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Research Article

Yield and Quality Attributes in Different Genotypes of Soybean as Affected by Basal Doses of Inputs in Black Soil

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ABSTRACT

The experiment was conducted near research farm of Krishi Vigyan Kendra Sehore, (M.P) during kharif season of 2008-09 with Genotypes (10) viz.T_1 (Bragg), T_2 (JS 93-05), T_3 (RKS 24) T_4 (NRC 37), T_5 (MOUS 158), T_6 (JS 97-62) T_7 (NRC 7), T_8 (JS 7546), T_9 (JS 9560) T_{10} (JS 335). Protein content in the seeds of soybean reflected a significant variation and the RKS 24 was found to have maximum protein content in the seeds followed by MOUS 158. JS 335 genotype was found to have maximum nutrients status in the form of NPK content and their uptake followed by the genotype Bragg under the study.

Key word: *Genotypes, Protein, Nutrient.*

INTRODUCTION

Soybean is largely used for the extraction of oil and is now considered as one of the most important economic crop of the country. The de-oiled cake left after extraction of oil is still very rich in protein content and hence, provides scope for supplementary protein dietary requirement for human being and domestic animals. It is the second most traded edible oil in the international market after palm oil. Soybean used in different forms such as soya milk, soya butter, soya flour, soya coffee, soya sauce, soya paneer (Tofu) etc. soybean can be as industrial product such as paints, printing inks, cosmetics, soap or detergents, plastic and rubber industry. It is widely used in the industrial production of different antibiotics. Soya can be used in many ways in our daily life. Regarding use of soybean imagination is the only limitation. Different soya products such as soybeans, soya flour, and soybean oil can be added to variety of traditional foods. Here are some easy tips and ways to consume soybean protein regularly.

Soybeans contain two primary isoflavones called genistein and diadzein, and a minor one called glycitein. Whole soybeans and non fermented soya foods contain primarily isoflavones in the 'glycoside' form, which means they are attached to a molecule of sugar.

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In contrast, fermented soyafoods like miso contain mostly 'aglycones', isoflavones without the sugar. Isoflavones have a very limited distribution in nature. Soybeans and soya foods contain approximately 1-3 mg of isoflavones per gram. Traditional soya foods provide about 30 mg of isoflavones per serving. Gharpinde *et al.*[5] reported that 100% RFR + 25 kg K/ha + biofertilizers gave the highest grain and straw yields (14.26 and 30.68 quintal/ha, respectively), grain and straw N contents (74.77 and 57.47 kg/ha), grain P content (9.36 kg/ha), and grain and straw K contents (10.17 and 37.33 kg/ha). Bhaskar[6] has reported the significant response of FYM @ 2.5 t ha^{-1} along with RDF, Zinc, Molybdenum and Biofertilizers on NPK uptake protein in seed and yield of soybean in clay loam soil. Shahina *et al.* indicated that the application of fertilizer N alone, N with FYM or poultry manure or urban compost, FYM alone led to a significant increase in organic C, total N, hydrolysable N (i.e., amino acid N, hydrolysable NH_4-N, hexose amine N) and non hydrolysable N in both surface and sub surface soils as compared to initial status.

RESULT AND DISCUSSION

Nitrogen content in straw varied significantly due to treatments and maximum nitrogen content in straw was recorded under treatment T_{10} (1.06%) which was significantly higher than that recorded under other treatments. The increase in N content could be due to the fair availability of N content in the experimental soil.

Various treatments showed significant difference in phosphorus content in seed. All the treatments recorded significantly higher phosphorus content in seed. Phosphorus content in straw varied significantly amongst various treatments and maximum phosphorus content in straw was recorded under T_{10} (0.36%). The increase in P content could be due to the proper mineralization of nutrients in the soil. Highest K content in seed Recorded in treatment T_{10} The variations in K content in straw were observed significant due to different treatments K content in straw was more under treatment T_{10} (2.04) and it was on par with T_6, T_3, T_8 , T_4 , T_9, T_1, T_5 and T_2 . Though the similar increase in NPK contents in soybean crop have also been reported by Mishra *et al.*[2] and Sharma[3], Bhaskar[6], Gharpinde *et al.*[5] and Konthoujam[4].

The increase in NPK content in seed and straw and seed protein of soybean genotypes could be because of the fair availability of nitrogen , phosphorus and potassium due to enhanced nitrogen fixation owing to the incorporation of *B. japonicum* and phosphorus solubilizing micro organism inoculums uniformly applied to all the genotypes under the study .The similar trend of results are in also close conformity on the result obtained under AICRP on soybean during 2006-07 in vertisol[1] and also reported by Bhaskar[6], Gharpinde *et al.*[5] and Konthoujam[4].

The critical perusal of data on NPK uptake in seed, straw and total uptake revealed that it was significantly influenced by the different genotypes under the study. The maximum NPK in seed and straw and total uptake was noticed under the genotypes JS 335 (141.33 kg/ha, 29.49 kg/ha and 170.83 kg/ha) respectively in case of N uptake followed by Bragg (152.98 kg/ha, 25.31 kg/ha and 127.67 kg/ha) respectively. The lowest N uptake was noticed under the genotypes JS 9560 (84.14 kg/ha, 17.51 kg/ha and 101.65 kg/ha), respectively in seed, straw and total uptake. The maximum P uptake was recorded under JS 335 (8.82 kg/ha, 7.27 kg/ha and 16.09 kg/ha), respectively in seed, straw and the total uptake. The minimum was noticed under NRC 7 (i.e. 5.19 kg/ha, 3.84 kg/ha and 9.04 kg/ha), respectively in seed, straw and the total uptake by soybean genotypes, while in case of K uptake the highest was noticed under JS 335 (i.e. 46.26 kg/ha, 35.25 kg/ha and 81.51 kg/ha), respectively in seed, straw and the total uptake by soybean. The lowest K uptake was noted to be in JS 9560 (i.e. 24.64 kg/ha, 23.99 kg/ha and 48.63 kg/ha), respectively in seed, straw and the total uptake by the soybean. The enhancement in NPK contents and their uptake could be visualized due to the accelerated N, P, K, content and their fair availability in the

experimental soil and thus, enhanced soybean growth and its seed yield resulted due to better rhizospheric conditions enhanced by the incorporation of microbial inoculums and hence such response of increased NPK uptake by different genotypes of soybean under the study. Though the similar increased in NPK contents and their uptake by soybean crop have also been reported by Mishra *et al.*[2] and Sharma[3], Bhaskar[6], Gharpinde *et al.*[5] and Konthoujam[4].

Effect of different treatment on N, P & K content in seed and straw

	Genotypes	N Content		P Content		K Content	
		Seed	Straw	Seed	Straw	Seed	Straw
T_1	Bragg.	6.30	1.00	0.33	0.18	1.87	1.17
T_2	JS-9305	6.29	0.98	0.30	0.15	1.82	1.13
T_3	RKS-24	6.40	1.01	0.30	0.17	1.87	1.21
T_4	NRC-37	6.31	1.01	0.33	0.17	1.88	1.19
T_5	MOUS-158	6.26	0.99	0.30	0.16	1.87	1.16
T_6	JS-9752	6.32	0.98	0.33	0.19	1.93	1.24
T_7	NRC-7	6.27	0.95	0.30	0.17	1.81	1.21
T_8	JS-7546	6.34	0.96	0.32	0.18	1.87	1.20
T_9	JS-9560	6.28	0.92	0.33	0.18	1.78	1.18
T_{10}	JS-335	6.39	1.06	0.36	0.25	2.04	1.32
	SEm±	0.01	0.02	0.01	0.01	0.02	0.02
	CD at 5%	0.04	0.06	0.03	0.03	0.05	0.05

Effect of different treatment on N, P & K uptake (seed and straw, kg/ha)

	Genotypes	N Uptake			P Uptake			K Uptake		
		Seed	Straw	Total	Seed	Straw	Total	Seed	Straw	Total
T_1	Bragg.	127.67	25.31	152.98	7.54	5.06	12.60	38.06	28.20	67.26
T_2	JS-9305	94.22	20.13	114.35	5.40	3.66	9.06	28.35	23.46	51.81
T_3	RKS-24	111.18	22.58	133.76	6.00	4.40	10.07	34.15	25.93	60.07
T_4	NRC-37	113.93	22.74	136.67	6.78	4.31	11.10	34.34	25.48	59.82
T_5	MOUS-158	103.55	21.39	125.18	5.81	4.04	9.84	31.90	24.60	56.50
T_6	JS-9752	119.48	23.92	143.40	7.03	4.92	11.95	37.54	28.77	66.64
T_7	NRC-7	90.43	19.09	109.52	5.19	3.84	9.04	27.11	22.81	49.92
T_8	JS-7546	118.46	23.68	142.13	6.91	4.80	11.70	36.09	28.17	64.26
T_9	JS-9560	84.14	17.51	101.65	5.21	3.94	9.15	24.64	23.99	48.63
T_{10}	JS-335	141.33	29.49	170.83	8.82	7.27	16.09	46.26	35.25	81.51
	SEm±	3.55	0.88	4.24	0.27	0.24	0.40	1.06	1.44	1.58
	CD at 5%	10.26	2.55	12.25	0.80	0.70	1.17	3.06	2.15	4.58

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