

EVALUATION OF AMINO (A BIOSTIMULANT) ON GROWTH AND YIELD OF SOYBEAN

R.S. Knot, N.S. Kamar, S.B. Patil and Kantesh. G.
(Agricultural Research Station, Sankeshwar, UAS, Dharwad)

Abstract

The field experiment was conducted at Agricultural Research Station, Sankeshwar (Karnataka) to evaluate effect of Amino (a biostimulant) on the growth and yield of soybean during kharif season of 1995. The Amino powder (soil application) and liquid (spray) was evaluated individually and also in combination of soil application and spray.

Soil application two times at 30 and 45 DAS increased yield of soybean by 362 kg/ha compared to control which differed significantly. Giving 3 sprays at 40, 55 and 70 DAS increased yield by 264 kg/ha over control but differences were non-significant when both soil application at 30 DAS @ 20 kg/ha, combined with 3 sprays at 40, 55 and 70 DAS increased yield by 635 kg/ha over control and 422 kg/ha over only once soil application at 30 DAS. Similarly 375 kg/ha with only liquid spray 3 times at 40, 55 and 70 DAS. The effect of Amino biostimulant was more pronounced when both soil application and spray was applied in combination than individual application.

Introduction

Soybean a newly introduced crop in southern India is gaining popularity since nineteen eighties. Due to high yield potential and multifold uses, the area under soybean is steadily increasing. The crop is well suited for agro climatic conditions of southern India particularly during kharif season. It is a short duration crop and farmers are able to get returns early compared to other crops. Soybean is well suited for mixed, relay and multiple cropping systems. It is also one of the best rotational crops for sugarcane based cropping systems. During kharif soybean is grown and in the same filed autumn planting of sugarcane is taken, thee by farmer gets returns from soybean and manages his succeeding sugarcane crop to get higher yields, and this is the major cause for early spread of this crop in sugarcane belt areas.

In view of new uses being developed in large acreage of agronomical crops, plant growth regulators, biostimulants of growth retardants have recently become the most rapidly growing segment of the agricultural chemical industry. In this area of research begins to pay dividends. No opportunity for plant growth regulators, biostimulants or growth retardants is more obvious than the potential for achieving great progress in crop production. As these chemicals are required in minor quantities the cost benefit ratio is much higher as compared to all other inputs. Bhale (1993) observed that amino acid caused a considerable stimulation of germination and growth of sugarcane at later stages resulting in increased production of both cane and sugar yields. Kamlesh Kanawar (1991) reported beneficial effect of Kinetin treated plants in sugarcane due to low mortality percentage of tillers resulting into high number of canes per pit and significant increase in ratoon cane yield. He also reported that, the increase in yield in G.A. treated plants was due to significant increase in the length of cane both in plant and ratoon crop of sugarcane. Patil et al., (1996) observed that the growth retardant TIBA benefited to improve soybean yield due to significant increase in yield components like seed weight, number of pods and grains per plant over control.

It was thought to evaluate Amino Powder and Liquid on the growth and yield of soybean. Amino contains 119 g/kg of powder or per liter of liquid free amino acids and 2 to 3 percent of nitrogen.

Materials and Methods

The field experiment was conducted at Agricultural Research Station, Sankeshwar (Karnataka) during kharif season of 1995 under vain fed condition on shallow red loam soil. In all nine treatments including control were replicated four times in Randomised Block Design. The JS-335 most promising variety of soybean was used in the experiment. The crop was sown on 18/7/1995 and harvested on 10/10/1995. The recommended dose of fertilizer (20:80:40-N:P:K kg/ha) was applied at the time of sowing. The plot size was 5 m x 1.8 m. The treatments were imposed as shown in Table 1. The observations were recorded on yield attributing factors like plant height, number of branches, number of pos, grains/plant and 100 grain weight and finally yield was recorded after harvest of the crop. Both Amino Powder as soil application and Liquid as spray were tried individually and in combination.

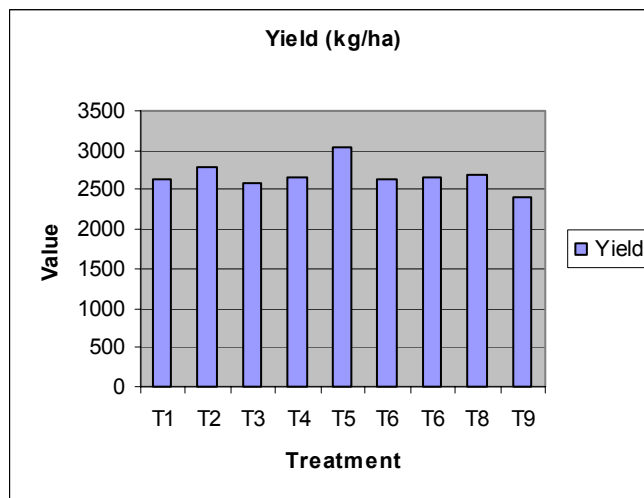
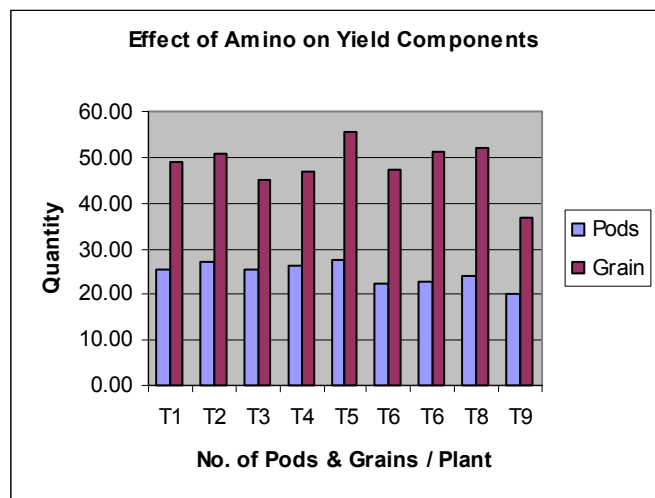
Results and Discussion

The yield attributing parameters and yield in kg/ha as influenced by various treatments in comparison with control (no application) are tabulated in Table 1.

Though the differences were non-significant in respect of plant height and number of branches due to various treatments. The plant height and number of branches were more in case of 5th treatment where Amino Powder was applied at 30 DAS followed by 3 sprays at 40, 55 and 70 DAS. There was significant difference in average number of pods and grains/plant. Soil application of Amino Powder at 30 DAS at the rate of 20 kg/ha followed by 3 sprays of Amino Liquid at 40, 55 and 70 DAS increased average number of pods and grains/plant by 7.34 and 19.90 respectively over control. This may be due to mobilisation of photosynthate from source to sink. Singh and Sarkar (1976) in soybean, the results are in accordance with Patil et al., (1996) Basuchoudhari et al., (1986) and Banet et al., (1972).

Table 1 – Effect of Amino Powder and Liquid on the growth and yield of soybean during 1995-96 (kharif) at Agricultural Research Station, Sankeshwar

Treatments	Average Height of plant (cm)	Average Number of Branches/Plant	Average Number of pods/plant	Average Number of Grains/Plant	100 Grain weight in grams	Yield in kg/ha	% increase over control
Soil application of Amino Powder at 30 DAS @ 20 kg/ha	54.50	2.86	25.55	48.85	11.37	2633	10.19
Soil application of Amino Powder at 30 DAS and 45 DAS 20 kg/ha	53.45	2.95	27.00	51.00	11.95	2778	15.20
Treatment No. 1 + spraying Amino Liquid at 40 DAS	55.85	3.20	25.25	45.20	12.25	2597	7.60
Treatment No. 1 + spraying Amino Liquid at 40 and 55 DAS	54.10	3.30	26.25	46.80	11.42	2667	10.50
Treatment No. 1 + spraying Amino Liquid at 40, 55 and 70 DAS	57.70	3.35	27.40	55.55	12.40	3055	26.67
Spraying of Amino Liquid at 40 DAS	49.35	3.15	22.15	47.15	11.42	2639	9.35
Spraying of Amino Liquid at 40 and 55 DAS	52.85	3.05	22.95	51.20	11.52	2653	9.95
Spraying of Amino Liquid at 40, 55 and 70 DAS	53.25	3.15	24.20	51.95	38.27	2680	11.08
Control (no application)	50.95	2.85	20.05	36.65	10.80	2416	-
C.D. @ 5%	NS	NS	3.49	8.34	NS	300.93	-
C.V. %	10.00	21.62	9.75	11.85	6.18	7.69	-



Yield

There was significant difference in the yield of soybean due to various treatments. Application of Amino Powder 30 DAS @ 20 kg/ha increased yield of soybean by 217 kg/ha over control but difference were non significant. But when applied two times, once at 30 DAS and once at 45 DAS increased yield of soybean by 362 kg/ha over control which differed significantly over control.

In respect of spraying liquid Amino alone @ 1 percent solution. One spray at 40 DAS increased yield of soybean by 9.35 percent, two sprays at 40 and 55 DAS increased yield by 9.95 percent where as 3 sprays at 40, 55 and 70 DAS increased yield of soybean by 11.08 percent over control. Soil application in the form of powder had better beneficial effect compared to spray.

When individual applications were compared with combination of application. Combination of soil application and spray had much more beneficial effect on the yield of soybean. Soil application of Amino Powder at 30 DAS followed by 3 sprays at 40, 55 and 70 DAS had highest yield of soybean. This treatment recorded 635 kg/ha more yield than control which differed significantly. When compared with soil application this treatment increased the yield by 422 kg/ha more than one application (Treatment No. 1) and 375 kg/ha more yield than only 3 sprays which differed significantly. This clearly indicates that, combination of soil application followed by spray had more pronounced effect on the yield of soybean.

The increase in yield of soybean can be attributed to significant increase in number of pods and grains/plant as number of pods and grains/plant were more by 7.34 and 19.90 respectively. These results are in accordance with Ravikumar and Kulkarni (1988), Singh and Sarkar (1976) and Patil et al., (1996) in soybean crop.

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