Agric. Sci. Digest, 21 (2) : 97 - 99, 2001

EFFECT OF PLANT GROWTH REGULATORS ON SURVIVAL AND VEGETATIVE GROWTH OF GRAPEVINE CUTTINGS

V.N. Patil, P.S. Chauhan, R.S. Shivankar, S.H. Vilhekar and V.S. Waghmare

Department of Horticulture,
Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola - 444 104, India

ABSTRACT

The plant growth regulators were tried to improve survival and growth of hard wood cuttings of grape cultivars Tas-e-Ganesh and Kismis chorny. The cultivar Kismis chorny showed maximum survival percentage than cv. Tas-e- Ganesh. While these two varieties did not differ much in their vegetative growth characters. Use of plant growth regulators *viz.* IBA and NAA helped greatly in producing nursery plants with better survival and shoot growth. The concentration of 100 ppm IBA and 100 ppm NAA were significantly superior over control in respect of survival percentage and most of the vegetative growth characters. The combination of growth regulators (IBA+NAA) were detrimental in respect of all characters studied.

The grape is one of the most delicious, refreshing fruit. Considering the advantages, demands for the crop is increasing day by day and is gaining much importance in the fruit industry. The grape vine are generally propagated by vegetative method such as hard wood cutting. Vegetative propagation is preferred because the plants propagated by this method produce fruits early, give more yield and true to type and quality fruit every year. The treatment of cuttings with plant growth regulators play an important role in regeneration of plants from cuttings. Reports on the systematic investigation on the propagation of grape from cuttings are very scanty. Therefore, it is felt necessary to undertake the study on propagation of grape vines by using different concentration of growth regulators for quicker multiplication in nursery.

The present investigation was conducted in two grape varieties. *viz.* Tas-e-Ganesh and Kismis chorny at Main Horticulture Garden, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, from October 1998 to December 1998 to study the survival percentage and vegetative growth in two commercial varieties of grape as influenced by different plant growth regulator treatments *viz.* IBA, NAA and their combinations (each in 100, 200 and 300 ppm concentrations) and the distilled water was used as a control. The experiment was laid out in Factorial Randomized Block Design with three replications with 50 cuttings per treatment.

Hard wood cuttings of 20 to 25 cm length and of about 1.0 to 1.5 cm diameter with 3-4 swollen buds were taken from five year old grape vines in the month of October 1998. These cuttings were dipped for six hours in plant growth regulator solutions of desired concentration and then planted in polythene bags on 7th October, 1998 containing identical pot mixture. These polythene bags were watered daily and were kept under full sunlight.

The results presented in Table-1 clearly showed that the survival of cv. Kismis chorny was found to be significantly superior over cv. Tas-e-Ganesh. However, the cuttings of cv. Tas-e-Ganesh and Kismis chorny did not differ much in their vegetative growth characters. While the cv. Kismis chorny recorded maximum leaf area than cv. Tas-e-Ganesh. The findings of the present investigation, thus suggest that the cuttings treated with 100 ppm IBA recorded maximum survival percentage over control, the difference was found to be statistically significant. The next best treatment was 100 ppm NNA. However, the higher concentration of plant growth regulator proved detrimental and the survival percentage was sever-

ally reduced. These results are in line with the finding of Singh, *et al.* (1971), Singh and Singh (1973) and Kawai (1996). However, Zhang Peiyu *et al.* (1997) reported that the cuttings treated with 50 or 100 mg IBA per litre or 150 mg per litre reached 83 to 90 per cent survival. The combination of growth regulators (IBA+NAA) was found to be injurious and recorded minimum survival percentage than other treatments. Alley (1961) reported that the mixture of IBA+NAA was detrimental to the rooting of grape vine cuttings.

Table 1. Effect of plant growth regulator treatments on the survival and vegetative growth of grape cuttings cv. Tas-e-Ganesh and Kismis chorny

Treatment	Survival percentage	Number of sprout per cutting	Length of longest sprout per cutting (cm)	Thickness of sprout per cutting (mm)	Number of leaves per cutting	Leaf area per cutting (sq. cm)
Varieties						
Tas-e-Ganesh	42.60 (39.80)	1.31	8.26	3.14	9.01	1069.47
Kismis chorny	49.66 (44.11)	1.36	8.02	3.23	9.19	1105.04
S.E. (m)±	0.40	0.029	0.143	0.081	0.154	13.20
C.D. at 5%	1.14	-	-	-	-	37.33
Plant Growth Regulators						
IBA-100 ppm	86.33 (68.67)	1.26	10.21	4.57	11.82	1205.31
IBA-200 ppm	68.66 (56.13)	1.46	9.91	4.02	10.60	1224.86
IBA-300 ppm	44.00 (41.52)	1.60	8.81	3.26	9.50	1028.15
NAA-100 ppm	76.00 (60.80)	1.26	10.08	4.10	11.10	1133.74
NAA200 ppm	60.66 (51.18)	1.50	10.16	3.53	10.00	1122.24
NAA-300 ppm	39.66 (39.00)	1.63	9.08	2.53	8.66	1067.60
IBA-100 ppm+ NAA-100 ppm	18.66 (25.45)	1.10	5.41	2.24	7.33	1019.64
IBA-200 ppm+ NAA 200 ppm	8.66 (6.80)	1.10	4.71	1.94	6.63	1027.67
IBA-300 ppm+ NAA 300 ppm	5.00 (12.86)	1.10	5.38	1.93	6.86	1005.91
Control	53.66 (47.13)	1.36	7.63	3.71	8.50	1140.08
S.E. (m)±	0.90	0.065	0.321	0.18	0.345	29.51
C.D. at 5%	2.55	0.186	0.908	0.518	0.988	83.49

The plant growth regulator treatments was found to be satistically significant among almost all vegetative growth characters. The cuttings treated with 300 ppm NAA and 300 ppm IBA recorded maximum number of sprouts per cutting. While, the 100 ppm IBA and 100 ppm NAA recorded maximum number of leaves per cutting. It was clear from the above result that the synthetic auxins like IBA and NAA play an important role in producing more number of shoots and leaves. The profuse rooting which occurs due to the exogenous application of these growth regulators results in more production of food material. Thus stored food material is responsible for early sprouting of buds per cent on the cuttings and

thus increase more number of shoots and leaves. These results are in agreement with the findings of Singh and Singh (1973). The cuttings treated with 100 ppm IBA and 100 ppm NAA recorded maximum length of sprout and maximum thickness of sprout per cutting. These results are in close confirmity with the findings of Singh *et al.* (1971).

Leaf area per cutting was found to be statistically significant among different growth regulator treatments. The cuttings treated with 100 ppm IBA was found to be significantly superior over other treatments. Leaf area is one of the major character contributing to the vegetative growth of the plant. The increase in the leaf area, increases the photosynthetic activity resulting into increased carbohydrates which results in high growth.

REFERENCES

Alley, C.J. (1961). *Am. J. Enol. Vitic.* 12: 185-190.
Kawai, Y. (1996). *J. Jap. Soc. Hort. Sci.* 65(1): 33-39.
Singh, R. *et al.* (1971). *Panjab Hort. J.* 11: 146-151.
Singh, R. and Singh, P. (1973). *Panjab Hort. J.* 13(2-3): 166-170.
Zhang Peiyu, *et al.* (1970). *China Fruit.* 1:28-29.