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A STUDY OF GROWTH IN APRICOT FRUIT

by

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I SUMMARY

A study has been made of growth in the fruit of apricot, cv. Moorpark, in Adelaide, South Australia. Morphological changes in the various tissues which constitute the fruit have been examined during the period from anthesis to maturity. Cell division continued in the mesocarp for approximately 15 days after anthesis; cell expansion continued from anthesis to maturity. Differences in the shape of fruit and of cells in the mesocarp have been related to stage of development and to various treatments imposed on the fruit.

Significant positive relationships have been shown to exist between the size of fruit at early pit-hardening, and that at the end of pit-hardening and at maturity. Large fruit at pit-hardening were also shown to ripen earlier. Fruit were shown to vary in size and in the number and volume of mesocarp cells, both within and between trees. Size differences in fruit within a tree were mainly due to differences in cell number, but between trees the contribution of cell number was less and cell size was relatively more important than within trees.

Factors have been tested for their effect upon fruit growth, and response has been measured in terms of fruit volume, cell number and volume in the mesocarp, and endogenous gibberellin.

Thinning flowers at full-bloom increased slightly the size of fruit at maturity, but no difference in size, cell number or cell volume could be detected at pit-hardening.

In 1961 fruit from blossoms which flowered early grew at a

slower rate than from blossoms which flowered late. It is suggested that the slower growth was due to the cooler conditions under which the former fruit developed. Application of heat to apricot branches at night for the first 10 days after anthesis increased the initial growth rate of fruit and of cells in the mesocarp, and produced more rapid cell division in this tissue. It did not affect final fruit size or the number and volume of cells in the mesocarp. No differences in the level of endogenous gibberellin in fruit tissues were produced by heat treatment.

Gibberellic acid injected into apricot branches, at or before full-bloom, increased early growth rate of fruit but subsequently depressed growth and final size. Cell numbers in fruit from treated branches were significantly lower than controls. The level of endogenous gibberellin in fruit tissues was not affected by gibberellic acid application.

Endogenous gibberellin was estimated using the barley endosperm test. There was a positive relationship between growth rate of seed, endocarp, and mesocarp and the level of gibberellin found in crude extracts of these tissues. An hypothesis is suggested to explain the role of gibberellin in apricots. Using a partitioning procedure and paper chromatography some properties of this gibberellin were obtained and are discussed. Only one zone of activity was recovered on paper chromatograms and this ran at an Rf of 0.28 in isopropanol: ammonia:water (10:1:1). The compound is non-basic and more polar than gibberellic acid, but it does not resemble any of the known gibberellins.