Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; 9(2): 886-888
Received: 13-01-2020
Accepted: 15-02-2020

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Influence of nipping technology on growth, yield and economics of pigeonpea cultivated under rainfed situation

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Abstract
Pigeonpea is an important pulse crop in the cropping pattern supplying cheap protein diet. The Krishi Vigyan Kendra, Kalaburagi has conducted frontline demonstrations on farmer fields in adopted villages to study the effect of nipping on seed yield of pigeonpea (TS-3R). The results revealed that nipping of the terminal bud in between 45 to 50 days of crop growth stage significantly reduced the height of the plant and increased the number of primary and secondary branches and pods per plant. The nipping operation of pigeonpea crop has given yield increased of 19.59, 17.39 and 14.37 per cent during 2016, 2017 and 2018, respectively over check. The nipping practice in pigeon pea resulted in increased an average three year yield of 13.24 q/ha over check plot (11.28 q/ha). The changes will accelerate the adoption of nipping technologies to increase the productivity of pigeonpea in this area. There is a need to adopt multi pronged strategy which involves enhancing pigeonpea production through horizontal and vertical expansion and productivity improvements.

Keywords: Nipping, pigeonpea, yield and economics

Introduction
Pigeonpea is an important pulse crop and 91 per cent of the world's pigeonpea is produced in India. The crop is largely grown under rainfed situation. Pulse crops also have the unique potentiality to associate symbiotically with *Rhizobium* Sp. and fix atmospheric nitrogen, thereby enriching the soil health. As a result of ever increasing population, the per capita availability of pulses has shown a sharp decline in recent years and it has come to less than 40 g/day at present, against a normal requirement of 69 g/day. The yield of pigeonpea is limited by a number of factors such as agronomic, pathogenic, entomological, genetic and their interaction with environment. Among the different agronomic practices limiting the yield of pigeonpea was the nipping operation is the important factor. Adaptation of proper nipping practice to the crop will go a long way in making efficient use of limited growth resources and thus to stabilize yield.

Nipping in pigeonpea is one of the important parameter for the enhancement of yield and yield contributing parameters. Singh and Diwakar (1995) [7] revealed that foliage nipping at early stages of crop could increase number of branches while restricting profuse vegetative growth thereby promoting crop yield. Nipping at various stages tended to enhance number of branche and number of pods that in turn boost chickpea yield (Aziz, 2000) [1]. Keeping in view the vitality of pigeonpea crop in the cropping pattern of low water ecology and profitable crop for poverty stricken people as well as significance of nipping that could enhance yield.

Materials and Methods
The Frontline demonstrations (200) were organized on farmer's field to demonstrate the impact of nipping technology on pigeonpea under rainfed condition in Kalaburagi district of Karnataka to increase the productivity over three years during *Kharif* of 2015 to 2017. Each frontline demonstration was laid out on 0.4 ha area, adjacent 0.4 ha was considered as control (no nipping). The nipping technology comprised in Table 1. The yield data were collected from both the demonstration and farmers practice by random crop cutting method. Qualitative data were converted into quantitative form and expressed in terms of per cent increase in yield calculated using following formula.

Table 1: Improved technology and Farmers practices of Pigeonpea under FLD

Sl. No	Technology	Demo plot (nipping)	Check	GAP (%)
1	Variety	TS-3R	TS-3R	Nill
2	Herbicide application	Pendimethalin @ 2.5 lit. per ha	Pendimethalin @ 2.5 lit. per ha	Nill
3	Seed rate	10-12 kg/ ha	10-12 kg/ ha	Nill
4	Time of sowing	2 nd week of june	2 nd week of june	Nill
5	Seed treatment	Biofertilizers and Trichoderma	Biofertilizers and Trichoderma	Nill
6	Spacing	90*30cm	90*30cm	Nill
7	Fertilizer dose (N:P:K:Zn kg/ha)	25:50:0:15	25:50:0:15	Nill
8	Nipping practice	One time Nipping in between 45-50 Days after sowing	No nipping	Full gap (100%)
9	Plant protection	IPM	IPM	Nill
10	Grading the produce	Grading the produce	Grading the produce	Nill

Table 2: Effect of nipping on growth and yield of pigeonpea crop

Sl No	Year	plan height (cm)		Primary branches		secondary branches		pod/plant		seed wt (g/100)		Yield (q/ha)		% increase in yield
		Demo plot	Check plot	Demo plot	Check plot	Demo plot	Check plot	Demo plot	Check plot	Demo plot	Check plot	Demo plot	Check plot	
1	2015	172.5	180.3	10.8	8.2	8.4	6.2	98.4	81.2	12.6	12.1	14.7	12.3	19.6
2	2016	164.8	177.6	12.3	7.3	7.8	5.9	104.5	86.7	12.4	12.3	15.5	13.2	17.4
3	2017	158.3	164.7	10.1	6.8	6.5	5.7	87.1	69.5	12.2	12	9.6	8.4	14.4
	Average	165.2	174.2	11.1	7.4	7.6	5.9	96.7	79.1	12.4	12.2	13.2	11.3	17.1

Table 3: Effect of nipping on economics of pigeonpea crop

Sl No	year	Gross return		Net return		B:C ratio	
		Demo plot	Check plot	Demo plot	Check plot	Demo plot	Check plot
1	2015	65925	55125	44050	34375	3.01	2.66
2	2016	69863	59513	47513	38288	3.13	2.80
3	2017	42975	37575	21900	17625	2.04	1.88
	Average	59588	50738	37821	30096	2.73	2.45

Results & Discussion

Comparison of productivity levels between improved production technology in demonstration trials and farmers' practices is shown in table 2. During the study period it was observed that the adoption of nipping technologies in demonstration trials has increased the yield over the farmers' practices.

Growth and yield

The three years of frontline demonstration results obtained are presented in table 2. The nipping one time at 45-50 DAS in demonstrated plots recorded the average number of growth parameters like plant height (165.2 cm), number of primary (11.1) and secondary (7.6) branches, compared check plot (174.2 cm, 7.4 and 5.9, respectively) which was no nipping practice fallowed in crop. This may be due to nipping of terminal buds at 45-50 DAS leads to reduction in plant height and apical dominance and supporting the side branches for getting higher number of branches per plant and higher leaf area which determines the photosynthetic ability, growth and dry matter production of a plant. Nipping of terminal bud at 50 DAS significantly reduced the plant height and increased the number of primary and secondary branches, pods per plant and test weight. Similar results were reported by Mishra and Nayak (1997) [3] in Jute crop

The results revealed that due to one time nipping at 45- 50 DAS in pigeonpea crop in demo plot, demo plot recorded the higher numbers of pods per plant (96.7) compared to check pot (79.1) and there is no much difference in test weight of pigeon pea crop. The increased yield components may be attributed to activation of lateral dormant buds by arresting the terminal growth through nipping of terminal bud which might have facilitated the significant increase in the yield attributes. With respect to yield (table 2), an average yield of three years was increased from 13.2 q/ ha under demonstrated plots as compared check plot 11.3 q/ha. The highest yield in the FLD plot was 15.5 q/ha in 2014 and in farmers practice 13.2 q/ha in the same year and lowest yield was recorded in 2015 due to moisture stress and drought occurrence which lead to restriction in full growth of plants and start the reproductive stage. The average yield of three years in pigeonpea increased 17.12 %. The factors mainly responsible for seed yield variation among genotypes is due to vigorous growth and yield components viz., number of pods per plant, number of seeds per pod, seed yield per plant, 100-seed weight. This results clearly indicated that the higher average seed yield in demonstration plots over the years compare to local check due to knowledge and adoption of nipping operation. The increased yield components may be attributed to activation of lateral dormant buds by arresting the terminal growth through nipping of terminal bud which might have facilitated the significant increase in the yield attributes. Similar findings were reported by Ramanathan and Chandrashekharan (1998) [4] in sesamum crop. Khan *et al*. (2003) [2] who revealed that removing top growth tended to increase seed yield. Rathi and Tripathi (1995) [5] also reported that the chickpea foliage nipped, after 45 or 60 days of planting resulted higher grain yield.

Data in table 3 reveal that the cost involved in the adoption of nipping technology in pigeonpea varied and was more profitable. An average B: C of demonstration field is 2.73 as compared to without nipping plots 2.45. The benefit cost ratio of pigeon pea cultivation under nipping practices in demo plot was higher than farmer's practices in all the years and this

may be due to higher yield obtained under niiping technologies compared to local check (no nipping) due to production of higher groeth and yield parameters will increase the yield of plots and higher gross return compared to control plot. Roy and Singh (1992) [6] also reported higher seed yield and net returns in chickpea when plants were nipped at 30 or 40 days after sowing.

Conclusion

Adoption of one time nipping at 45-50 DAS has resulted in 14.37 to 19.59 per cent increased yield in pigeonpea over a years. Nipping practice in pigeon pea results in increased an average yield of 11.28 to 13.24 q/ha over a years. Comparative to labors, nipping machine covers 4 acer /labour/day. On an average Rs 1000/- can be saved per acre. The attack of tip aerial blight also reduced due to proper nipping. The productivity gain under FLD over existing practices of pigeonpea cultivation created greater awareness and motivated the other farmers to adopt nipping technology in pigeonpea in Kalaburagi district of Karnataka.

References

1. Aziz MA. Response of chickpea to nipping. Pakistan J. Sci. and Indus. Res. 2000; 43(3):191-192.
2. Khan RU, Khan M, Khan TM, Shah J. Cutting chickpea (*Cicer arietinum* L.). Effect on green fodder and seed yield under Rodh Kohi system of Dera Ismail Khan. Pakistan J. Bio. Sci. 2003; 6(2):95-98.
3. Mishra GC, Nayak SC. Effect of sowing date and row spacing on seed on seed production of Jute (*Corchorus* sp.) genotypes with and without clipping. Indian Journal of Agronomy, 1997; 42(3):531-534.
4. Ramanathan SP, Chandra Shekharan B. Effect of nipping, plant geometry and fertilizer on sesame (*Sesamum indicum* L.) Indian Journal of Agronomy, 1998; 43(2):329-332.
5. Rathi YPS, Tripathi HS. Significance of foliage detopping in integrated management of BGM of chickpea. p 183, In proceeding of the I1nd European Conference on Grain Legumes. 9 - 13 July 1995, Copenhagen, Denmark, 1995.
6. Roy RK, Singh BK. Effect of nipping, Seed rates, Seeding methods and fertilizer levels on the grain yield of Chickpea under rainfed "Tal" (Vertisol) condition. International Chickpea Newsletter. 1992; 26:29-31
7. Singh H, Diwakar B. Chickpean botany and production practices. ICRSAT. Skill Development Series 1995, 16.