

Responses of different cucurbits stem cuttings to IBA

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Abstract

An experiment was conducted to examine the efficacy of different doses of IBA (250 and 500 ppm) on stem cuttings of cucumber, sponge gourd and tinda commonly grown in Baran district of Rajasthan. The stem cuttings treated with 500 ppm IBA induced earlier, profuse rooting and maximum survival percentage than 250 ppm IBA and rainy season was found favourable for rooting in all cucurbits i.e. cucumber, sponge gourd and bitter gourd. Highest dose of IBA also produced maximum branching and takes one week lesser time to induce flowering and fruits were harvested slightly earlier than other treatment. Flower induction was slightly earlier in summer season than rainy season in all the cucurbits. The response of 500 ppm IBA was more effective to increased the yield (219.51 - 254.01 q/ha) in the entire cucurbit crop and harvested about one week earlier than other treatment.

Key words: *Cucurbits, cucumber, indole butyric acid, sponge gourd, stem cutting and tinda.*

Introduction

High cost and unavailability of true to true type cucurbit seed in the market are the major constraints of its cultivation. However, rapid multiplication of cucurbits by stem cuttings has been the answer to such problem in cucurbits. Some perennial cucurbits like pointed gourd and kundru etc. (Choudhary, 1996), pumpkin (Singh, 1997), bottle gourd and bitter gourd (Singh, 2004) has been successfully propagated by stem cuttings.

The application of plant growth regulators increased the rooting and fruiting in tomato, pumpkin, bottle gourd and bitter gourd (Singh, 1999, Singh, 1997 and Singh, 2004). The present experiment was taken to examine the efficacy of different doses of IBA on vegetative propagation of different cucurbits commonly grown in Baran district of Rajasthan.

Material and Methods

The experimental material which consisted of 15-20 cm long cuttings (1.0 to 1.25 cm thick with 4-5 nodes) were harvested with the help of sharp knife from the tip portion of two month old available mother plants of cucumber (*Cucumis sativus* L.), sponge gourd (*Luffa cylindrica* Roem) and tinda (*Praecitrullus fistulosus* Pang.) varieties Pusa Sanyog, Pusa Chikni, Arka Tinda respectively on 10 August, 2008 and 10 March 2009. The 4 to 5 cm basal portions of 25 cuttings were treated with the solution of either 250 or 500 ppm indole butyric acid and these cutting were compared with control constituted water treatment only. The treated cuttings were subsequently planted in field at a distance of 2.5m X 1.0 m on the eastern side of ridges. The treatments were replicated thrice in factorial randomized block design. Uniform cultural operations were adopted during the course of investigation. The survival of cuttings were recorded after one month of planting and presented as per cent of total cutting planted.

Subsequently, 5 cuttings were randomly tagged in each treated plots.

All shoots emerging from these cuttings were counted and these cuttings were then uprooted for the counting of number of roots and its length. The number of days taken to flowering was counted at the time of first flower emergence. Yield was recorded at the time harvesting done at green tender stage.

Results and Discussion

Data revealed a profuse rooting and survival of cutting treated with IBA (Table 1). The total number of roots and its length was higher in 500 ppm IBA treated stem cuttings than 250 ppm IBA in all the cucurbits and required 2 to 3 day lesser time to induce rooting. Maximum rooting was recorded in rainy season sponge gourd followed by cucumber and tinda. The survival percentage of 500 ppm IBA treated stem cuttings was higher in sponge gourd (78.73- 94.15), cucumber (78.22-93.75) and tinda (35.93-49.87) in both the season than 250 ppm IBA. Probably maximum survival percentage was recorded due to increase of roots in plant growth regulator treated cutting (Singh, D.K.2004). Maximum survival of cuttings was also due to the presence of differential level of endogenous rooting cofactors (Pandey *et.al.*, 1983) and carbohydrates (Hartmann and Kester, 1989) and C: N ratio (Bose and Som, 1986) implicated in rooting of plant species.

The number of branches and yield were better (table 2) in IBA treated stem cuttings of cucurbits. The cuttings treated with highest dose of IBA (500 ppm) produced maximum branching and takes one week lesser time to induce flowering. Flower induction was slightly earlier in summer season than rainy season in all cucurbits. The mature vines of all cucurbits take minimum time to induce flowering. The response of 500 ppm IBA was more effective to increase the yield (219.51 - 254.01 q/ha) and

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harvested slightly earlier than other treatment. The increase in yield was due to the induction of early flowering, fruiting and number of branch per plant. Similar increase in yield was reported in pumpkin, bottle gourd, bitter gourd and

tomato (Singh, 1997, Singh, 1999) stem cuttings. The earlier crops in treated cuttings fetches good price in market and save the seed cost of cucurbits. The costs of other cultural operations were similar to seed crops.

Table 1: Performance of different cucurbits stems cuttings to IBA on rooting and survival of plants

Treatment IBA (ppm)	No. of root/plant		Length of root (cm)		Days required for rooting		Survival %	
	Rainy	summer	Rainy	summer	Rainy	summer	Rainy	summer
Cucumber								
Control	31.24	23.28	08.82	08.14	13.44	15.72	85.32	72.35
250	37.88	32.49	10.41	09.22	10.32	14.23	91.81	76.82
500	42.98	36.38	11.84	11.23	10.12	13.74	93.75	78.22
Sponge gourd								
Control	31.51	23.53	08.93	08.97	12.93	15.48	89.22	72.47
250	38.34	32.77	10.35	09.34	10.32	14.05	92.25	76.48
500	43.8	36.13	11.89	11.35	10.05	13.35	94.15	78.73
Tinda								
Control	22.35	15.74	06.37	05.87	16.12	18.39	41.18	33.47
250	28.25	21.01	07.94	06.14	14.37	16.47	46.52	35.54
500	29.41	22.49	08.01	06.58	13.68	15.89	49.87	35.93
CD(0.05)								
Treatment	2.14	2.16	0.98	0.88	1.22	NS	3.47	3.10
Cucurbits	2.46	2.21	0.99	0.94	NS	NS	NS	NS
Interaction	NS	NS	NS	NS	NS	NS	NS	NS

Table 2: Performance of different cucurbits stem cuttings to IBA on growth and yield of plants

Treatment IBA (ppm)	No. branch/plants		Days required for flowering		No. of days taken to harvest		Yield (Q/ha)	
	Rainy	summer	Rainy	summer	Rainy	summer	Rainy	summer
Cucumber								
Control	9.53	6.31	44.46	44.21	54.19	52.16	201.41	200.12
250	11.14	8.53	39.27	38.71	49.01	47.58	244.85	244.11
500	11.90	9.32	37.12	35.12	47.59	45.13	254.01	252.45
Sponge gourd								
Control	9.59	6.55	44.54	42.31	50.84	48.47	208.52	207.15
250	11.54	8.63	39.48	37.11	44.12	41.68	214.28	214.07
500	11.95	9.38	37.58	36.26	42.15	41.18	228.35	227.48
Tinda								
Control	6.05	4.33	44.31	43.41	50.09	48.47	191.48	190.98
250	7.53	4.99	40.12	38.98	44.75	43.08	201.47	200.96
500	7.97	5.64	39.10	38.09	42.07	41.86	220.14	219.51
Treatment	0.48	0.69	2.15	2.14	2.04	2.18	1.01	0.98
Cucurbits	0.61	0.71	2.34	2.87	2.27	2.68	2.41	1.86
Interaction	NS	NS	2.14	2.21	NS	NS	NS	NS

References

- Bose, T. K. and Som, M. G. 1986. Vegetable crops in India. Naya Prokash, Kolkata. pp.254.
- Chaudhary, B. 1996. Vegetables. National Book Trust, New Delhi, pp.173-83.
- Hartmann, H. T. and Kester, D. E. 1989. Plant Propagation: Principles and Practices. 4th edn. Prentice Hall of India Pvt. Ltd., New Delhi, pp. 214-22.
- Pandey, D., Tripathi, S. P., Upadhyay, S. H. and Tewari, J. P. 1983. Biochemical basis of walnut rooting through stooling II. Effect of carbohydrate, nitrogen fraction, rooting cofactor and inhibitors. *Punjab Horticulture Journal*, 23: 203-208.
- Singh, D. K. 1997. A note on effect of paclobutrazole and IBA on stem cutting of pumpkin. *Vegetable Science*, 24: 176-178.
- Singh, D. K. 1999. Response of hybrid tomato (*Lycopersicon esculentum*) to growth regulators. *Indian Journal of Agriculture Science*, 69: 51-53.
- Singh, D. K. 2004. Performances of different cucurbits stem cuttings to IBA. *The Horticulture Journal*, 17(1): 83-87.