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Influence of Growth Regulators and Nutrients on Yield and Yield Components in Soybean(*Glycine max* L)

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ABSTRACT

An experiment was conducted in FRBD (Factorial Randomized Block Design) with two main factors and eight sub factors to know the effect of growth regulators and nutrients on yield components in different cultivars of soybean at college farm, Agricultural college, Bapatla during rabi 2005-2006. Of allthe treatements Triacontanol @1ml L^{-1} recorded maximum yield (24.72 q ha^{-1}), followed by SA @ 10 ppm (24.06 q ha^{-1}) and NAA@ 10 ppm (23.04q ha^{-1}) over control (20.06 q ha^{-1}) .

Key words : Growth regulators, Nutrients, Soybeans yield components , Yield.

In India .soybean is an important grain legume and its importancy is increasing day by day due to its higher nutritive value . It has high proten content among all the legume crops. Unfortunately there has been no significant increasing in the soybeen productivity of India (1.1 t ha^{-1}) compared to world (2.2 t ha^{-1}) and Asia (1.5 t ha^{-1}) . The large gap between average yield of world and india can be decreased by using plant growth regulators. Hence the present investigation was done to assess the effect of foliar spray of growth regulators and nutrients on yield and yield components of the soybean . Pushpaka Kumari et al (1993) reported that the potential yield range in soybean was from 13.38 to 23.19 q ha^{-1} .

MATERIAL AND METHODS

A field experiment was conducted at college farm, Agricultural college, Bapatla (AP) in block soil during the rabi 2005 - 06. Factorial randomized block design concept was adopted with 3 replications. The main factors were 2 genotypes of soybean i.e JS-335 and Nirmal – 111,eight sub factors consisting of T1-control, T2-water spray ,T3-GA_3 @ 10 ppm, T4-NAA @ 10ppm , T5-SA @ 50 ppm, T6- CCC @ 50 ppm , T7- UREA @ 1% and T8- Triacontanol @ 1ml L^{-1} . These treatements were imposed by foliar spray at 35 DAS and 45 DAS .

RESULTS AND DISCUSSION

The data on seed yield (table 1) indicated that the foliar sprays significantly effected the seed yield(q ha^{-1}) and are superior over control except water spray and GA_3 @ 10 ppm . Among the two genotypes highest seed yield was found in JS-335(24.20q ha^{-1}) . In all treatments maximum seed yield was recorded with foliar application of Triacontanol @1 ml L^{-1} (24.72 q ha^{-1}) .i.e 20% more than control (20.61 q ha^{-1}) .

The data on 100 seed weight ,no.of seeds per pod (table 1) indicated that the significant differences exist due to genotypes but not with foliar sprays . Nirmal -111 recorded higher 100 seed weight (14.81 g)and no.of seeds per pod (1.84) among the two genotypes .

Shinde *et al.* (1992) observed , the foliar application of Triacontanol @2.5 ppm and soil applications of Triacontanol granules enhanced the yield from 0.42 98 % in soybean cultivar MACS-13 kelaiya *et al* . (1991) reported that the foliar spary of growth regulators like CCC (50 ppm) , NAA (40 ppm) , GA_3 (20 ppm) and Traicontanol 200 ml ha^{-1} at 25 and 30 DAS improved the test weight and yield in groundnut .

The data on no . of pods per plant percentage and seeds per plant (table 1) indicated that both genotypes and treatments caused significant differences . Among the two genotypes JS-335 produced higher no.of pods per plant (48.80) and seeds per plant (30.55) .Of all treatements Triacontanol @ mL L^{-1} recorded highest no.of pods per plant (50.67) and seeds per plant (76.92) .

The data on shelling percentage and harvest index were presented in table-2 . Significant differences were observed due to genotypes and treatments Traicntanol recorded highest harvest index (43.58) and shelling percentage (57.38) over control (41.22) and (53.67). Among the two genotypes JS-335 recoded higher harvest index (42.78) and shelling percentage (56.95) . Narasimharao *et al.* (2005) reported that the increased yield may be due to the podset in chickpea.

Table 1. Effect of foliar sprays on yield and yield components

S.No.	Treatments	Seed yield (q ha^{-1})			100 seed weight (g)		
		JS - 335	Nirmal-111	Mean	JS - 335	Nirmal-111	Mean
T1	Control	21.97	19.24	20.61	13.11	14.57	13.84
T2	Water spray	22.11	19.88	21.00	13.13	14.58	13.86
T3	$G.A_3$@10ppm	23.37	20.07	21.72	13.42	14.68	14.05
T4	NAA@10ppm	24.23	21.35	23.04	13.66	14.90	14.28
T5	SA @ 50ppm	25.99	22.13	24.06	13.81	15.06	14.44
T6	CCC @ 50ppm	24.33	20.59	22.46	13.48	14.71	14.10
T7	Urea @ 1%	24.51	20.62	22.57	13.55	14.79	14.17
T8	Triacontanol @ lml^{-1}	26.55	22.88	24.72	13.90	15.17	14.54
	Mean	24.20	20.85	-	13.51	14.81	-
		SEm+/-	CD (0.05)		SEm+/-	CD (0.05)	
	Growth regulators	0.482	1.392		NS	NS	
	Genotypes	0.241	0.696		0.162	0.469	
	Interaction	NS	NS		NS	NS	
	CV%	5.24			5.61		

Number of seeds per pod			Number of pods per plant			Number of seeds per plant		
JS - 335	Nirmal-111	Mean	JS - 335	Nirmal-111	Mean	JS - 335	Nirmal-111	Mean
1.60	1.80	1.70	47.13	32.93	40.03	75.44	59.44	67.44
1.61	1.82	1.72	47.20	33.66	40.43	75.78	61.38	68.58
1.64	1.82	1.73	47.90	33.73	40.82	78.39	61.51	69.95
1.65	1.86	1.76	49.42	34.63	42.03	81.48	64.45	72.97
1.68	1.86	1.77	50.53	35.50	43.02	84.72	66.14	75.43
1.63	1.85	1.74	48.24	34.00	41.12	81.23	63.01	72.12
1.65	1.84	1.75	49.33	36.15	42.74	81.40	62.75	72.08
1.70	1.88	1.79	50.66	50.67	50.67	85.94	67.89	76.92
1.65	1.84	-	48.80	36.41	-	80.55	63.32	-
SEm+/-	CD (0.05)		SEm+/-	CD (0.05)		SEm+/-	CD (0.05)	
NS	NS		0.781	2.254		1.477	4.265	
0.028	0.056		0.390	1.127		0.739	2.133	
NS	NS		NS	NS		NS	NS	
11.13			4.60			5.03		

Table 2. Effect of foliar sprays on yield components

S.No.	Treatments	Harvest Index (%)			Shelling Percentage (%)		
		JS - 335	Nirmal-111	Mean	JS - 335	Nirmal-111	Mean
T1	Control	42.09	40.34	41.22	54.66	52.68	53.67
T2	Water spray	42.11	41.44	41.78	54.67	52.80	53.74
T3	$G.A_3$ @10ppm	42.25	41.67	41.96	55.39	52.90	54.15
T4	NAA@10ppm	42.80	41.98	42.39	57.22	55.04	56.13
T5	SA @ 50ppm	42.29	41.76	43.03	59.90	55.33	57.62
T6	CCC @ 50ppm	44.01	42.50	43.26	57.21	54.15	55.68
T7	Urea @ 1%	42.46	41.80	42.13	57.50	54.19	55.85
T8	Triacontanol @ lml^{-1}	42.09	40.34	41.22	59.07	55.68	57.38
	Mean	42.15	41.48	-	56.95	54.10	-
		SEm+/-	CD (0.05)		SEm+/-	CD (0.05)	
	Growth regulators	NS	NS		1.013	2.928	1.013
	Genotypes	NS	NS		0.507	1.464	0.507
	Interaction	NS	NS		NS	NS	NS
	CV%	5.29			4.47		

LITERATURE CITED

Board J E 1987. Yield components related to seed yield in soybean . Crop Science 27:1296-1297.

Kelaiya V V, Jethwa M G ,Patel J C and Sadaria S G 1991. Effect of growth regulators and their spraying schedules on groundnut .Indian Journal of Agronomy 36(1) : 113-116 .

Narasimharao K L , Jayarami reddy P, Mahalakshmi B K ,and Narasimharao C L 2005. Effect of plant growth regulators and micronutrients on flower abortion ,pod setting and yield of chick pea . Annals of Plant Physiology 19(1): 14-16.

Pushpakakumri R, Nair R V and Kumari V L G 1993. Variation in the growth pattern of soybean Legume Research 16: 63-66 .

Shinde M S , Balsingh S M and Patil V A 1992. Yeild and components of soybean as influenced by foliar applications of Traicontrol (vipul) . Indian Journal of Plant Physiology 35(4):393-395.

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