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RESEARCH ARTICLE

RESPONSE OF GROWTH REGULATOR TO GROUNDNUT IN CHARLAND AREA

Jubaidur Rahman*[a], Mukaddasul Islam Riad[b]

[a] Scientific Officer, Agronomy Division, Bangladesh Agricultural Research Institute, Jamalpur-2000, Bangladesh
[b] Scientific Officer, Plant Genetic Resources Centre, Bangladesh Agricultural Research Institute, Jamalpur-2000, Bangladesh
**Corresponding Author Email: jubaidurjp@gmail.com*

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ABSTRACT

The experiment was conducted at the charland area of Jamalpur during rabi 2017-18 and 2018-19 to find out the suitable growth regulator for groundnut in char land. Treatments included in the experiment were: Flora (Nitrobenzene, ACI), Nafa (Entefa), Maxsulphar (Sulfer-80%, Mcdonald), Alba (Avamectin-1.8 EC, SAMP Limited), Calsol and Control (without growth regulator). Growth regulator were applied Flora (2 ml/L), Nafa (2.5 ml/L), Maxsulphar (2 ml/L), Alba (0.5 ml/L), Calsol (3 ml/L) as foliar spray at 35 and 45 days after sowing (DAS). Several yield parameters e.g. plant height, number of pod/plant, number of effective pod/plant, number of uneffective pod/plant, root length, 100 seed wt. and yield were analyzed. Growth regulators effective to groundnut in charland area from Flora, Nafa, Maxsulphar and Alba application due to formation of nodulation, chlorophyll synthesis and supply of plant growth agent. Control treatment performs better than some growth regulator treatments.

KEYWORDS

Growth regulator, groundnut, charland area.

1. INTRODUCTION

Groundnut (*Arachis hypogaea* L.) is an important leguminous oilseed crop which is commonly known as poor man's nut as it is a cheaper source of protein when comparable to other nuts like cashew nut. It is also called as peanut, monkey nut and goober nut. Groundnut seed contains 44 to 56% oil and 22 to 30% protein on dry seed basis and is a rich wellspring of minerals (Phosphorus, Calcium, Magnesium and Potassium) and vitamins (Kaba et al., 2014). In Bangladesh, there are about 0.82 million hectares of char land (Ahmed et al., 1987). "Charland" is the Bengali term, its English meaning is "Riverine Island" for mid-channel island that emerges periodically from riverbed as a consequence of accretion (Elahi, 1991). In Bangladesh the *char* lands can be divided into five sub areas which has highly potential for groundnut production (The Jamuna, the Ganges, The Padma, The upper Meghna and the lower Meghna River) where Tista and old Brahmaputra also constitute some *char* land areas (Islam et al., 2012).

The major char inhabited districts of Bangladesh are Jamalpur, Sirajgonj, Noakhali, Bogra, Rangpur and Mymensingh. Plant growth regulators are known to enhance the yield, oil and fatty acids content in peanut (Malik et al., 1993). Groundnut is the most important oil crop in area and production in Bangladesh especially in char land areas. Jamalpur district which most groundnut production area of Bangladesh 1387 acres area produced 1314 MT (BBS, 2016). Farmers of charland area of Jamalpur district applied plant growth regulators which locally named vitamins. They used different vitamins in different companies for increasing yield of groundnut. Just the farmers of charland area foliar spray of plant growth regulators to get healthy and high yielding plant. But they do not know main activities of plant growth regulators. In this case the experiment is undertaken to find out suitable growth regulator locally named Vitamins for groundnut in charland.

2. METHODS AND MATERIALS

The district lies between 24°34′ and 25°26′ north latitudes and between 89°40′ and 90°12′ east longitudes and it is situated at elevation 23 meters above sea level (Pal, 2012). The annual average temperature of this district varies from maximum 36.63°C to minimum 9.4°C. Annual average rainfall is 933.7 mm (Regional Research Report, 2018-19). The experimental site was of medium high land belonging to the agro-ecological zone Old Brahmaputra Floodplain under Agro-Ecological Zone 9 (UNDP-FAO, 1988). The experiment was conducted at the charland area of Jamalpur during rabi 2017-18 and 2018-19 to find out the suitable growth regulator for groundnut in char land. Design of the experiment was RCB with 3 replications. Each treatment was sown in unit plot having 5m × 3m with the spacing of 15 × 30 cm. Spacing between two plots and replications were 1m and 1m respectively.

BARI Badam-8 was used as a check variety in the experiment. Treatments included in the experiment were: Flora (Nitrobenzene, ACI), Nafa (Entefa), Maxsulphar (Sulfer-80%, Mcdonald), Alba (Avamectin-1.8 EC, SAMP Limited), Calsol and Control (without growth regulator). Growth regulator were applied Flora (2 ml/L), Nafa (2.5 ml/L), Maxsulphar (2 ml/L), Alba (0.5 ml/L), Calsol (3 ml/L) as foliar spray at 35 and 45 days after sowing (DAS). Fertilizers were applied at the rate of 25-160-85-300-10 kg/ha NPKSB (FRG, 2012) as urea, triple super phosphate (TSP), muriate of potash (MOP), gypsum, Boron. Seeds were sown on November 16, 2017 and November 08, 2018 in rows. Weeding was done at 20 days after emergence of the crop. Grain yield was calculated from the whole plot. Yield contributing characters were taken from 05 randomly selected plants from the middle rows of each plot. Data were analyzed with the help of a computer package program STAR and means were separated following LSD test at 5% level of significance.

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3. Results and Discussion

Yield and yield components like plant height, number of pod per plant, number of effective pod per plant, number of uneffective pod per plant and yield differed significantly influenced by growth regulator. The highest plant height was found in application of Alba Y_1 (39.2 cm) containing avamectin which good performance against mites because groundnut field attacked by mites and in Y_2 highest performed by Nafa (48.1cm) and lowest (35.9cm) from control treatment (Ministry of Water resources, 2004). Highest pod per plant was found Y_1 and Y_2 from Nafa and lowest from control treatment. Number of effective pod per plant was found Y_1 from Maxsulphar (21.07) Y_2 from Nafa (24) due to formation of nodulation and chlorophyll synthesis and lowest from control treatment. Number of uneffective pod per plant lowest Y_1 from Maxsulphar, Y_2 from Nafa because of maximum effective pod per plant and lowest calsol both the year. Highest root length was found Y_1 from Nafa (12.72cm), Y_2 from Flora (18.2 cm) and lowest from Y_1 Calsol (11.71 cm), Y_2 control (14.4 cm) (Nickell, 1982). 100 seed weight was highest Y_1 from Alba (41.76 gm), Y_2 from calsol (55 gm) due to supply of plant growth agent. Highest yield was found Y_1 from Nafa (2.45 t/ha), Y_2 from Flora (2.69 t/ha) may be cause of supply to plant growth agent and management (Rahman *et al.,* 2015).

Table 1: Yield and yield components of growth regulator to groundnut in charland area (Jamalpur 2017-18 and 2018-19)

Treatment	Plant height(cm)		No.of pod/ plant		No.of effective pod/plant		No.of uneffective pod/plant		Root length(cm)		100 seed weight(gm)		Yield (t/ha)	
	Y_1	Y_2	Y_1	Y_2	Y_1	Y_2	Y_1	Y_2	Y_1	Y_2	Y_1	Y_2	Y_1	Y_2
Flora	28.6	43.2	20.93	23	18.87	22	3.1	0.9	12.09	18.2	37.56	45.2	1.87	2.69
Nafa	33.73	48.1	20.4	26	17.27	24	3.6	1.9	12.72	16.9	39.89	54.2	2.45	1.93
Maxsulphar	35.87	44.2	22.8	24	21.07	23	2.47	1.5	12.41	17	37.65	50	2.42	2.16
Alba	39.2	42.2	21.47	23	17.47	21	4.2	1.5	11.82	16	41.76	53	2.13	2.32
Calsol	30.93	43.9	20.87	22	18	21	6.6	0.8	11.71	16.2	37.96	55	2.17	2.56
Control	32.6	35.9	23.87	13	17.07	12	5.13	1.2	12.03	14.4	37.96	54	2.25	2.18
$LSD_{0.05}$	7.38	8.5	-	11	-	4.9	2.0	-	-	-	-	-	0.14	2.2
CV (%)	7.77	6.99	9.43	10.2	10.6	11.2	16.95	18	3.24	11	11.54	15	2.2	5

Y_1= 2017-18 and Y_2= 2018-19

4. Conclusion

Application of growth regulator to groundnut in charland area effective by Flora, Nafa, Maxsulphar and Alba application due to formation of nodulation, chlorophyll synthesis and supply of plant growth agent. Control treatment performs better against some growth regulator treatments.

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