Successful Dehydration

clingstone peaches can be dried successfully

Clingstone peaches can be dehydrated successfully—producing a dried fruit that has attractive appearance and pleasing flavor.

Any of the canning clings may be dehydrated, but the midsummer varieties are preferable to the Tuscan, Phillips, and Levi. Both halved and uncut clings can be dehydrated, but the former are preferred.

Peeling and steam blanching of the fruit are important in the process of dehydrating clings.

Unpeeled clings can be dehydrated, but the skins are so tough they lower the appearance and taste of the dried product.

Blanching greatly reduces the total time required for dehydration and produces a superior grade of dried fruit, deep orange in color, translucent, and very acceptable. Such fruit takes only one or two hours of soaking to return moisture when it is to be cooked, in contrast to about 16 hours of soaking necessary for unblanched dehydrated clings.

Clings are easily bruised during harvesting and should be picked carefully by hand; never shaken from the tree. Underripe peaches have a high shrinkage rate and yield off-color, shriveled dehydrated pieces. Only suitably ripe fruit should be picked for dehydrating.

The fresh fruit should be size-graded when it is received at the plant. At least two sizes should be maintained: large, of 2½ inches or over in diameter; small, or under 2½ inches.

Grading will favor an even steam penetration in blanching and uniform dehydration.

The peaches can be cut and pitted by hand, but it is considered more economical to use machinery.

Because of their firm flesh, cut halves of clings can be handled on conveyor belts or in lug boxes, and can even be stored for a short time when it is desired to accumulate enough cut fruit to keep the dehydration process going continuously for a specified period. Storage should not be so long that browning will take place.

Pits average 13.5% of the whole weight of clings. They have little or no present commercial value except as fuel; should be kept clean and dried quickly in the sun if so used; hauled from the plant if not used, and covered thoroughly with chlorinated lime to prevent probable insect propagation.

Peeling and Washing

The halved peaches may be peeled by passing them through a hot lye solution.

The solution should be kept close to the boiling point, with a concentration of about eight to 21 pounds of lye per 100 gallons of water—or 1⅓ to four ounces of lye per gallon of water.

Lye concentration will fluctuate in the solution and should be checked about every 30 minutes to an hour, by examining the condition of the peeled fruit. If bits of skin are found sticking to the peaches, either the solution is too weak or immersion time too short. When skins are hard to remove, the lye strength in the solution may be increased.

Too much lye, or too long a dipping period, will result in roughening of the peeled surfaces. Overdipping results in loss of fruit weight.

The lye solution can be washed off by using heavy sprays of cold water in a rotary drum.

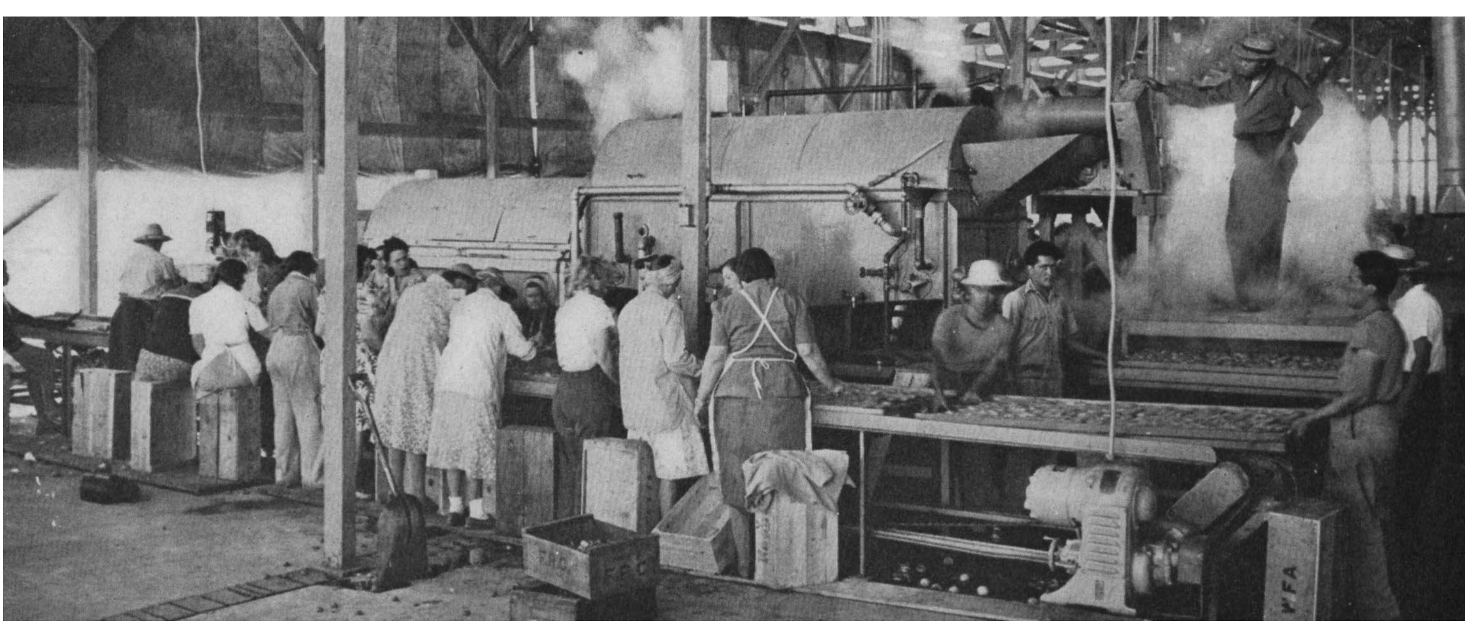
Care should be taken to remove completely the lye from the pit cavities of the fruit. If allowed to remain, it will cause discoloration in the dried product.

A method of testing whether lye remains is to place, with an eye-dropper, about three or four drops of 1% alcoholic solution of phenolphthalein—obtainable at most drug stores—into the pit cavities of some of the washed fruit. This colorless solution will turn bright red if lye is still in the fruit—indicating that it must be rewashed.

Approximate time schedule for dehy

Clings	Blanching	Sulfurin
Halved fruit	9 to 16 minutes	3 hours
Whole fruit	15 to 25 minutes	3 to 4 hours

Dehydration equipment: peeler—*center*, washer—*left*, and trays entering blancher—*right*.



# of Clingstone Peaches

when proper procedure is followed carefully

Herman J. Phaff and Emil M. Mrak

drating clings: minimum drying ratios.

Dehydrating	Over-all drying ratio
12–16 hours	9+: 1
20 hours or longer	4: 1

The washed fruit should be spread cup side up on 3 × 6-foot wooden trays. Each tray will hold about 45 pounds of fruit.

Blanching

The trayed fruit can be steam-blanched in either a continuous conveyor or a cabinet-type blancher.

In the conveyor-type blancher the trays move slowly through the blancher under steam pressure introduced from a boiler.

In the cabinet-type blancher—which resembles a sulfuring house in construction with a steam inlet pipe lengthwise along the ceiling—the trayed fruit on a car remains stationary during the steaming.

In a conveyor blancher it will take about nine to 12 minutes to blanch the fruit, varying with the size and variety. In the cabinet, it will take about 16 minutes to heat the fruit thoroughly. Phillips and Levis require slightly more time.

It is difficult to inspect the heat penetration in freshly blanched fruit. The best way is to examine the dried fruit which will show straw yellow, nontransparent areas. Properly blanched fruit will show no such opaque areas.

The fruit should be steamed through about two thirds of the way; heat penetration will be completed after the fruit is taken from the blancher and left on stacked trays.

Sulfuring

Blanched fruit must be cooled to about 120° F or less before it is sulfured. If this is not done the sulfur dioxide—SO_2—absorption will be poor and the fruit may come out undersulfured.

Cooling may be quickened by placing the cars of hot fruit from the blancher into an empty dehydrating tunnel for about 10 minutes—with the blower fan operating with the heat turned off. If no tunnel is available, the cars can be placed in a natural or an artificial draft to hurry the cooling.

The fruit should be sulfured about three hours—burning three pounds of good, clean sulfur per single car holding from 20 to 25 trays.

The sulfuring house should be tightly constructed, but properly air vented.

Dehydration

After sulfuring the trayed fruit should be run into the dehydrater as quickly as possible.

Average drying time for halved clings is only 14 hours, as blanched, peeled clings release their moisture quite rapidly because of their large evaporating surface.

A maximum finishing temperature of 160° F can safely be applied to clings—provided the fruit is not dried to a moisture content lower than 25%. The percentage may be determined by the use of a moisture tester.

In a dehydrater tunnel with an average airflow—about 750 linear feet per minute—usually not more than 10 to 12 single cars can be present without raising the humidity too high, or to a point where drying is slowed and the sulfur dioxide content lost from the fruit.

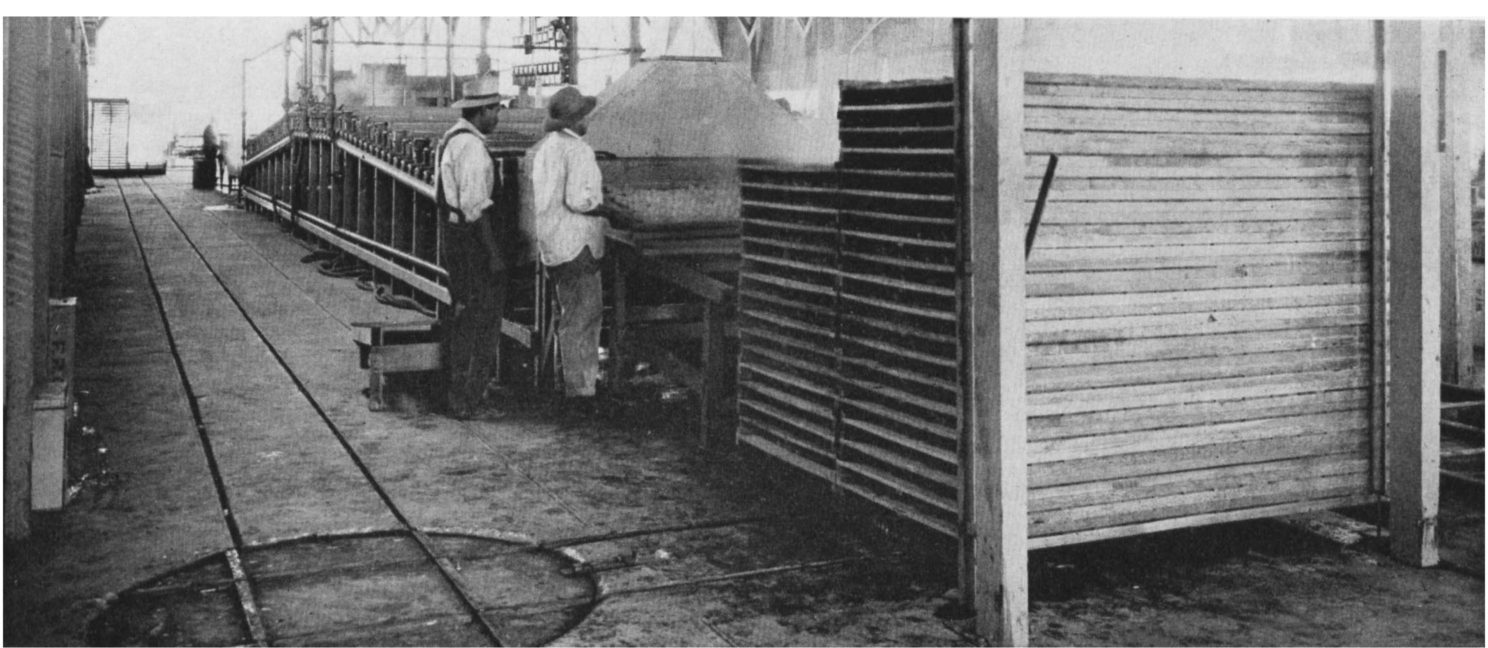
Proper timing of intervals between the placing of successive cars in at the cool—wet—end of the tunnel is important. The careful operator can thus shorten drying time and obtain a superior product.

If a tunnel dehydrater is used, there should be two dry-bulb thermometers—one at each end—and one wet-bulb thermometer so placed as to be in the direct high-speed airflow. These will show the dehydrater temperatures and humidity. A properly placed wet-bulb thermometer will read the same, irrespective of its position along the inside of the tunnel.

The difference in readings of the wet-and dry-bulb thermometers should be 15° or more at the wet end of the tunnel. A simple way to find out if the exhaust air

Continued on page 14

Opposite end of plant at the left showing trays emerging from a hunchback-type conveyor.



PHOSPHATE

Continued from page 11

concentrations greater than 0.50 ppm deficiency is unlikely to occur—only two out of 30 soils gave a response.

In the light of field and greenhouse results, the following ranges of phosphate in water extract are suggested for tentatively defining the status of available phosphorus in a given soil.

Class *1*. Response likely, less than 0.30 parts per million of phosphate.

Class *2*. Response uncertain, from 0.30 to 0.50 parts per million of phosphate.

Class *3*. Response unlikely, greater than 0.50 parts per million of phosphate. It must be emphasized that these ranges of phosphate are expressed on the solution basis.

An anticipated response to phosphate fertilization implies that only phosphorus is the limiting element and that there exists no toxic condition in the soil. In California often nitrogen must be added to secure a phosphate response.

In the case of a phosphorus-deficient soil, response can be expected only when sufficient amounts of phosphate have been added. In the case of a soil containing minerals of the kaolinite type, fixation would be great. This would require considerably more phosphate for a response or a banding of the fertilizer in the immediate vicinity of the roots.

The ranges of phosphate suggested for interpretation of the chemical extraction apply only to the crops listed, mainly pastures, field crops and truck crops.

Field experiments suggest that these responses are especially pronounced for winter crops.

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The above progress report is based on Research Project No. 1157.

CLINGS

Continued from page 9

is becoming moist is to compare the thermometer readings.

Because of the large trimming losses—pits and peel—the over-all drying ratio is less favorable than for other fruit. A good quality fruit dries about 9:1 and a higher ratio is found for orchard run lots.

To complete the reduction of moisture content to about 20%, the fruit is removed from the dehydrater and allowed to stand for several hours.

In foggy climates this plan can not be followed, for standing fruit might actually absorb additional moisture from the air. In such places, the temperature at the finishing end of the tunnel is reduced to about 150° F and the drying finally completed while the fruit is still in the tunnel.

The cooled fruit is removed from the trays to clean, wooden boxes for temporary storage before shipping.

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CITRUS

Continued from page 10

aration of 500 gallons of 2,4-D spray are given in the accompanying table.

Experimentally the spray has been applied as a complete coverage spray of from 15 to 20 gallons per tree to as little as about six gallons per tree. Applications of four gallons per tree or less do not appear to be satisfactory at the concentrations listed. It seems reasonable to expect that spray-dusters, boom sprayers, or other equipment applying at least six gallons per tree of the 2,4-D sprays listed, would be satisfactory.

Much more information is needed on application methods before more than these tentative conclusions may be drawn.

Inasmuch as 2,4-D used to reduce mature fruit drop has been found to be compatible with the usual spray chemicals, it seems likely that when used at somewhat higher concentrations for fruit size increase it will likewise be compatible.

When applying 2,4-D, it seems desirable to reduce the curling of the new young leaves by delaying application until after the spring leaf growth has occurred. In some trials, although leaf curling has been severe, it has not reduced production of fruit quality. Succeeding leaf growth flushes usually have appeared normal.

Spraying Valencia oranges and grapefruit with 2,4-D to increase fruit size of next season's crop has not been found to increase fruit size of the current, mature crop. It will, however, effectively reduce mature fruit-drop of the current crop.

Trials are now in progress to compare 2,4-D with 2,4,5-T (2,4,5-trichlorophenoxyacetic acid) and other chlorinated phenoxy acids for effectiveness in increasing fruit size. Preliminary data indicate that 2,4,5-T is at least as effective as 2,4-D.

The over-all effect of 2,4-D sprays to increase citrus fruit size seems to be an accentuation of the juvenile characteristics of the fruit. This includes large fruit size, delayed maturity, dark green young fruit; somewhat rough, pebbly rind to maturity; and thick fruit-stems.

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SPINACH

Continued from preceding page

trace of fungus penetration or development. The freedom from disease, then, can be considered to be true immunity, rather than high-level resistance.

The consistent reaction of the immune stocks during the winters of 1947–48 and 1948–49, have not suggested the presence of any physiologic strains of the fungus in the Davis areas, although there was ample opportunity for infection from natural sources throughout the course of the experiments.

Because of the predominantly dioecious habit of spinach, self-pollination is not normally possible. Inheritance data, therefore, have been secured on the first generation resulting from the cross between immune and susceptible plants and on the first backcross of immune first generation plants to the susceptible types.

The results of these experiments have shown that immunity is simply inherited as a single dominant genetic character. Because of this, it will be possible to transfer to commercial spinach varieties the complete freedom from downy mildew which has been found in the Iranian variety.

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The above progress report is based on Research Project No. 906.

TIMBER

Continued from page 7

Whitaker's Forest is situated in one of the most productive timber types in California. Sugar pine, ponderosa pine and white fir are all important timber trees, and the sequoias here have demonstrated their ability to grow in height and volume at a rate exceeding that of most softwood tree species.

The east portion of the forest above the camp clearing is cooler and somewhat more moist than the west portion and contains a mixed stand of sugar pine, white fir and sequoia with occasional incense cedars and black oaks.

Ponderosa pines appear in greater number towards the west with increase in warmth and dryness and the sequoias drop out of the stand before the west boundary is reached.

From there west on the National Forest there are virtually no sequoias at this elevation. A heavy stand of mature ponderosa pine on the ridge west of the property produced a large volume of timber when cut under National Forest timber sale in 1944 and 1945.

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