

**INDUCED SEEDLESSNESS IN GRAPES DUE TO
DEFOLIATION OF SHOOTS ***

Substantial evidences are available in literature on the influence of the leaves on fruit-set, development and quality of berries in grapes (Coombe 1959; Coombe 1962). The physiological bases of the observed effects of defoliation have not yet been adequately explained. Studies conducted by Hale and Weaver (1962) showed that the translocation of photosynthates from the leaves to the developing clusters and berries in grapes depended upon the stage of development of leaves on the shoots.

In a study conducted on the defoliation of shoots in grapes at the Agricultural

College and Research Institute, Coimbatore, it was found that the bunches borne on defoliated shoots produced large number of seedless berries. Studies were conducted on five seeded varieties viz; Anab-e-Shahi, Bangalore Blue, Black Prince, Muscat and Habshi. The extent of defoliation tried were, (1) total defoliation of shoots, (2) removal of leaves below the cluster, (3) removal of leaves above the cluster and (4) control- no defoliation. The defoliation was done at pre-bloom (4 to 5 days prior to full bloom).

The percentage of seedless berries produced per bunch in the varieties tested are given in Table 1.

TABLE 1

Induced seedlessness in grapes due to defoliation of shoots

Treatments	Per cent seedless berries				
	Anab-e-Shahi	Bangalore Blue	Black Prince	Muscat	Habshi
Total defoliation	5.6	16.6	48.5	54.4	89.6
Leaves below the clusters removed	4.6	10.1	40.8	53.7	59.3
Leaves above the clusters removed	0.4	3.8	11.9	19.5	8.2
Control	0.0	2.7	5.1	17.5	5.9

* From Ph. D. thesis submitted to Madras University in 1965.

Defoliation is found to induce seedlessness in all the varieties tested, although the degree of the same depends upon the type of defoliation and the varieties concerned. In the variety Habsbi 89.5 per cent seedless berries are produced per bunch on total defoliation of the shoots. A few bunches in this variety have become completely seedless. In such cases the shape of the berries and the nature of the bunches are completely changed. The long and cylindrical berries of Habsbi are transformed to round and small on becoming seedless. In the matter of production of seedless berries, total defoliation and removal of leaves below the cluster had more or less the same effect. The results are of interest from the point of developmental physiology of fruits, especially in the studies on translocation of photosynthates from the leaves.

The seedless berries contain soft "stenospermocarpic" seeds, thus indicating that it is not the fertilization that is affected but the later development of the seeds. Olmo (1946) found that stenospermocarpic seed production in grapes was due to seed abortion. Tukey (1933) attributed embryo abortion in cherries to nutritional factors.

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It is possible that apart from the restricted food supply the supply of growth factors (gibberellins and auxin precursors?) to the developing berries are arrested on defoliation of shoots.

References

- Coombe, B G 1959. Fruit-set and development in seeded grape varieties as affected by defoliation, topping, girdling and after treatments. *Amer. J. End, Vitic.*, **10**: 85-100.
1962. The effect of removing leaves, flowers and shoot tips on fruit-set in *Vitis vinifera*, L. *J. hort. Sci.*, **37**: 1-15.
- Hale, C. R. and R. J. Weaver. 1962. The effect of developmental stage on direction of photosynthates in *Vitis vinifera*, L: *Hilgardia*, **33**: 89-131.
- Olmo, H. P. 1946. Correlation between seed and berry development in some seeded varieties of *Vitis vinifera*, L. *Proc. Amer. Soc. Hort. Sci.*, **48**: 291-297.
- Tukey, H. B. 1933. Artificial culture of sweet cherry embryos. *J. Hered.*, **24**: 7-12.

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