J Krishi Vigyan 2018, 7 (Special Issue) : 169-171 DOI : 10.5958/2349-4433.2018.00183.6

Short Communication

Berry Drop Management in Black Pepper through On Farm Testing in Uttara Kannada

H M Santhosha[*1], Akkamahadevi D Agasimani[2], Roopa S Patil[3] and M Shivashenkarmurthy[4]

ICAR- KrishiVigyan Kendra, Sirsi, Uttara Kannada (Karnataka)

ABSTRACT

On farm testing was conducted at farmer field to study the effect of different technology options like Di-Ammonium Phosphate and Naphthalene Acetic Acid spray at berry set and fruit development stage, respectively and Naphthalene Acetic Acid at berry set and fruit development stage to prevent berry drop in black pepper. The results indicated that spraying of Di-Ammonium Phosphate 1.5 per cent and 25 ppm Naphthalene Acetic Acid at berry set and fruit development stage has improved many commercially desirable parameters like number of berries per spike, higher per cent reduction in berry drop and yield in black pepper (*Piper nigrum* L.). Benefit cost ratio, however, was also highest in the treatment compromising Di-Ammonium Phosphate and Naphthalene Acetic Acid.

Key Words: Black pepper, Crop yield, Di-Ammonium Phosphate and Naphthalene Acetic Acid.

INTRODUCTION

Black pepper (*Piper nigrum* L.) is a major export oriented spice crop of India. It is a native of the monsoon forests along Malabar Coast of south western India. In India, it is cultivated in an area of 1.35 lakh ha with the production of 64,000 t and the export has been 16,840 t (Anon, 2018). Karnataka, Kerala and Tamilnadu are major spice growing states in India. Uttara Kannada is one of the major black pepper growing districts in Karnataka. In Uttara Kannada, it is cultivated in an area of 1,117 ha with the production of 517 t. The major setback in the cultivation of black pepper in the district is berry drop leading to loss in yield. Spike shedding and berry drop are serious malady that affects the yield of pepper to an extent of 29 per cent and 40 per cent. Abiotic stress like drought, high temperature, nutritional imbalance and biotic stress are the reasons for berry drop in black pepper. These stresses may create a physiological imbalance within the plant, leading to shedding of spikes that adversely affects the productivity of the vines (Kumar *et al,* 2002). Auxins are organic compounds which play a vital role in regulating various physiological processes of plants. Hence an investigation was carried out with growth regulator and nutrient spray to enhance the productivity of pepper vines by reducing berry drop from spikes. On farm testing (OFT) is mainly conducted to evaluate the available suitable technology options for particular area. Keeping these points in view an OFT was conducted with the objective of evaluation of growth regulator and nutrient spray treatments for berry drop management in black pepper.

MATERIALS AND METHODS

On farm testing of available technology options was undertaken at Kenchagadde village of Uttara Kannada district during 2016-17 and 2017-18 by Krishi Vigyan Kendra, Sirsi. The OFT was conducted at 5 farmer's field. The treatments were farmers practice (no spray), Di-Ammonium

Corresponding Author Email : san3070@gmail.com

[1,3,4] ICAR- KrishiVigyan Kendra, Sirsi, Uttara Kannada (Karnataka)

[2]ICAR- KrishiVigyan Kendra, Dharwad (Karnataka)

Phosphate (DAP) @ 1.5 per cent and Naphthalene Acetic Acid (NAA) @ 25 ppm spray at berry set and fruit development stage and NAA @ 40 ppm spray at berry set and fruit development stage. The recommended package of practices was followed to raise the crop. The observation on per cent berries per spike at the time of first harvest, per cent reduction in berry drop and yield were recorded. Per cent berries per spike were calculated based on the observations like total number of berries set/ spike and berries drop/spike.

RESULTS AND DISCUSSION

Effect on number of berries per spike and reduction in berry drop

Number of berries per spike was found to be highest in the treatment where 1.5 per cent DAP and 25 ppm NAA were sprayed at berry set and fruit development stage, respectively (Table 2). Further, application of NAA @ 40 ppm at berry set and fruit development stage also showed significantly more number of berries per spike at the time of first harvest as compared to farmers practice. These results were in close conformity with findings of Mahindre *et al* (2018). More number of berries in the treatment with 1.5 per cent DAP and 25 ppm NAA spray is due to the highest per cent reduction in berry drop. The other treatment of spraying NAA @ 40 ppm also showed reduction in berry drop (Table 1).

Table 1. Effect of berry drop management treatments on per cent reduction in black pepper berry drop over control.

Treatment	Per cent reduction in black pepper berry drop over control	
	2016-17	2017-18
TO1: No sprays	-	-
TO2: DAP - NAA	10.07	11.94
TO3: NAA - NAA	8.92	7.50

Effect on yield

Application of 1.5 per cent DAP and 25 ppm NAA found significantly superior over NAA @ 40 ppm treatment followed by farmers practice. It can be revealed (Table 2) that significantly highest berry yield were observed under 1.5 per cent DAP and 25 ppm NAA spray (13.99 q/ha) and NAA @ 40 ppm spray (13.62 q/ha) as compared to farmer practice (12.89 q/ha). Application of 1.5 per cent DAP and 25 ppm NAA at berry set and fruit development stage respectively recorded 8.53 per cent higher dried berry yield than farmers practice. Similar results were reported by Singh *et al* (2015).

Table 2. Effect of berry drop management treatments on per cent berry per spike and yield of black pepper.

Treatment	Per cent berry per spike (Pooled)	Yield (q/ha) (Pooled)
TO1: No sprays	67.23	12.89
TO2: DAP - NAA	74.44	13.99
TO3: NAA - NAA	72.54	13.62
SE(m)	0.55	0.13
SE(d)	0.78	0.19
C.D. 5%	1.62	0.39

Economics of berry drop management

On the basis of pooled data (Table 3), 1.5 per cent DAP and 25 ppm NAA spray fetches the significantly highest net return and B:C ratio (Rs.4,19,256 /ha and 3.34) followed by NAA @ 40 ppm spray treatment. The lowest B:C ratio was observed under farmers practice. Similar findings were also reported by Shil and Nath (2016) and Gare *et al* (2017).

CONCLUSION

On the basis of two years data, it may conclude that application of 1.5 per cent DAP and 25 ppm NAA at berry set and fruit development stage respectively gave significantly higher number of

Table 3. Effect of berry drop management treatments on economics of black pepper.

Treatment	Net return (Rs /ha)			B:C Ratio		
	2016-17	2017-18	Pooled	2016-17	2017-18	Pooled
TO1: No sprays	3,21,852	3,69,873	3,46,351	2.83	3.06	2.94
TO2: DAP - NAA	4,37,034	4,01,950	4,19,256	3.46	3.23	3.34
TO3: NAA - NAA	4,16,664	3,93,750	4,04,587	3.34	3.16	3.25
SE(m)	12,294	4036	7,756	0.05	0.02	0.03
SE(d)	17,386	5707	10,969	0.07	0.03	0.05
C.D. 5%	35,798	11,751	22,585	0.16	0.06	0.10

berries per spike, dried berry yield, net return and B:C ratio as compared to all other treatments tested and significantly reduced the berry drop in black pepper.

ACKNOWLEDGEMENT

Authors are sincerely thankful to ICAR - Agricultural Technology Application Research Institute (ATARI), Zone XI, India for having provided financial and technical support to conduct this study.

REFERENCES

Anonymous (2018). www.indianspices.com. Spice Board India, Ministry of commerce and industry, Govt. of India.

Gare B N, Raundal P U and Burli A V (2017). Effect of plant growth regulators on growth, yield and yield attributing characters of rainfed chilli (*Capsicum annuum* L.). *Adv Agril Res Tech* **1** (2):195-197.

Geetha C K and Nair P C S (1990). Effect of plant growth regulators and zinc on spike shedding and quality of pepper. *Indian Cocoa Arecanut and Spices J* **14** (1):10-12.

Mahindre P B, Jawarkar A K, Ghawade S M and Tayade V D (2018). Effect of different concentration of plant growth regulators on growth and quality of green chilli. *J Pharma and Phytochem* SP1: 3040-3042.

Shil S and Nath D (2016). Effect of NAA on growth and yield attributes of chilli during winter season under climatic condition of Tripura. *International J Agric Sci,* **8** (51): 2192-2193.

Singh D K, Rudra B C, Das B and Gangopadhyay P K (2015). Effect of Naphthalene Acetic Acid on yield of chilli (*Capsicum annuum* L.). *J Agric Technol,* **2**(1&2): 84-86.

Received on18/10/2018 *Accepted on 16/12/2018*