among the best. Hardier than these and more satisfactory are hybrids between *Corylus americana* and C. *Avellana*. Some of these, known as the Jones Hybrids, are worth trying. Bixby and Buchanan are two kinds coming from this cross. The Geneva Experiment Station has raised many thousands of seedlings and have a few clones which they are recommending for trial. Japanese heartnuts may be worth trying but as yet the varieties have not been sufficiently well tested to make recommendations.

The whole matter of varieties for northern nut growing is in the testing stage, and, at the present time, anyone who plants nut trees is, to a certain extent, an experimenter.

Shagbark hickory — Kentucky variety, has matured well-filled nuts at Ithaca, N. Y.

Peach Varieties in Central Washington

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In Washington peaches are grown commercially in two basically different environments, namely the semi-arid Central section and humid Western region. The largest percentage of the state's peach crop is produced in Central Washington, and this article will deal only with this important area.

Practically all peaches in the central part of the state are grown under irrigation. The altitude varies from about 300 to 2000 feet above sea level. In some cases a difference of 1500 feet in elevation occurs within the distance of a few miles. In general, differences in ripening season of peaches in Central Washington are more closely related to altitude than to latitude. This has an important bearing on the variety situation since it enables producers in a limited area to spread the ripening season over a longer period with a given variety.

Production Increasing Steadily

Peach production in Washington has increased quite consistently since 1939. The average production for the five-year period 1941 to 1945 was considerably over two million bushels per year. With newly developing irrigation projects near established peach sections, there is every

indication that production will continue to increase for some time. Undoubtedly part of this increase will be absorbed by the fresh market but the bulk of it will be dependent upon processing outlets.

Utilization of Washington Peaches

It may be of interest to note the utilization of the Washington peach crop for the years 1942, 1943 and 1944, the latest years for which comparable data are available. In those years 70 per cent of the crop was sold on the fresh market. During the same years about 24 per cent of the crop was canned while about six per cent was frozen, making a total of 30 per cent of the crop processed. The exact distribution of the fresh market portion of the crop is difficult to ascertain. Twenty per cent of the total crop was shipped out by rail. At present, practically all rail shipments from this state go east of the Rocky Mountains, the bulk of them to the Plains States or beyond. The remaining 50 per cent of the crop which was sold on the fresh market was shipped by truck. The largest portion of this undoubtedly went to the markets on the Pacific Coast, a distance of several hundred miles. In addition, substantial shipments by truck go inland as far east as Minnesota. Only a minor portion of the total crop is sold through local roadside markets.

This brief outline of the utilization of the Washington peach crop indicates some of the major points which must be considered in the choice of varieties. As a result of past experience, most growers are not interested in substantial plantings of any variety having only one market outlet. There is, of course, a limited local market for early dessert varieties which can be trucked up to several hundred miles. Aside from this, and major variety should be suitable for both long distance shipping and processing as canned or frozen pack peaches. The present commercial outlets in this state are limited to yellow-flashed, freestone peaches. It is doubtful whether Washington growers could or would want to grow clingstone peaches in competition with other established clingstone peach sections.

Elberta and J. H. Hale Most Important

The major commercial varieties of peaches grown in Central Washington are Elberta and J. H. Hale. Their dominance in this area may be attributed largely to their suitability for long distance shipment and processing and to their recognition and acceptance on the market. The Elberta also maintains it position because of its productivity while the quality and appearance of J. H. Hale compensate for its low yields and increased cost of production. Of these two varieties, the Elberta accounts for by far the greatest tonnage and acreage although few orchards do not have a good percentage of J. H. Hale. Elberta is grown extensively as a fresh market peach for the local or Northwest market, as well as for the markets in the Central States. In addition it is used almost exclusively for canned free-stone peaches and to a lesser extent for freezing preservation. J. H. Hale on the other hand is used extensively for fresh market and for freezing. Excessive red flesh pigment almost excludes the J. H. Hale variety from commercial canning.

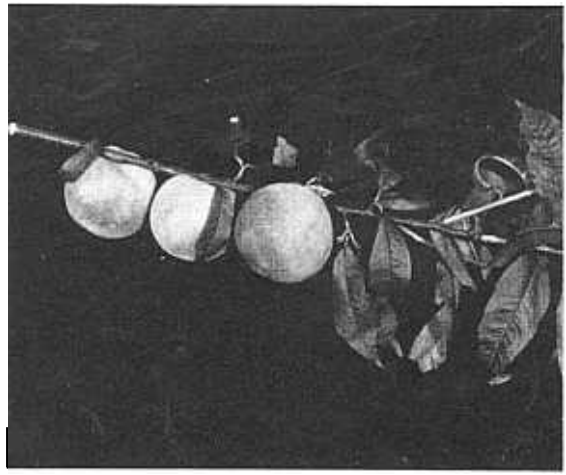
Varieties of Minor Importance

Several other varieties are grown to some extent. Of these Early Elberta (Gleason's) probably leads the list in trees planted, and the planting of this variety is on the increase. Early Elberta is very well liked by commercial canners and freezers. Aside from giving an excellent pack, it also handles well in the cannery and lengthens the canning season by ripening a week to ten days before Elberta.

The Redelberta, which originated locally as a bud sport of Elberta, was widely planted at one time but its production and size did not measure up to its parent variety. Under certain conditions of soil and management Redelberta seems to do very well and is favored because of its attractive appearance and the fact that it matures about ten days before Elberta.

Golden Jubilee was likewise planted quite extensively at one time but has been largely removed because of its poor ripening characteristics, and is being planted only to a very limited extent.

Gold Medal is an excellent variety for the fresh market, canning, and freezing preservation but unfortunately it ripens with Elberta and consequently has never attained the eminent position which it deserves. Few would question its superiority to Elberta as a dessert, shipping, canning, or freezing peach. With ordinary care this variety is about as productive as Elberta, but it will not produce as well under neglect as the Elberta does. Incidentally, Gold Medal and Fay Elberta are reported by some to be the same variety but trials at this Station show that although similar in fruit, there is a distinct difference in blossom type between authentic Gold Medal and the Fay Elberta obtained from a reliable nursery in California.



Halehaven, an introduction of the Michigan Experiment Station which is rapidly becoming the leading peach variety in many regions.

Halehaven

Halehaven should be mentioned not only because of its importance but also to illustrate the limitations of many new varieties for Central Washington. While this peach is now a major variety in some peach growing sections, it is not likely that it will become a major variety in Central Washington. Although it is an excellent dessert peach, it lacks the firmness required in a shipping peach and the texture and freedom from stringiness for a canning freestone. Those which are grown here are limited to fresh markets within a distance of several hundred miles. Essentially the same may be said

for Redhaven although it does not have competition from other quality peaches as does Halehaven. Thus the extent to which both these varieties can be grown is limited to the relatively small Northwest fresh market.

Rochester and Slappy practically complete the list of commercial varieties in this area although a few others are found on the local markets in insignificant quantities.

Peach Variety Testing

Peach variety testing has been in progress at the Irrigation Branch Experiment Station in the lower Yakima Valley since 1922 but it was not until 1937 that a thorough testing program was begun. Emphasis is being placed on high quality canning and freezing yellow-fleshed freestone peach varieties of the Elberta season or those about two weeks earlier or later in ripening. In addition, fresh market varieties from the earliest sorts to those ripening on through the season are being tested. There is little interest in white-fleshed or clingstone varieties.

At present this Station has about 120 varieties of peaches fruiting. In addition, a new variety orchard was started in 1946 under the Roza irrigation project. This latter is a considerably larger variety planting and includes many newer varities as well as numbered selections developed by various Stations engaged in peach breeding in other parts of the country. This planting also includes strains of commercially important varieties.

Comments on New Varieties

A few comments on the status of some of the relatively new varieties may be of interest.

Fisher is about the earliest variety having acceptable quality. Being a semi-cling and ripening from the surface toward the pit, it can hardly be considered for commercial planting.

Redhaven is one of the earliest varieties tested which has real commercial promise. As stated previously, it has a somewhat limited market but its quality and attractive appearance place it foremost among very early peaches. Like any very early peach, it requires early and careful thinning to assure good size. In contrast to many of the extreme early varieties, Redhaven is a credit to the peach industry.

Triogem has some excellent characteristics but may be a little too fibrous for its season. It is not quite early enough to escape competition from varieties having better flesh characteristics. This variety has not been grown long enough to determine whether or not it will find a place in our industry. Goldeneast has about the same status as Triogem although a few of these have been planted commercially.

Sunhigh appears to be quite promising but has not been tested at this Station long enough for proper evaluation. Herbhale, a new local variety of the Sunhigh season has been quite promising. July Elberta, of about the same season, is winning friends among commercial growers and will probably continue to give strong competition to any new variety of its season.

While other new varieties and selections are under trial, it is obvious that there is room for much improvement in peach varieties for this area. In fact, every variety now grown commercially or under trial has at least one serious weakness which limits its usefulness.

Strawberry Breeding

By The U. S. Department of Agriculture

By George M. Darrow,

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The objectives of the strawberry breeding work are to reduce the economic hazards of the grower and to obtain varieties better adapted to specific uses. The losses to growers that breeding might help to lessen are chiefly those which are the result of injury by disease, drought and cold.

Resistance to leaf scorch, leaf spot, red stele root disease, and virus diseases have been obtained through the use of varieties and species. Howard 17 (*Premier*) has been a good source of resistance to leaf spot and leaf scorch, though at the present time a strain of the leaf spot fungus seems to attack it severely in some locations. Red stele resistance has been obtained from Aberdeen and from importations from Scotland. Virus resistance has been obtained from Blakemore, probably through its Howard 17 parent.

Increased firmness has been obtained from Missionary and higher dessert quality from Royal Sovereign, Fairfax, Marshall, Euresko, Ettersbug 80, and a combination of Howard 17 and Missionary. Finer preserving varieties have been secured by crossing Howard 17 x Mission-