

The Effect of Plant growth regulators (PGRs) on the germination percentage in Brinjal (*Solanum melongena* L.)

ADESH KUMAR AND V. K. BHATNAGAR

Deptt. of Botany, Hindu (P.G.) College, Moradabad

Abstract

The study was carried out at Hindu P.G. College, Moradabad U.P. The experiment on germination reveals the significant effect of cycocel, gibberellic acid and ethephon on germination percentage in different concentrations in all varieties. The maximum germination percentage (80.90%) was observed in 800 mg/l in Arka Keshev while lower concentration (10, 25, 50, 100 & 200 mg/l) showed a decline trend of percentage in germination of seeds. GA₃, Cycocel, Ethenphon are natural phytohormones of wide occurrence in plants and involve in variety of plants growth and development process.

Keyword : germination, gibberellic, Cycocel, Ethephon, GA₃

Introduction

Brinjal or eggplant (*Solanum melongena* L.) is an important Solanoceous crop of sub-tropics and tropics. The name of brinjal is popular in India. Bisaria and Bhatnagar (1978) and Bhatnagar (1979) in *Solanum melongena* have observed a marked increment in length. Brinjal Fruit (Unripe) is primarily consumed as cooked vegetable in various ways and dried shoots are used as fuel in rural areas. It is low in calories and fats contains mostly water, some protein, fibre and carbohydrates. It is a good source of minerals and vitamins and in rich in total water soluble sugars, free amide protein. Ethephon has been found to affect the growth and development of flowering plants (Burg, 1968; Cooke and Anon, 1969) and causes diverse responses in plant metabolism. Brinjal seed germinate one to two weeks after sowing. Seedling grown in containers are ideal because they allow field planting without disturbing the root system. A main stem with 6-10 leaves develop before the appearance of first flower. Depending on whether the sowing period corresponds to more or less favorable agro climatic conditions, the first flowers appears one and a half to three months after sowing. Gibberellins have been reported to affect almost all plant organs but their spectacular effects are still on stem elongation (Long, 1970; Weaver, 1972; Low, 1975). This suggests that there lies a great scope for the improvement of this crop through the application of the knowledge of growth regulators, specially Cycocel, Ethephon and GA₃. With

in hardly a quarter of century, the majority of crop improvement Agriculture and horticultural crops have invariable taken resource to the use of growth hormones. This suggests that their lies a great scope for the improvement of this crop through the application of the knowledge of growth regulators specially Cycocel, Ethephon and GA₃. Application of growth retardants may also enhance the chlorophyll contents of leaves which helps to increase the functional far a the source for a longer period leading to improved partitionly efficiency and increased productivity. Moond and Gehlot (2006) and Rakesh (2006) studies the effect of foliar spray of ccc on duration of flowering, flower yield chrysanthemum flower. Cycocel has been reported to alter the chemical composition of fruits. Bhatnagar and Bisaria (1979).

Material and Methods

The certified seeds of cultivar have been obtained from Agronomy Department of G.B. Pant University of Agriculture and Technology Pant Nagar (U.A.) and I.A.R.I. Pusa, New Delhi. GA₃ obtained from Central Drug House (P) Ltd., New Delhi. The Seed germination experiments was carried out in plant physiology lab, Department of Botany, Hindu college, Moradabad. The optimum temperature for germination is 30.7°C to 35°C and it does not germinate below 15.6°C. First the solution of GA₃, Cycocel, Ethephon prepared in different concentration for imbibition/soaking. Sterilized with 0.1% HgCl₂ for 5 minutes and

selected for experimentation and after this are soaking for 12 hours at 10, 25, 50, 100, 500, 400 and 800 ppm level. After soaking seeds were transferred into petreplate and the petreplate kept in B.O.D. at room temperature (30-35°C) for germination. Regular and uniform moisture is maintain by distil water and calculated the growth parameter at periodic interval. Germination counts were made with the emergence of the redicale to a length of 2cm after day of incubation. The mean values for the percentage germination were calculated for each treatment.

Results and Discussion

In this experiment various phytohormones were sprayed to after seedling emergence. Germination emergence and seedling establishment is a very important phase in the cycle of a crop and plant science successful germination and seedling establishment are essential for increasing crop

Table 1: The Effect of Cycocol GA₃, Ethephon on Germination percentage in different Cultivars of Brinjal

Treatments		Germination percentage		
Phyto-hormones	Conc. (ppm)	Azad Kranti	Arka Keshev	Pant Rituraj
Control	D.W.	64.20	65.10	58.15
Cycocol	10	73.20	76.90	66.80
	25	72.70	76.35	66.11
	50	72.30	76.00	65.20
	100	71.18	75.80	64.30
	200	70.90	75.00	64.00
	400	70.40	74.32	63.70
	800	70.10	70.00	63.80
Gibberelic acid 79.87	10	82.92	86.12	
	25	83.16	86.78	80.12
	50	83.50	87.12	80.53
	100	84.00	87.93	80.86
	200	84.73	88.00	81.19
	400	85.42	88.64	81.53
	800	85.92	88.90	82.00
Ethophon	10	69.20	77.10	62.16
	25	67.22	76.82	61.18
	50	65.12	75.12	60.02
	100	64.30	74.00	58.66
	200	63.22	73.50	57.60
	400	58.70	72.10	55.20
	800	57.00	70.00	50.30
C.D. at 5%		2.30	2.50	02.10

* Significant at 5% probability level
Statistically not analysed

production. GA₃ showed significantly superior germination in all concentrations in all varieties and Cycocol showed significantly best germination compared to Ethephon and control in all varieties in all concentration. The maximum percentage (75.90%) was recorded in Arka Keshav followed by Azad Kranti (73.20%) and Pant Rituraj in different concentration of cycocol. The maximum percentage (88.90%) was observed in 800 mg/l in Arka Keshev while lower concentration (10, 25, 50, 100 and 200 mg/l) showed adecline trend of percentage in germinating of seeds (Table 1).

References

Anon (1969). Technical service data sheet on ethrel supplied by M/s Agromore Ltd., Bangalore.
 Bharnagar, V. K. (1979). Studied on the effect of 2-chlorethyl phosphonic acid on growth, fruit-set and yield in brinjal (Solanum melongena L.) Proc. Ann. Conf. of SAB Punjab Agri. Univ. Ludhiana pp: 85.
 Bhatnagar, V. K., Bisaria, A. K. (1998). Influence of gibberellic acid and Ethephon on soluble sugar and protein in seedling of Okra (Abelmoschus esculentus (L.) Moench). Bangladesh. Jour. Bot., 7(2): 37-39.
 Burg, S. P. (1968). Ethylene plant senescence and abscission, Plant Physiol 43: 1503-1511.
 Cooke, A. R. and Randall, D.L. (1968). 2-Halo ethane phosphonic acid as ethylene releasing agent for the induction of flowering in pine apples, Nature, 218-274.
 Lang, A. (1970). Gibberellin structure and metabolism, Ann. Rev. Plant Physicol 21: 537-570.
 Low, H.K. Veronica (1975): Rate of gibberellin in root and shoot growth in gibberellins and plant and plant growth (ed.) Krishna Moorthy, H.N. Wiley Eastern Limited, New Delhi, pp. 101-111.
 Moond, S. K. and Gehlot, G. (2006). Effect of sprays of GA₃, ccc and MH on duration of flowering flower yield of chrysanthemum flower. Haryana J. hort. sci., 35(1-2) 69-71.
 Moond S.K. and Rakesh (2006). Effect of GA₃, ccc and MH on vegetative growth and yield of chrysanthemum Haryana J. hort. Sci., 35 (3+4): 258-259.
 Weaver, R. J. (1972). Plant growth substances in Agriculture. W.H. Freeman and company, Sanfrancisco pp. 594.