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Effect of Nipping on Growth and Yield of Chickpea (*Cicer Aritinum* L.) Under Dryland Condition

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ABSTRACT

A field experiment was conducted during the Rabi season (2014 and 2015) to improve the yield of chickpea by nipping with modified shear. The research on effect of nipping by modified shear at 35DAS and 45 DAS in chickpea (*Cicer aritinum* L.) was carried out in ten farmer's field in 2 block of Godda District (Jharkhand). Total three treatments and ten replications were laid out in randomized block design. Out of three treatments, nipping at 35DAS by modified shear give the best result in growth and yield attributes. Nipping at 35 DAS were superior then 45DAS (T_2) and control (no nipping) (T_3). Control treatment and nipping at 45DAS give inferior result in all aspect except plant height, significantly radiation in plant height was observed in nipped plots then control plot (without nipped plot).

Keywards: Gram, nipping, modified shear.

INTRODUCTION

Chickpea (*Cicer aritinum*) is the second most important pulse crop after pigeon pea in the world for human diet and other use. Chickpea is the important winter season pulse crop in India grown as a dry pulse crop or as a green vegetable with the farmer use being most common. It is cultivated in the area of 95.45 million hectare with production of 90.75 million hectare and average productivity of 951 kg/hectare (Govt. of India, Ministry of Agriculture and Welfare 2015). India is the largest producer of chickpea in the world. It is grown in the state of Madhya Pradesh, Utter Pradesh, Rajasthan, Maharastra, Gujrat, Andra Pradesh, Karnataka and Jharkhand sharing over 95 per cent area in India.

Jharkhand state has good agro-ecological situation for chickpea production. It is grown over on area of 10.32 million hectare, with an annual production of 9.88 million hectare and average productivity of 967 kg/hectare (Anonymous 2013). There are so many factors responsible for low productivity of chickpea crop in Jharkhand like low rainfall, high temperature, low nutrients availability of soils, sowing methods and proper spacing and nipping among them nipping is the one of the most important factors related to low productivity of chickpea. It is well known that physiological manipulations may influences the plant source to sink relationship ultimately yield. Nipping at various stages by plant and mechanical methods tended to enhance numbers of branches per plant, numbers of pods, numbers of grains per pods and grains that boost chickpea yield (Bloch *et. al.,* 2010). Nipping practice in the area of Jharkhand has two fold advantages. On the one man mechanical nipping by modified share at prescribed growth stages could improve yield of the crop while on the other hand during time of chickpea in the field may provide green saag to farmer and green fodder for their livestock. Khan and Latif (2006) reported that chickpea nipping 35 days after sowing increased yield as well as controlled disease severity. Aslam *et. al.* (2008) witnessed on increased in height and numbers of pods

bearing branches with respect to nipping as chickpea at various level under dry land condition.

Chickpea is one of the most important crops at national and international level, very little work has been undertaken to study the subject. Therefore lacking to the above facts, the present investigation entitled "Effect of Nipping on Growth and Yield of chickpea under Dryland condition" has been conducted.

MATERIAL AND METHODS:

The field experiments were carried out during two years (2014 and 2015) in five villages *viz.* Sundermore, Nipania, Lalpur (Godda Block), Bishaha and Patthargama (Patthargama Block) of Godda District by Gramin Vikash Trust, Kirshi Vigyan Kendra, Godda, Jharkhand. The trail was conducted under on farm trails (OFT) on 10 farmers field to assess yield and economics of Chickpea(cv. Pusa 372) with nipping practice by modified share.

The soil of the experimental site was sandy loam in texture with organic carbon 0.58, available:-

N – 312kg/ha

P_2O_5 – 22.05kg/ha

K_2O - 118.42kg/ha

P^h -6.67

Annual rainfall range between 1000-1250 mm with majority of rainfall occurring during the monsoon season ie. July to September. The average maximum and minimum temperature varied between 12°C to 42°C. The experiment was laid out in randomized bock design with the following three treatments and ten replications:

1. Farmer practice (farmer use nipping process manually)
2. Nipping process by modified shear at 35 DAS
3. Nipping process by modified shear at 45 DAS

Chickpea variety Pusa-372 was sowing during the third fortnight of October during both the year and apply 30kg N/ha, 60kg P_2O_5/ha and 40kg K_2O/ha. All the fertilizer was applied as basal does in the process of nipping the modified iron shear was use which look like mango fruit picker at the time of nipping the tip portion of the plant cut by shear and collect in basket. The two season's data on different aspects of experiment and grain yield were recorded separately. Finally the data were statically analyzed after appropriate transformation according to Gomez and Gomez (1989).

RESULTS AND DISCUSSION:

The result of field experiment conducted by Gramin Vikas Trust – Krishi Vigyan Kendra, Godda (Jharkhand).

Plant Height:

The height of plant is significantly influenced by nipping in chickpea. The significantly tallest plants (128.48cm) were recorded in without nipping (controlled) plots followed by nipping at 45 DAS after sowing (118.86cm) plots and smallest height of plant was observed in nipping at 35 DAS after sowing (110.30cm). These results were supported by Bibek et al (2017).

Numbers of branches per plant:

A significantly differences with respect of numbers of branches per plant was observes due to nipping in various stages of plants. Significantly maximum numbers of branches was recorded nipped plots at 35 DAS (11.58 b/plant) as compared to 45DAS (10.26 b/plant) by modified shear and lowest numbers of branches was recorded in plot without nipping (8.64 b/plant) in similar observations were also reported by Arjun Sharma *et. al.* (2003) who have found more branches in pigeon pea by canopy management at 40 DAS.

Number of seeds/pods:

The data in regards to numbers of seeds/pod of chickpea was at par both the year 2014 and 2015 (polled data) by nipping at 35 DAS by modified shear was at par as compared to control plots and yield.

Growth and yield parameter's:

Significantly higher plants height and number's of branches per plant recorded at all the growth stages of chickpea plant as result among several grain production crops (chickpea, pea, mustard, pigeon pea, etc). The approach of nipping (removed of terminal bud) is being commonly practiced to increase the seed yield and quality. In chickpea removal of terminal buds by hand is the traditionally practiced by the farmers but its beneficial effects are scientifically documented. In traditional nipping removal of terminal bud by hand is disturb the root of plants resulted some plants are dry and this practice also takes more time of farmers. Farmers grow large area of chick pea it is not possible to remove all terminal buds of plant but in case of using modified shear take less time uniformity nipping, less labour ultimately more seed yield and economics. Apical bud nipping break the apical dominance in plant basically hormones(auxin) responsible for growth of terminal bud in chickpea after nipping these how is diverted in auxiliary bud side it may be increase the number of branches, leaves, photosynthetases, pod/plant, seed/pod and other growth parameters. Nipping also alter the source-sink relationship by arresting the vegetative growth and hastening the reproductive phage thus resulting increase the pods/plant, seed/pod, size of seed and seed yield. Similar results were also obtained by Chaudhary *et al* (2018). The reduction in

plant height in nipping plants is mainly due to elimination of apical dominance and diversion of photosynthetase (carbohydrate, lipid, vitamin, protein, etc) from vertical side to flow in horizontal side.

Yield and yield attributes:

Significantly increase in seed yield due to increase in numbers of productive branches/plant, number of seed per pod and 100seed weight (Table 2). Similar result also reported by Singh and Devi (2006). The increase in seed yield of field pea due to significant reduction in plant height and increase in numbers of seed/pod, size of seed and 100 seed weight. Similar result were also be obtained by Sharma *et al* (2003).

100 Seed weight(g):

It is clear from the data presented in Table 2 the 100 seed weight was recorded significantly higher (22.16g) in nipping of chickpea and 35DAS as compared to nipping at 45DAS (21.56g). The lowest test weight were recorded in plots of no nipping (16.96g) with significant difference during both the year 2014 and 2015 polled data the higher seed size may be observed due to increase in photosynthetic area leading to higher photosynthetase accumulation source to sink evident with higher 100 test weight. Similar result was also reported by Sujata *et al* (2016). Nipping at 45 DAS recorded higher 100 seed weight.

Yield q/ha:

Data concerning seed grain yield are shown in (Table 2). Seed yield was significantly influenced by nipping. The maximum seed yield (21.86 q/ha) was achieved in the plots of nipping at 35DAS plots by (17.64q/ha) was recorded in plots of nipping at 45DAS and the lowest seed yield was recorded in controlled plot (12.36q/ha). It is may be the result of less competition for resources, more number of branches, higher number of pods/plant and better intercultural operations at early growth stage were the favorable points, which might have fragged the process at portioning photosynthesis from the source to sink resulting in the higher seed yield. Similar result to increase in yield due to nipping practiced was reported by Baloch and Zubair 2010.

Economics:

The economics analysis was done on the basis of mean yield of crop of two years and existing market price. The maximum net return (Rs:55400/ha) and income per rupee investment (Rs:3.17) was obtain from nipped plot of 35DAS by modified shear followed by nipped plots by modified shear at 45DAS recorded net return (Rs.39990) and (2.65) and lowest return (RS.45114) and (2.13) was recorded in controlled plot (table 2). From the present study it can be inferred that nipping at 35DAS by modified shear can be profitable chickpea grower in different part of India.

Table1 Weather parameter during the crop growth period (mean temperature 2014 and 2015)

Month	Maximum Temperature	Minimum Temperature	Rainfall (mm)
January	12.90	5.20	12
February	17.10	14.81	5
March	19.80	13.64	9
April	37.60	14.19	17
May	37.10	14.11	52
June	35.20	22.21	171
July	35.90	25.01	288
August	35.80	24.68	202
September	31.70	24.58	78
October	21.90	20.86	8
November	18.20	12.78	2
December	17.60	13.98	1

Source: Department of Agriculture , Godda

Table 2 Effect of canopy management in Gram

Treatment	Plant height	No. of branches	Number of grain/ pod	Test wt (100 grains in gram)	Yield q/ha	Cost of cultivation (Rs/ha)	Net return (Rs/ha)	CB ratio
T_1	128.45	8.64	1.30	16.86	12.36	21128	45114	1:2.13
T_2	110.30	11.58	1.50	22.16	21.86	24388	55400	1:3.27
T_3	118.86	10.26	1.50	22.45	17.64	24396	39990	1:2.63
SEM	4.01	6.10	NS	0.20	0.13			
CD	8.02	0.20	NS	0.40	0.27			

REFERENCES

Bloch, M.S. and Zubai, M. 2010. Effect of nipping on growth and yield of chickpea *J. Animal Plant Science*. 20 (3): 2010.

Khan, H. and Latif, A. 2006. Effect of nipping at various stage on yield and yield components of chickpea (*Cicer aritinum*). *J. Res. Science*. pp 235-240.

Aslam M., Khalil, A. H., Hiamayattullah, K., Ayaz, M., Ayaz, M., Eyaz, M. and Arsad, M. 2008. Effect of available soil moisture depletion levels and nipping treatment on growth rate and total biomass in chickpea. *J. Agri. Res.* 46 (3): 229-243.

Dhital, B. Sharma, G. and Khan, A. 2017. Effect of nipping at different days in growth and yield of pea (*Pisum sativum*) in mid hill of Nepal. *Advances in Plants and Agriculture Research*. 7 (4):

Sharma, A., Potdar, M. P., Pujari, B. T., Dharamraj, P. S. 2003. Studies on response pigeon pea canopy management. *Karnatka Journal of Agricultural Science.* 16: 1-3.

Chudhary, U. L. Jat, R. S., Rathore, B. S. and Vinod Kumar, 2018. Effect of nipping on growth assimilate supply and yield of Indian mustard genotype. *Int. Journal of Current Microbiology and Applied Science.* 7(7): 3758-3764.

Singh, M. S., Devi, S., Profitability of nipping in cultivation of pea (*Pisum sativum) an indigenous agrotecnique in Manipur. Indian Journal of Agronomy.* 51(3): pp 206-208.

Sharma, A. Potdar, M. P. and Pujari, B. T. 2003. Studies on response of pigeon pea to canopy modification and plant geometry. *Karnatka J. of Agri. Science*, 16(1): 1-3.

Anonymus 2015.Mimistry of Agriculture, Government of India STAT. data

Sujata, M., Uppar, D. S., Deahpande, V. K. and Nawalagatti. 2006. Seed hardening, nipping and foliar spray of cycocel an growth and yield quietly of chickpea (*Cicer arietinum* L.). *Environment and Ecology*. 35(2): 703-707.

Anonymus 2013. FAOSTAT. data