

Summer Squash Harvest Time

growth rates and chemical composition of fruits of four varieties studied to determine optimum harvest time

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Growth rate and chemical composition studies of summer squash should help growers to determine the frequency of harvest, and nutritionists to learn more about the relationship of maturity to quality and food value.

Such studies were made of the summer squash varieties—Early Prolific Straightneck, White Bush Scallop, Black Zucchini, and Early Summer Straightneck.

Fruits grown at Davis on Yolo fine sandy loam soil were sampled first on the day of full bloom and then on each of the following 10 days.

Black Zucchini had the fastest growth rate, followed in order by White Bush Scallop, Early Prolific, and Summer Crookneck.

Fruits of 100 grams are about the minimum in the commercial harvest of any of the varieties. Zucchini fruits reached this size on the third day after blooming, White Bush Scallop and Early Prolific on the fourth, and Summer Crookneck fruits not until the sixth day. After the fourth day there was a very rapid rise in the growth rate of Zucchini fruits.

Varieties Compared

In California it is customary to harvest the fruits early and usually before a size of 300 grams is attained. If fruits weighing between 100 and 300 grams are considered as being acceptable for market then this allows a maximum of two days between harvests for the Zucchini variety, about three days each for White Bush Scallop and Early Prolific and approximately four days for Summer Crookneck.

In later stages of growth the fruits become unacceptable for table use. The flesh becomes stringy and watery, the seeds enlarged and hardened. By these standards fruits of the Zucchini variety were inedible seven days after full bloom, as compared to eight days for Bush Scallop and nine days for Early Prolific and over 10 days for Summer Crookneck.

The studies of chemical changes during the growth of the fruits showed that alcohol-insoluble solids and reducing sugars made up the greater portion of the dry matter of fruits of all varieties. Fructose accounted for approximately one half of the reducing sugars.

In the Zucchini variety there was a gradual decrease in alcohol-insoluble solids from over 4% on the date of blooming to about 1.5% in the nine-day fruits. Reducing sugars increased from less than 1% to over 2% in nine days, with the greatest increase occurring during the first six days after bloom. Starch was fairly constant during the nine-day growth period, remaining slightly over 5%. Sucrose was very low during the entire growth period.

In the Early Prolific alcohol-insoluble solids decreased about half during the first six days and then remained almost constant. Starch was at a maximum in full bloom fruits and decreased gradually until the tenth day when it was approximately half of the original content. Reducing sugars increased markedly for the first four days after the fruit set and then remained fairly constant for the next six days.

In the White Bush Scallop most chemical changes closely paralleled those of Early Prolific. The main difference was that starch increased up to about the fourth day after anthesis and then decreased for the next six days.

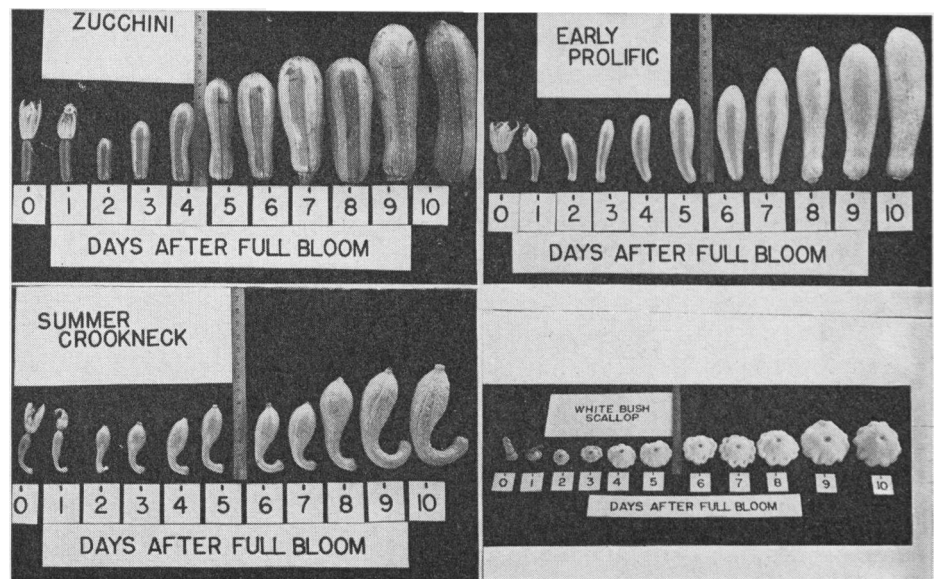
In the Summer Crookneck alcohol-insoluble solids were higher initially than in the other varieties and showed only a

very slight decrease throughout the ten-day growth period. Reducing sugars and fructose showed a gradual increase and were about twice as high in ten-day fruits as in those just blooming.

At full bloom fruits of all varieties had a total solids content of approximately 8%, with Summer Crookneck in the top position. During the ten-day growth period, total solids decreased slowly to about 7.5% in Summer Crookneck. In the other varieties the decrease in solids was regular and much greater. Ten days after blooming, fruits of the Early Prolific and White Bush Scallop contained about 5.5% total solids while Zucchini contained only 5%. When prime fruits are considered—three to six days after bloom—those of Summer Crookneck were the highest in total solids followed in order by Bush Scallop, Early Prolific, and Zucchini.

Alcohol-insoluble solids followed the same general trends in the various varieties as did total solids. In the Summer Crookneck variety alcohol-insoluble solids showed only a slight decrease with maturity of the fruit but in the other varieties they decreased fairly gradually during the ten-day period to about one half of the original content.

Continued on page 12



Photographs of fruits representing the weight categories of fruits of the tested varieties. Fruits of White Bush Scallop are reduced to approximately one half of the magnification of the other varieties.

COOKER

Continued from page 3

obtained. Such sirups may be profitably used by returning them to the canned pears.

The pilot apparatus used in these preliminary experiments was three feet high, one foot in diameter and built of a three millimeter thick glass lined steel. It is important that the whole column should end with a smooth and gradual cone.

If the bottom of the heating chamber is straight or only rounded there will be created a considerable obstruction to the material blown out. This will result in the steam forcing a passage out and leaving a considerable part of the fruit in the cylinder.

The quick opening valve at the bottom should be proportionally wide enough to let through the entire mass as fast and as freely as possible. The bottom valve in the laboratory pilot plant used was 1½ inches in diameter, but for large scale equipment at least three to four inch valves should be used.

A wide grid in the form of a cross should be inserted at the bottom of the conical apparatus just above the outlet

to prevent whole fruit from clogging the valve.

Grids or screen with small holes are inadequate because the outer skin of the tomato is so strong it would prevent the mass from passing through during the blow-out operation.

Further Studies Needed

Further detailed study is required on the application of this method in the processing of various fruits and agricultural waste material; the control of conditions; and, the value of the resulting products.

Some of the specific problems to be studied in connection with this method are:

1. The influence of the high temperature used on the retention and preservation of color and vitamin C.
2. The degree of inactivation of the pectic enzymes as well as the viscosity of the final products.
3. The degree of sterilization attained by this method.

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SHEEP

Continued from page 2

home and abroad have aided in the upward price movement. The outlook for wool prices at home and abroad is that they will continue to be firm. An added factor in their strength will be rearmament as servicemen require several times the amount of wool normally used by a civilian.

As with lamb, wool prices at present are within the range of authority for control. The substitution of other fibers, especially synthetics, has increased since the close of the war. Undoubtedly part of this has come through price relationships.

The present differentials in prices will tend to encourage an increase in the substitution of synthetic fibers for wool—wherever and whenever this can be done.

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A more complete report of the sheep and wool situation—Sheep and Wool Situation in California 1950, by Edwin C. Voorhies—Exp. Sta. Cir. 399, may be obtained by writing to the Publications Office, 22 Giannini Hall, University of California, Berkeley 4, California.

SQUASH

Continued from page 6

Starch generally accounted for slightly over one third of the alcohol-insoluble solids. In the Summer Crookneck variety it increased for about the first eight days and then decreased. In the other varieties there was a tendency for starch to remain constant for the first few days and then to decrease. When the fruits were in the best edible state, those of Summer Crookneck were the highest in starch followed in order by Bush Scallop, Early Prolific, and Black Zucchini.

All varieties were similar in sugar content and reducing sugars were dominant. There was a marked increase in sugar during the four days after bloom and then a gradual leveling off for the next six days. During the period of prime edibility fruit of White Bush Scallop had the highest sugar content and Summer Crookneck and Zucchini the lowest.

Taking the Early Prolific variety as an example, fruits on the fifth day after bloom, when they are considered as of prime market condition, had slightly over 6% total solids, nearly 3% alcohol-insoluble solids, slightly over 2% reducing sugars, about 1% fructose, and about .2% sucrose.

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Average growth rate of fruits of four varieties of summer squash.

