics Newsletter*, **22**:132-134.

Patel, I. and O.P. Saxena (1994). Growth and yield of back gram as influenced by seed soaking treatment of plant growth regulators. *Legume Res.*, **17**(1):65-69.

Tagade, R., R.D. Deotale, S. Sable and C. N. Chore (1998). Effect of IAA and kinetin on biochemical aspects and yield of sorghum. *J. Soils and Crops*, **8**(2):172-175.

Zhao, H.J. and X. W. Lin, (1993). Effect of some phenolic compounds on the physiological characteristics in leaves and growth of main stem of soybean. *Plant Physio. Comm.*, **29(**1):41-43.