

# **PRODUCT TESTING REPORT ON**

**FIELD TEST FOR PLANT GROWTH REGULATOR  
(GMX GREEN PRO MAX) ON SOYBEAN PRODUCTION**

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**509, Balrama, Bandrakula Complex, Bandra East, Mumbai – 400051**

## **Investigators :**

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**Dr. S.K.Mishra, Scientist**

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GARHAKOTA, DISTRICT – SAGAR ( M.P.)**

## Report on Field Test for Plant Growth Regulator on Soybean Production

S. No.	Title	:	Details
1.	Title	:	<b>Field Test for Plant Growth Regulator (GMX Green Pro Max) on Soybean Production</b>
2.	Objectives	:	(1) To evaluate the effect of GMX Green Pro Max on Physiological development of Soybean Crop.  (2) To evaluate yield potential of soybean crop treated with GMX Green Pro Max under field conditions
3.	Sponsoring Agency	:	<b>M/s Ritika Research Labs Pvt. Ltd., 509 Balrama, Bandrakurla Complex, Bandra East, Mumbai – 400051</b>
4.	Name & Address of the Investigator & Institute	:	(1) <b>Dr. Vikas Gupta</b> , Scientist, Horticulture Vocational Education Institute, DHRTC, Garhakota , District-Sagar (2) <b>Dr. S.K.Mishra</b> , Scientist, Horticulture Vocational Education Institute, DHRTC, Garhakota, District - Sagar ( M.P.)
5.	Location	:	DHRTC Farm, Garhakota, District-Sagar (M.P.)
6.	Design with Replication	:	Randomized Block Design with three replications
7.	Treatments	:	Eight treatments
8.	Variety:	:	JS-93-05
9.	Net Plot Size:	:	4.5 x 3.60 m <sup>2</sup>
10.	Date of Sowing:	:	07 <sup>th</sup> July, 2015
11.	Date of Harvesting	:	14/10/2015
12.	Meteorological Data Recorded	:	Temp. (maximum & minimum), Relative Humidity (maximum and minimum) and Rainfall

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### 13. Treatment Details:

Treatment No.	Treatment Detail
T <sub>1</sub>	Regular Cultural Practices (RCP)
T <sub>2</sub>	RCP + Foliar Application 1
T <sub>3</sub>	RCP + Foliar Application 2
T <sub>4</sub>	RCP + Foliar Application 1 + Foliar Application 2
T <sub>5</sub>	RCP + Seed Treatment + Foliar Application 1
T <sub>6</sub>	RCP + Seed Treatment + Foliar Application 2
T <sub>7</sub>	RCP + Seed Treatment + Foliar Application 1 + Foliar Application 2
T <sub>8</sub>	RCP + Seed Treatment + Foliar Application 1 + Foliar Application 2 – 20% Fertilizer

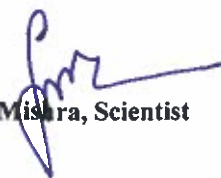
### 14. Methodology: Observation were recorded on following parameters.

- (1) **Germination percentage** : The germination was recorded from each plot in terms of percentage.
- (2) **Plant height** : Five plants from each plot were tagged randomly at initial stage for recording of the plant height at 30 DAS, flowering and fruiting stage. The height was measured in c.m. from the base of the plant to fully open leaf tip.
- (3) **Primary branches per plant** : Number of primary branches were counted from five plants from each plot already tagged and average number of primary branches/ plant was worked out.
- (4) **Length of root at 10 DAS & at flowering stage** : Length of root were measured from five plants from each plot at 10 DAS & five plants at flowering stage from each plot already tagged.
- (5) **Root dry weight at 10 DAS & at flowering stage** : The root dry wt. were recorded at 10 DAS & at flowering stage by taking five plants randomly selected from each plot. The root sample taken were placed separately in perforated paper bags & sun dried for two-three days and finally kept in oven at 80° C till a constant weight was obtained.
- (6) **Seed Yield** : Seed yield from each net plot area was weighed and converted in qt. / ha. after threshing and winnowing.

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(7) **Pods per plant** : Fully matured develop pods from randomly selected five plants from each plot were plucked and counted. The average number of pods / plant was worked out.

(8) **Seeds per pod** : Seeds collected from five pods from randomly selected plants were threshed and total no. of seeds was counted.

## 15. Observations:

### I. PHYSIOLOGICAL PARAMETERS:

**Germination Percentage:** The data presented in **Table 1** indicated that maximum germination percentage (82%) was recorded in application of RCP + Seed treatment + Foliar application 1 + Foliar application 2 and found significantly superior over rest of the treatments but statistically at par with the T<sub>5</sub>, T<sub>6</sub> and T<sub>8</sub> treatments.

**Plant Height at 30 DAS:** The maximum plant height (26.58 cm) was recorded in treatment of RCP + Seed treatment + Foliar application 1 + Foliar application 2 (T<sub>7</sub>) was found significantly superior over all other treatments at 30 DAS.

**Plant Height at Flowering Stage:** The maximum plant height (39.82 cm) was recorded in treatment of RCP + Seed treatment + Foliar application 1 + Foliar application 2 (T<sub>7</sub>) was found significantly superior over all other treatments at Flowering Stage (**Table 1**).

**Plant Height at Fruiting Stage:** The data in **Table 1** revealed that plant height at Fruiting stage significantly increased by the treatment comprises of application of RCP + Seed treatment + Foliar application 1 + Foliar application 2 (39.82 cm) found significantly superior over all other treatments.


**Primary branches per Plant at flowering** : The data presented in **Table 1** indicated that the maximum number of branches per plant (6.58) at flowering stage was observed in treatment of RCP + Seed treatment + Foliar application 1 + Foliar application 2 (T<sub>7</sub>) which was significantly superior over rest of the treatments but statistically at par with treatment of RCP + Seed Treatment + Foliar Application 1 + Foliar Application 2 – 20% Fertilizer (T<sub>8</sub>)

**Length of Root at 10 DAS:** The treatment of RCP + Seed treatment + Foliar application 1 + Foliar application 2 (T<sub>7</sub>) provided maximum length of root (11.34 cm) was significantly superior over all other treatments at 10 DAS but statistically at par with the treatment of RCP + Seed treatment + Foliar application 1(T<sub>5</sub>) (**Table 1**).

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## **VEGETATIVE GROWTH OF SOYBEAN CROP**



## **REPRODUCTIVE GROWTH OF SOYBEAN CROP**



**Length of Root at Flowering Stage:** It is observed that length of root at flowering not significantly affected by the different treatments of Green Pro Max but found significantly superior over control (11.23 cm) (Table1).

**Root Dry weight at Transplanting:** The data presented in Table 1 revealed that the maximum root dry weight (0.124 mg ) was recorded from the treatment of RCP + Seed treatment + Foliar application 1 + Foliar application 2 at 10 DAS and found significantly superior over T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> treatments.

**Root Dry weight at Flowering Stage:** It is found that there is no significant difference in between the treatments of Green Pro Max application in respect of root dry weight at flowering stage in Soybean (Table 1).

## II. REPRODUCTIVE PARAMETERS AND YIELD:

**Number of Pods Plant:** The treatment comprises of application of RCP + Seed treatment + Foliar application 1 + Foliar application 2 recorded maximum number of Pods per Plant (16.20 pods/plant) and found significantly superior over all other treatments (Table 2).

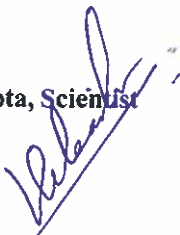
**Number of Seeds per Pod:** The Table-2 revealed that the maximum number of seeds per pod (3.09 Seeds per pod) was recorded in treatment of RCP + Seed treatment + Foliar application 1 + Foliar application 2 ( T<sub>7</sub> ) which was significantly superior over the rest of the treatments but statistically at par with treatment T<sub>8</sub> which provided 3.06 seeds per pod.

**Seed Yield per Plot:** The data presented in Table-2 indicated that maximum seed yield per plot (262.44 g/plot) was recorded in treatment of RCP + Seed treatment + Foliar application 1 + Foliar application 2 which was significantly superior over T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>5</sub> treatments and statistically at par with the rest of the treatments (Table 2).

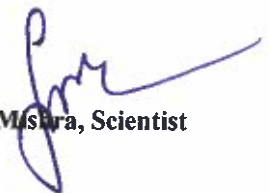
**Seed Yield per Hectare:** The Table 2 indicated that the highest seed yield (1.62 q/ha) was recorded in the plots treated with treatment of RCP + Seed treatment + Foliar application 1 + Foliar application 2 (T<sub>8</sub>) and was found significantly superior over the treatments T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> & T<sub>5</sub> and statistically at par with T<sub>4</sub>, T<sub>6</sub> and T<sub>8</sub> treatments. The minimum seed yield (1.49 q/ha) was observed in control plot (T<sub>8</sub>).

**NOTE :** Due to intensive attack of Yellow mosaic virus ( YMV ) scanty and irregular rainfall and high temperature. during reproductive phase resulting in to less no. of seeds / pod, reduction in seed size, less no. of pods / plant and ultimately reduced seed yield drastically. Moreover, in the Garhakota area the average seed yield was obtained 1.20 qt./ha due to same reasons.

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15. **Meteorological data during the experimental period:** Meteorological data during the experiment period was recorded and the same is attached as **Table-3**.

**Conclusions:** In view of the above findings, it is concluded that;

(1) The application of GMX Green Pro Max a plant growth regulator applied in treatment T<sub>8</sub> including RCP + Seed Treatment + Foliar Application 1 + Foliar Application 2 is effective among all the treatments and has positive effect on physiological development of soybean crop .

(2) The GMX Green Pro Max comprises of RCP + Seed Treatment + Foliar Application 1 + Foliar Application 2 (T<sub>8</sub>) increases the seed yield of soybean crop over all other treatments.

  
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**Table 1 : Effect of GMX Green Pro Max on Growth Parameters of Soybean Crop during Kharif season, 2015 at DHRTC Farm, Garhakota, Sagar (MP).**

Treatment No.	Germination (%)	Length of root at 10 DAS (cm)	Length of root at Flowering (cm)	Root Dry weight at 10 DAS (cm)	Root Dry weight at Flowering (cm)	Plant Height at 30 DAS (cm)	Plant Height at Flowering Stage (cm)	Plant Height at Fruiting Stage (cm)	No. of Primary Branches/ Plant at Flowering
T <sub>1</sub>	76	10.90	11.23	0.119	0.122	19.53	31.73	31.76	3.68
T <sub>2</sub>	76	10.90	11.62	0.119	0.127	25.32	37.39	37.46	5.17
T <sub>3</sub>	77	10.91	11.58	0.119	0.126	19.78	33.01	33.12	4.06
T <sub>4</sub>	77	10.93	11.68	0.123	0.127	25.40	37.61	37.74	5.26
T <sub>5</sub>	81	11.31	11.70	0.123	0.127	25.62	38.14	38.23	6.21
T <sub>6</sub>	81	11.30	11.64	0.123	0.127	24.42	37.09	37.19	5.04
T <sub>7</sub>	82	11.34	11.75	0.124	0.128	26.58	39.82	39.94	6.58
T <sub>8</sub>	80	11.29	11.73	0.123	0.128	26.12	38.43	38.49	6.49
<b>CD</b>	3.513	0.034	0.236	0.003	NA	0.098	0.064	0.431	0.249
<b>SEm ±</b>	1.147	0.011	0.077	0.001	0.001	0.032	0.021	0.141	0.081

  
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**Table 2 : Effect of GMX Green Pro Max on Yield and Reproductive Parameters of Soybean Crop during Kharif Season, 2015 at DHRTC Farm, Garhakota, Sagar (MP).**

Treatment No.	Treatment Detail	No. of Pods per Plant	No. of Seeds per Pod	Seed Yield per Plot (g)	Seed Yield (q/ha)
T <sub>1</sub>	Regular Cultural Practices (RCP)	14.65	2.84	241.38	1.49
T <sub>2</sub>	RCP + Foliar Application 1	14.97	2.87	244.62	1.51
T <sub>3</sub>	RCP + Foliar Application 2	15.29	2.91	247.86	1.53
T <sub>4</sub>	RCP + Foliar Application 1 + Foliar Application 2	15.56	2.96	254.34	1.57
T <sub>5</sub>	RCP + Seed Treatment + Foliar Application 1	15.34	2.95	251.10	1.55
T <sub>6</sub>	RCP + Seed Treatment + Foliar Application 2	15.98	2.98	255.96	1.58
T <sub>7</sub>	RCP + Seed Treatment + Foliar Application 1 + Foliar Application 2	16.20	3.09	262.44	1.62
T <sub>8</sub>	RCP + Seed Treatment + Foliar Application 1 + Foliar Application 2 – 20% Fertilizer	16.04	3.06	257.58	1.59
<b>CD</b>		0.076	0.055	10.10	0.062
<b>SEM±</b>		0.025	0.018	3.298	0.020

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**Table-3: Meteorological data at Sagar district during Kharif Season July to Nov. 2015**

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)
	Max.	Min.	Morning	Evening	
08 to 14 July, 2015	31.01	23.85	88.28	84.28	11.07
15 to 21 July, 2015	30.61	23.95	77.57	85.85	53.42
22 to 28 July, 2015	28.10	22.68	94.00	86.00	11.81
29 July to 04 August, 2015	28.62	22.80	102.71	91.14	7.13
05 to 11 August, 2015	30.05	22.85	93.85	85.14	14.02
12 to 18 August, 2015	29.73	23.30	85.00	89.57	11.95
19 to 25 August, 2015	30.22	22.27	89.85	69.85	13.31
26 August to 01 September, 2015	31.07	22.71	92.14	81.28	5.02
02 to 08 September, 2015	31.94	22.68	71.42	66.71	0.25
09 to 15 September, 2015	34.57	22.90	74.85	57.28	0.02
16 to 22 September, 2015	32.52	23.74	83.71	62.57	0
23 to 29 September, 2015	33.61	18.58	74.01	46.42	0
30 September to 06 October, 2015	36.20	22.18	51.71	37.71	8.59
07 to 13 October, 2015	32.07	20.60	52.14	35.28	0.04
14 to 20 October, 2015	35.88	22.40	48.85	35.71	22.55
21 to 27 October, 2015	33.68	22.00	60.85	44.14	0.11
28 October to 03 November, 2015	29.33	13.85	75.43	61.87	0
04 to 10 November, 2015	32.82	20.01	64.14	51.57	0
11 to 17 November, 2015	32.85	18.92	56.71	45.32	0
18 to 24 November, 2015	30.17	16.87	53.22	42.88	0

  
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