ISSN: 2278-4632
Vol-10 Issue-6 No. 15 June 2020

EFFECTS OF DIFFERENT GROWTH REGULATORS NAA & KI ON *VIGNA MUNGO* LINN.

P. O. Pandey*, M. K. Deshattiwar and Remi V. R.
Post Graduate dept. of Botany, M. J. (autonomous) College, Jalgaon
Maharashtra, India
*Corresponding author: pandeypooja610@gmail.com

Abstract:

The present study deals with the experiment conducted on black gram(*Vigna mungo* Linn.) which is a widely grown legume belonging to the family Fabaceae. The study aimsto determine good yeilding and quality plants suitable for the climatic situations of Maharashtra. For this, the seeds of black gram are treated with the different concentrations of growth regulators NAA & KI as 25%, 50%, 75% & 100% and potted. The treated plants were observed together with the controlled plant. Various morphologicaltraits like first pair of cotyledons, number of leaf,leaf size, number of flowers, fruit set, seed weight etc. were observed and recorded. These are further compared with controlled plant. 100% NAA & 75% KI concentrations are proved to be the best yeild giving growth regulators in all aspects. Photographs of plants at various stages of growth are also taken. Maximum plant growth is achieved in 100% NAA and in 75% KI. Highest number of flowers were developed on 100% NAA and on 75% KI. Fruit set also occure earlier in 100% NAA and in 75% KI. Thus, desirable vegetative as well as reproductive responses to the 100% NAA and 75% KI were observed in potted plants.

Keywords: Black gram, Growth regulators, Yeild, Fabaceae

Introduction:

" Black gram (*Vigna mungo* Linn.)" is a widely grown grain legume which belongs to the Family *Phaseolus* (*Fabaceae*). Black gram originated in India, where it has been in cultivation from ancient times and it is one of the most highly prized pulses of India and Pakistan. It is an erect, sub erect or trailing, densely hairy, annual herb. The leaves are pinnate, divided into 3 leaflets. The inflorescence is a raceme of yellow pea flowers. The tap root produces a branched root system with smooth, rounded nodules. The pods are narrow, cylindrical and up to six cm long.

Nutritional Value:

ISSN: 2278-4632
Vol-10 Issue-6 No. 15 June 2020

Black gram is very nutritious as it contains high levels of Protein (25g/100g), Potassium (983 mg/100g), Calcium (138 mg/100 g), Iron (7.57 mg/ 100 g), Niacin (1.447 mg/ 100 g), Thiamine (0.273 mg/ 100g) and Riboflavin (0.254 mg/ 100g).

Uses :

It is mainly used as a food in all parts of India. The main dishes prepared by black gram are papad, idaly, dhosa, vada etc. Black gram is basically a health booster. It helps in improving the immune system that would help to fight many infections caused by virus, bacteria, parasites, etc. It is a beneficial herb for the Nervous System. It makes the skin fairer and smooth. Consuming black gram directly or as a mask is good for hair growth. It helps in retaining a healthy digestive system. It helps in reducing cholesterol level, which in turn, maintains the sugar level in the blood and counters diabetes.

Reasons to make this study:

India is the largest producer as well as consumer of black gram. The productivity of pulse crops in our country, including black gram is not sufficient enough to meet the domestic demands of the population. Hence, there is need for enhancement of the productivity of black gram by proper agronomic practices. Recently the market rate for black gram went very high as ever seen in the history which even made the papad makers of Kerala and other states compelled to go on strikes. Considering all these situations this study is made to know **will the application of growth regulators play any role in the good yielding of the crop?**Therefore, present study was conducted to study the effects of plant growth regulators NAA and Kinetin (KI) as foliar applications on growth attributes and yields of black gram.The Comparison between the both NAA and KI is under taken in different concentration.

Materials and Methods:

For this study the good quality seeds of black gram was collected from the market and treated with growth regulators NAA & KI of concentrations 100%,75%,50%, & 25% and grown in different pots of normal size along with the controlled plant. The treated plants are observed for various morphological traits. These are recorded and compared with normal plant.

Results and Discussions:

The growth regulators selected for this study were NAA and KI. The growth of seeds treated in different concentrations (25%, 50%, 75% & 100%) of both growth regulators apart

ISSN: 2278-4632
Vol-10 Issue-6 No. 15 June 2020

from the controlled plant was observed from the time of germination and to the time of plant death.

Germination percent:

The results presented in table – 1 showed that priming with growth regulator NAA and KI significantly increased the germination percentage at initial stage. All concentrations of NAA and 75% KI is giving the better result.

First and second pair of leaflets:

Itis revealed from table-1 that the maximum germination energy was observed by first and the second pairs of leaflets growth were faster in all NAA concentrations.

Plant height:

The data given in table-1 revealed that plant height was increased maximum and significantly by KI at 75% dose. It attained 27 cm length within 30 days time. Effect of different concentration of NAA i.e. 50%,75% and 100% doses had shown nearly 25 cm length, as compared to the other doses and control.

Flowering:

The plant treated with 75% KI have given the highest number of flowers, it was about 29 in number. Among the plants of NAA treated concentrations, 100% dose had given the more number of flowers and it is about 18.

Fruit set:

The flowers started to set as fruits within 49 days in the concentrations of NAA 75% and 100%. While the controlled gram and gram treated with KI 75% took almost 50 days time to set as fruit.

Number of seed per pod:

The results concerning number of seeds per pod in all doses of growth regulator in black gram is presented in table-1.

It is almost constant in NAA and KI treated plant and is similar with control. However, 25%, 100% doses of KI, 50%, 75% doses of NAA had shown little less number of seeds as compared to other.

Seed weight:

The data given in table-1 revealed that the 100% concentration of NAA and 75% KI had shown significant impact for inducing better seed weight; it is 0.38gm and 0.37gm

ISSN: 2278-4632
Vol-10 Issue-6 No. 15 June 2020

respectively. Considerable seed weight was noticed at all the doses of NAA and KI better than the control.

Conclusion:

The findings of present study indicate the role of proper concentrations of growth regulator. Hence, from above study it may be suggested that for the growth of Black gram 100% concentration of growth regulator NAA and 75% concentration of KI gave better results in all morphological traits and hence it is most suitable for improving the yield of crop.

References:

1. A. Amarender Reddy, MCS Bantilan and Geetha Mohan, May 2013. Pulses production scenario: Policy and Technological Options, *ICRISAT Research program, Markets, Institutions and policies.*
2. Menon PV and Kurup PA, 1974. Hypolipidemic action of the polysaccharide from *Phaseolus mungo*(black gram). Effect on glycosaminoglycans, lipids and lipoprotein lipase activity in normal rats, *Atherosclerosis,* 19, 315.
3. Nagasubramaniam, A., Pathmanabhan, G. and Mallika, V., 2007. Studies on improving production potential of body corn with foluar spray of plant growth regulators, *Annual Review of Plant Physiology*, 21, 154- 157.
4. Salisbury, E. T., 1927. On the causes and ecological significance of stomatal frequency, with special reference to the wood land flora., *Philos. Trans. R. Soc. London.B* 216, 1-65.

ISSN: 2278-4632
Vol-10 Issue-6 No. 15 June 2020

Observation Table – I(Showing Different Morphological Parameters)

Sr. No.	**Morphological traits**	NAA				KI				Control
		25%	**50%**	**75%**	**100%**	**25%**	**50%**	**75%**	**100%**	
1	Days to 50% germination	**2**	**2**	**2**	**2**	**6**	**2**	**2**	**2**	2
2	Development of Cotyledon in days	**3**	**3**	**3**	**3**	**8**	4	**3**	4	4
3	No. of leaflets (2)	**4**	**4**	**4**	**4**	**10**	5	**4**	5	5
4	No. of leaflets (4)	7	6	6	6	**12**	**7**	**7**	**7**	8
5	No. of leaflets (6)	**10**	**9**	**9**	**9**	**15**	**9**	**9**	**9**	11
6	Height of plant in 15 days (in cm)	**11**	12	**13**	**13**	**7**	11	**15**	12	9
7	Height of plant in 30 days	**23**	25	25	**25**	**13**	21	**27**	24	20
8	No. of Branches	6	6	**7**	**7**	**2**	5	6	**7**	5
9	width of stem after 30 days(in cm)	**1.9**	2	**2.2**	**2.2**	**1**	2.1	**2.4**	2.3	2.1
10	Mature leaf size	**6x4**	**7x4**	**7x4**	**7x4**	**3x4**	6x4	**7x4**	6x4	5x4
11	Days of flowering	**48**	47	**45**	**45**	**54**	50	**48**	49	**48**
12	Days of fruit setting	**52**	51	**49**	**49**	**56**	52	**50**	51	**50**
13	No. of flowers	**13**	15	16	**18**	**6**	23	**29**	20	12
14	No. of fruits	**7**	**7**	9	**12**	**3**	12	**14**	13	9
15	No. of seed per pod	**6**	5	5	**6**	5	6	**6**	5	6
16	Weight of seed	0.314g	0.293g	0.275g	0.389g	0.189g	0.279g	0.378g	0.321g	0.295g

ISSN: 2278-4632
Vol-10 Issue-6 No. 15 June 2020

Photo plate - I

Photo graphs of *Vigna mungo* Linn. Grown in different concentrations of KI

Photo plate - II

Photo graphs of *Vigna mungo* Linn. Grown in different concentrations of NAA