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FRUIT GRAFT IN AVOCADO

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The avocado fruit has many characteristics of growth, development and physiology which differ markedly from most deciduous and many of the evergreen tree fruits. The high oil content, unusually high respiratory rate (1), the property of remaining firm until removed from the tree are rather unique among commonly known fruits. Moreover, certain unusual morphological and developmental features distinguish it and explain in part some of its rather unusual physiological behavior (2). Among the latter characteristics is the observation that the fruit grows continuously from flower to maturity by cell division and cell enlargement. Most other fruits undergo a period of cell division for two or three weeks following pollination, after which fruit growth continues primarily as the result of cell enlargement. There is good evidence to indicate that cell division in the avocado fruit is continuous to some degree until the fruit is horticulturally mature or is removed from the tree.

The property of continued cell division in the avocado fruit has provoked a study of the factors which may be associated with this phenomenon. One aspect of the problem has been an investigation of the morphological and cytological responses of the avocado fruit to wounding. Such studies are in progress and will be reported at a later date. Another aspect of this study has involved attempts to graft fruit tissues to gain an understanding of the nature of tissue healing and to prepare materials for other physiological investigations.

The comparatively high meristematic potentiality shown by the avocado fruit pericarp would indicate that such tissue could be induced to proliferate easily and hence would be suitable for grafting experiments. That such is the case is suggested by the results of the present experiment.

The technique involved in the fruit graft has been that of a modified approach graft in which two nearly-mature fruits still attached to the tree were cut in longitudinal, tangential planes such that the two cut surfaces were of approximately the same size and could be matched. The cut surfaces of the two fruits were placed together firmly and held by means of rubber bands. The grafting was done in late February. After a period of approximately six weeks it was noted that the fruits had grown together and were held firmly by new regenerated tissues. Both fruits remained attached to the tree by their stems. The Hass variety was utilized for the present studies. The fruits were approximately 3½ inches long at the beginning of the experiment. Examination under the microscope indicated that actual fusion of tissue had occurred and that continuity of

cells could be traced between the two fruits. The connecting tissue was composed of parenchyma entirely with no evidence of differentiation at the time of examination. Other grafted avocado fruits are under study to learn more of the fate of the individual fruits and to see how extensively their tissues may become united and functional.

While grafting of roots or shoots in various combinations is commonly reported in many plant materials, the union of typical fruit tissue of the avocado by grafting may possibly be unique. The technique may prove very helpful in providing materials for the study of factors which affect fruit growth, the nature of fruit development, and other studies of basic nature.

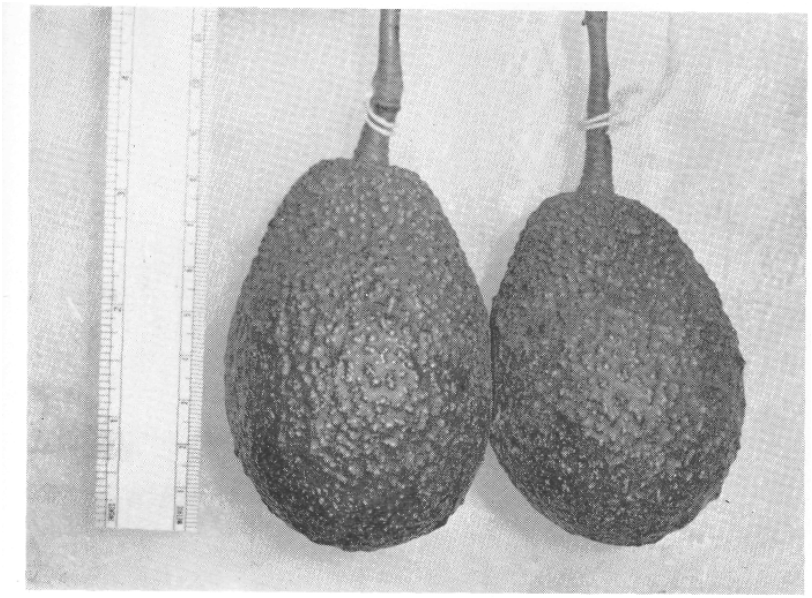

Figure 1. Two nearly mature Hass fruit which have been grafted together.

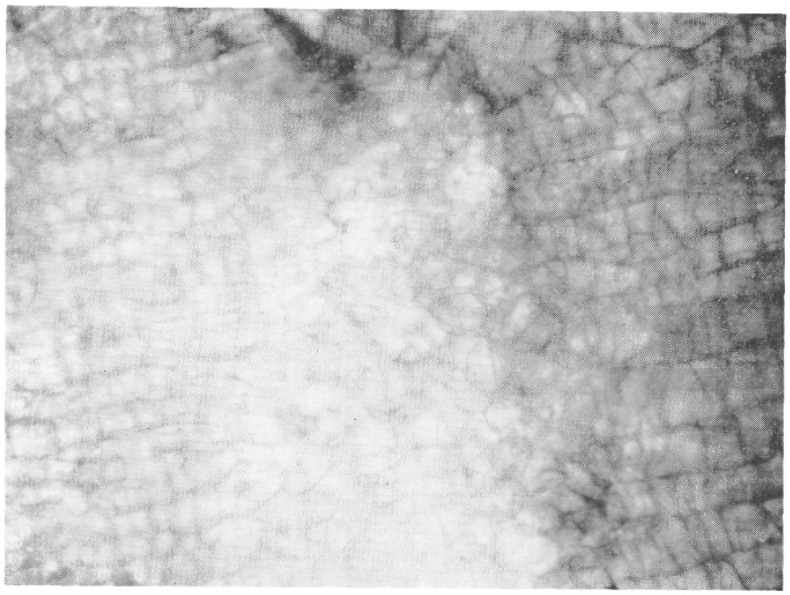

Figure 2. Section through graft union of fruit showing continuity of pericarp tissue.

LITERATURE CITED

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