Effect of Different Growth Regulators on Fruit Setting in Grape (*Vitis Vinifera* L.)*

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ABSTRACT

An investigation connected with effect of 10, 20 and 40 ppm each of Naphtheleneacetic acid (NAA) and Gibberellic acid (GA) and 2.5, 5, 7.5, 10, and 20 ppm each of 2,4-Dichlorophenoxyacetic acid (2,4-D) and 2,4,5—Trichlorophenoxyacetic acid (2,4,5-T) on fruit setting in Thompson seedless and Anab-e-shahi varieties of grape was carried out at Rajasthan college of Agriculture, Udaipur. GA 20 ppm in Thompson Seedless and 10 ppm in Anab-e-shahi gave the maximum berry set, followed by 2.5 ppm 2,4-D in the former case and 20 ppm GA in the later. In both the cultivars increase in the concentration of NAA, 2,4-D and 2,4,5-T resulted in corresponding reduction in berry set. Specially 10 and 20 ppm 2,4-D and 20 ppm 2,4,5-T proved highly toxic.

INTRODUCTION

AMONG the manifold problems in cultivation of grape, low fruit set is also important. Poor fruit setting results in considerable reduction in yield which affact the profit of the fruit grower adversely. It is therefore, necessary to devise means of improving fruit set. Recently, sprays of plant growth regulators have been found to improve the fruit set in many species. However, information in this respect on grape is meagre. Therefore, this study was conducted at Rajasthan college of Agriculture, Udaipur during 1970-71.

METHODS

An investigation connected with fruit set in relation to application of following plant—growth regulators in Thompson seedless and *Anab-e-shahi* varieties of grape was taken up.

1. Gibberellic acid (GA) 10,20 and 40 ppm.

2. Naphtheleneacetic acid (NAA) 10,20 and 40 ppm.

3. 2,4—Dichlorophenoxyacetic acid (2,4—D)—2.5,5,7.5,10 and 20 ppm.

4. 2, 4, 5—Trichlorophenoxyacetic acid (2, 4, 5,—T) 2.5,5,7.5,10 and 20 ppm.

Four clusters of uniform size were selected in each treatment. There were 17 treatments including control with three replications. The clusters were dipped in the solution of different plant

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growth regulators for 10 seconds when 20 to 25 per cent flowers had opened. The total number or flowers were counted in each unit before spraying. The fruit set was recorded 21 days after spraying.

RESULTS AND DISCUSSION

From the data in Table 1 it is seen that berry set in Thompson seedless grape was significantly increased by the application of 20 ppm GA. The lowest concentration of 2.5 ppm 2,4—D,

TABLE—1

Effect of Plant growth regulators on fruit set in grape.

Treatment		*Thompson seedless*		*Anab-e-shahi*	
		Fruit set (%)	*Increased (+) or decrease (—) over control* %	*Fruit set* (%)	*Increased (+) or decrease (—) over control* (%)
GA	10ppm	36.41	32.79(+)	46.49	72.37(+)
,,	20ppm	41.94	52.95(+)	43.27	60.44(+)
,,	40ppm	26.08	4.88(—)	32.68	21.17(+)
NAA	10ppm	33.31	21.48(+)	33.48	24.13(+)
,,	20ppm	31.35	14.33(+)	31.17	15.55(—)
,,	40ppm	16.46	39.99(—)	24.18	10.34(—)
2,4—D	2.5ppm	36.87	34.46(+)	25.69	4.74(—)
	5ppm	14.84	45.88(—)	7.57	71.93(—)
	7.5ppm	12.70	53.68(—)	5.49	79.64(—)
	10ppm	0.0	100.00(—)	2.31	91.43(—)
	20ppm	0.0	100.00(—)	0.0	100.00(—)
2,4,5—T	2.5.ppm	25.68	6.34(—)	23.96	11.16(—)
	5ppm	10.81	60.57(—)	11.61	56.95(—)
	7.5ppm	4.79	82.53(—)	5.68	78.94(—)
	10ppm	1.96	92.85(—)	2.75	89.80(—)
	20ppm	0.0	100.00(—)	0.0	100.00(—)
Control		27.42		26.97	
S.E.		3.93		3.00	

10 ppm NAA and 10 ppm GA also increased the berry set considerably. Krishnamurthy, Randhawa and Singh (1959) reported increased berry set in Pusa seedless grape by the application of 10 and 25 ppm GA. Polyak (1960) reported similar results with number of varieties of grape. Application of highest concentration of GA (40 ppm) and NAA (40 ppm) proved toxic and gave remarkable decrease in fruit set, thus lower concentration of above growth regulators proved more beneficial than higher. In the earlir

studies, Krishnamurthy, *et al* (1959) observed that application of 50 ppm GA to Pusa seedless vines resulted in marked reduction in berry set. The percentage berry set decreased progressively with every increase in the concentration of 2,4—D, 2,4,5—T, and NAA. It showed that higher concentration of 10 and 20 ppm 2,4—D, 20 ppm 2,4,5—T and 40 ppm NAA proved highly toxic and the toxic effects were exhibited in terms of appearance of brown to black clusters and berry shedding.

In *Anab-e-shahi*, GA 10 and 20 ppm improved the berry set and the results were highly significant. NAA at 10 and 20 ppm concentrations also increased the berry set markedly over control. An increase in berry set by 10 and 20 ppm GA in Pusa seedless grape has, however, been reported by Krishnamurthy, *et al* (1959). The present findings reveal that percentage berry set decreased progressively with the increasing concentration of GA, NAA, 2,4—D and 2,4,5—T and that their higher concentrations under observation had a toxic effect on berry set. Venkataratnam (1964) in *Anab-e-shahi* and Lynn and Jensen (1966) in Thompson seedless obtained a marked reduction in berry set by spraying the clusters with 25 to 100 ppm GA. The adverse effect of 2,4—D sprays on berry set has been reported by Jones (1955).

The percentage decrease in berry set at higher concentrations of GA and and NAA in general and under all the treatments of 2,4—D and 2,4,5—T excluding 2.5 ppm 2,4—D was possibly due to their thinning effect. This confirms the earlier reports of Krishnamurthy, *et al* (1959) with GA and Jones (1955) with 2,4—D in grape and Leopold (1954) with NAA in apple and other temperate fruits.

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