



Research Article

EFFECT OF NAA ON GROWTH AND YIELD ATTRIBUTES OF CHILLI DURING WINTER SEASON UNDER CLIMATIC CONDITION OF TRIPURA

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Abstract- An experiment was conducted in the instructional farm of KVK, West Tripura during rabi season of 2014-15, with an objective to find a proper dose of NAA to control premature flower and fruit drops in chilli. The growth regulator (NAA) was sprayed two times once at 35th and second at 45th days after transplanting. The treatment comprises of T₁: NAA @ 5 ppm, T₂: NAA @ 10 ppm, T₃: NAA @ 20 ppm, T₄: control. The result of the experiment revealed that NAA application significantly influences the yield attribute of chilli. It was observed that maximum plant height (39.45 cm), maximum number of branch per plant (18 nos.), maximum numbers of chilli per plant (250 nos) and highest yield (11.2 t/ha) was recorded in T₃ followed by T₂ and lowest was in case of control.

Keywords- NAA, Chilli, Fruit drops.

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Introduction

Chilli is an important spice crop belongs to the family of "Solanaceae" and genus of "Capsicum" and India is the largest producer of it. Chilli fruits are good source of Vit A and C. Basically, chillies contain capsaicin, which gives a strong burning sensation when eaten and the red colour is because of the presence of pigment capsanthin. Chilli can be grown in open fields, greenhouses, polyhouses, under shade nets, pots, containers, even in back yards. Commercial cultivation of chilli is very much successful and one can expect decent profits in chilli farming due to its market value in local areas and international markets. India is a rich source of chilli genotype and the yield of this genotype depends on different factors like inherent genetic potential, agro climatic condition and management practice. In order to enhance productivity further application of growth regulator is found beneficial. One of the major factors in affecting productivity of chilli is the use of proper growth regulator at proper time to control flower and fruit drop [1,2]. It has been observed by the scientist that all the plants synthesize minute quantities of different phytohormones in their body and the endogenous level of these has direct influence on the yield of any crop. PGRs at lower concentration act as a promoter but at higher concentrations act as inhibitor. In order to further enhance the productivity of chilli per unit area of land per unit of time, the application of plant growth regulating substances has been found beneficial. The regulating substances can be applied to modify assimilative activities, growth and developmental functions and to intensify the effects of environmental variables. These chemicals are helpful in checking the yield. But the optimum concentrations of PGRs suggested by different workers is variable ranging from as low as 1 ppm to as high as 1000 ppm. Keeping in view, the effect of one of the important PGR i.e. NAA was studied to improve plant characteristics.

Materials and Methods

The experiment was conducted during *rabi* season of 2014-15 in the experimental field of KVK, West Tripura, during 2014-15. For the experiment chilli variety local

(Balijhuri) was taken. This local chilli is very much popular among the farmers for winter season cultivation. Seeds were collected from one of the renowned chilli growers of the khawai district. For cultivation, the whole package practice was followed by as per the recommendation of ICAR for NEH region. To evaluate the effect of NAA on chilli the crops were sprayed with different concentration of NAA (T₁: NAA @ 10 ppm, T₂: NAA @ 20 ppm, T₃: NAA @ 25 ppm, T₄: control) at 35th and 45th days after transplanting.

KVK, West Tripura is located in the District Khawai Tripura, at an altitude of 23m mean sea level, latitude 23.84N, longitude 91.27E. The climate of Khawai Tripura District is humid sub tropical with minimum and maximum temperature ranging between 10.10C to 25.40C and 23.10C to 33.90C. The summers are humid, dry and hot whereas winters are cool. Occasionally light rains occur during winter season also. Soil texture of the experimental site was sandy loam, acidic with PH 5.8, 0.52% organic carbon, low in available nitrogen (217.65 kg/ha), Medium in available phosphorus (22.82 kg/ha) and available potash (177.68 kg/ha). Parameters that were given consideration are plant height, days taken for first flowering total numbers of fruit per plant, total yield

Results

The effect of application of different concentration of NAA on growth and yield of chilli has been presented in the table. The data presented on the table revealed that NAA has positive effect on the plant height and the highest was 39.45 cm when the plants were sprayed with NAA 20 ppm where as the lowest was found in the control plot. Similarly the time required for first flowering was also considered for the analysis. For chilli (balijhuri) the normal flowering, i.e. when the crop is not sprayed with any growth regulator was 75 days after transplanting. From presented data it can be observed that in case of all concentration of NAA has positive effect on early flower initiation. It is recorded that when NAA has been applied @ 20 ppm the initiation of flowering was earlier by almost one week. Similar, finding was

recorded by the other researcher [3]. This is an important factor considered by the farmers as they can be able to harvest their product by one week earlier, which leads to fetch more prices in the market.

Table-1 Effect of different concentration of NAA on different growth and yield attribute of chillies

Treatment	Plant height	Days taken for first flowering	Numbers of fruit per plant	No. of branch per plant	Yield per plant (g)	Yield per Ha (t)
NAA 5	35.20	70	188	15	195.6	9.0
NAA 10	37.78	70	237	17	212.4	10.0
NAA20	39.45	68	250	18	250.7	11.2
Control	35.05	75	180	15	200.8	9.2
SEM	4.12	NS	13.95	NS	5.15	3.4
LSD 0.05	1.39	1.89	4.48	1.25	1.63	1.19

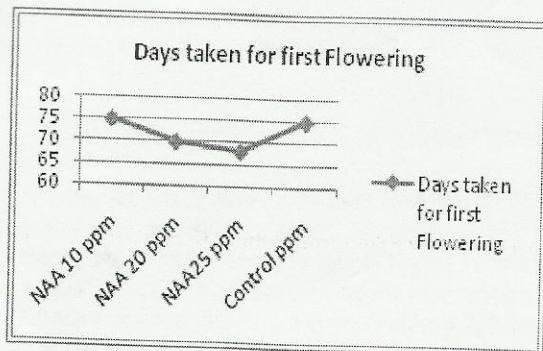


Fig-1 Days Taken for First Flowering

Number of fruits and the number branches per plant were higher in the NAA treated plants as compared to control. And the highest was recorded in NAA 20 ppm, it significantly increases the numbers of fruit (250) and number of branches (18) per plant. Premature fruit drop and flowers drops is mainly due to formation of abscission layer. The reduction of chlorophyll content in leaves also triggers dropping [4]. While some researchers originally believed abscisic acid to be hormone that stimulates abscission. Auxin, a plant hormone and ethylene works in a synergistic way. As the auxin levels decrease, the flux of auxin to the abscission zone reduce. Exhaustion of auxin makes the abscission layer sensitive to ethylene [5].

Yield being the most important outcome of any crop related experiment was significantly given consideration. NAA applied at different concentration at two stages of crop growth increased the yield of chilli considerably [6,7]. It has been recorded that NAA significantly increases the yield and better return. Higher yield in NAA sprayed plants might be attributed to the higher chlorophyll content as it is known to increase chlorophyll. Chlorophyll aids in higher photo synthetic rate resulting in more carbohydrate synthesis ultimately higher yield [8].

Conflict of Interest: None declared

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