

UNIVERSITY OF CALIFORNIA
AGRICULTURAL EXTENSION SERVICE
Stanislaus County

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CLINGSTONE PEACHES

By

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Stanislaus County Clingstone Industry

Stanislaus County is number one in clingstone peach production. As of 1965 it had some 20,650 acres of bearing trees and 3,720 acres of nonbearing trees or 30 per cent of the state's total.

Climate

Clingstone peaches require relatively cool winters (about 1,000 hours below 45 degrees) and warm, dry summers. The Modesto area is blessed with a climate that is ideal for peach production. The dry summer months allow fruit to ripen without much danger of fruit brown rot. The moderately warm temperatures enable growers to produce large tonnages of fruit per acre. The combined winter and summer climatic conditions account for the industry being located in the central valley of California.

Soils

Peaches are best grown on fairly fertile, deep, well-drained soils of a sandy loam to loam texture. Whenever the soil is not well suited to peach growing, production is lower. Many clay loam soils in the Patterson area, for example, are deep and very fertile but are just too fine (heavy) for good peach production. Fertility and water-holding capacity are limiting factors in the loamy sands, but with excellent management some growers are producing yields comparable to the production on better soils.

Water Requirements

Mature peach trees require about 35 inches of available water per year.

The success or failure of many peach orchards has been in the irrigation system and water management. Peach trees will quickly be in distress if allowed to run out of water. They will not be benefited by excessive applications and may, in fact, be hurt by them if there is not good drainage. Poor aeration in the root zone can cause failure of fruit to size or even death of the trees. In general, the more complete the control of the irrigations, the better the orchard.

Rootstocks

Lovell rooted trees are generally recommended for peaches. An exception to this would be on some of the loamy sands where root-knot nematodes are a threat. In this situation, the best rootstock is nemaguard, which is resistant to both species of root-knot nematode.

Fertilization

Annual applications of nitrogen are universally needed in this area. The amounts needed will vary from about 100 pounds per acre to as much as 175 pounds of actual nitrogen per acre per year. Excessive use of nitrogen is common. It is costly due to the excessive wood that it produces that must be cut out. In extreme cases it can actually cause a reduction in fruit size. The form of nitrogen used usually is of little concern. Most growers use a split application. About 70% is applied in November and 30% in late March. The first application should be made at least by mid-December, in order to insure its being in the root zone by the time the tree is in bloom, when it is needed in the greatest amount. Twenty to \$30 an acre will generally cover the cost of this operation.

Zinc is the second most deficient element in the area. Many orchards need and receive zinc sprays each year. This can be put on as either a dormant or a foliar treatment. Potash is needed on some soils. When needed, it should be put on as a special massive application.

Insect and Disease Control

The peach grower who attempts to bypass pest and disease control will soon be in real difficulty. Peach blight, peach leaf curl and blossom brown rot can be controlled by applying regular preventive fall and prebloom sprays. Powdery mildew and fruit brown rot can be controlled with growing season sprays. Any of these diseases can reduce the crop.

San Jose scale is a killer of fruiting wood and main limbs. It can be controlled at several times during the year by incorporating the proper material with another spray.

Peach twig borer is the name given to one of the common worms we find in unsprayed ripe fruit. It is best taken care of in the prebloom and May sprays but can be controlled in mid-summer. Community control is needed inasmuch as this pest has wings. Oriental fruit moth (OFM) is the other fruit-infesting worm of importance in peaches. It is important for each grower to maintain bait pans for determining moth populations of OFM in his orchard. This tells him if and when he should spray.

Spider mites are an annual problem if not contained. These pests can render the foliage useless and cause it to fall, which results in a loss of fruit wood or even crop, depending on when the infestation occurs. Control of mites has become increasingly more difficult because of acquired resistance to many of the present miticides.

Other pests and diseases hamper peach growing, but the ones listed are the main ones. The average annual cost per acre of pest and disease control is about \$65 for material and \$20 for application. Detailed control measures are available in our printed spray schedules.

Pruning

This is a must and amounts to about \$90 an acre. Pruning is necessary each year to stimulate new fruiting wood, regulate the crop somewhat and keep the tree

manageable. If not cut out, dead and weak wood accumulates. Weak wood will not properly size fruit and dead wood will scar fruit. The tops must be removed each year or the trees will become too high for the pickers.

Mechanical topping has become fairly common in our local orchards. This practice has not hurt production; in fact, in some cases it has increased it. Mechanical topping does not materially reduce the cost of pruning. However, it does have a place in lowering trees that have grown too tall, or encouraging the development of low fruit wood.

Fruit Thinning

Thinning a portion of the fruit is necessary in order to obtain the maximum salable tonnage. The total crop is reduced by such a practice but the salable portion is increased over nonthinned fruit. Traditionally this work has been done by hand. This is usually a very expensive process, averaging about \$150 an acre, which is second only to harvesting.

During the past several years there has been increasing interest in mechanical and chemical spray thinning. Both methods show considerable promise, but as yet, they are not ready for commercial application.

The number of fruits remaining on the various limbs is more important than the distribution. Skips and clumps are inevitable, but if the total number of fruits is right per bearing unit, the fruit will size properly. The actual number of fruits that any given tree can size will vary with the season and the particular orchard. This is where the experience of the individual grower is especially valuable.

Harvesting

Harvesting is the most costly of all peach growing operations -- about \$250 an acre. The cost, plus the uncertainty of adequate labor is currently forcing growers to look toward mechanization. This trend is not new. It started with the use of pallets, then bins, and now actual mechanical harvesting.

Before 1966, attempts to mechanically harvest peaches were with the use of modified prune catching frames. This equipment proved to be inadequate for the handling of relatively soft fruits such as peaches. During the 1966 harvest season, the University of California conducted tests with a self-propelled catching frame that was specifically constructed for the harvest of cling peaches. These tests, several of which were conducted in the Modesto area, showed that cling peaches can be successfully harvested by machine with properly designed equipment.

Fruit loss is the key factor in determining the practicality of mechanical harvest. A five per cent increase in fruit loss will result in an increased harvest cost of \$3.00 per ton. It is generally felt that the total recovery of fruit by mechanical harvesting must be within ten per cent of hand harvest for the machine harvest to be considered a practical operation. The results of the 1966 tests indicated that fruit injury was 0 to two per cent more than hand harvest. Fruit removal was two to three per cent less than hand harvest. Therefore, the total recovery was four to five per cent less than hand harvest, well under the ten per cent guideline.

An analysis of harvest costs showed that mechanical harvesting could be accomplished at a lower cost per ton than present hand picking costs.

The following assumptions were made in computing the cost of machine harvest:

1. Machine cost of \$25000 with a five-year life, (2) harvest duration of 250 hours based on a 30 to 35 day season and an eight hour day, (3) harvest rate of 30 trees per hour, (4) yield of eight boxes per tree or 17 tons per acre, (5) a four man crew at an hourly rate of \$2.00 per hour, and (6) a total recovery of 95% of hand harvest. On this basis, the harvest cost was \$9.90 per ton. This compares to a present hand harvest cost of around \$12.50 per ton.

Another facet of mechanical harvesting explored in 1966 was the importance of tree modification. Certain trees were pruned in such a way as to eliminate limbs that might cause injury to fruit as it fell through the tree. Fruit harvested from these trees were compared with fruit from unmodified trees. The results showed no difference in fruit injury; thus, peach trees in this area appear to be already well adapted to mechanical harvest.

It is expected that there will be some commercial harvesting of peaches by machine in the next few years. The prerequisite to a successful harvest will be the purchase of a properly designed catching frame. The grower who tries to cut costs by using a less sophisticated catching frame will probably run into difficulty.

Literature Available

Short, easy to read circulars are available for most phases of clingstone peach growing. These and other fruit growing publications may be obtained from our office.

SAMPLE COSTS TO PRODUCE CLING PEACHES - STANISLAUS COUNTY - 1967

David E. Ramos, Farm Advisor
Doyle Reed, Extension Economist

Based on a 60-acre orchard, 108 trees per acre, 15 ton yield (No. 1 fruit)
Labor at \$1.95 and \$2.25 per hour including social security and compensation insurance

| Operation | Hours Per Acre | Cash and Depreciation Costs Per Acre | | | | | Total Cost |
|------------------------------------|----------------------|--------------------------------------|-------------------|-------------------|----------------|---------------|-----------------|
| | | Labor | Fuel & Repairs | Deprec- iation | Materials | | |
| | | | | | Kind | Amount | |
| Cultural Costs | | | | | | | |
| Prune 108 trees @ 75¢ | | 81.00 | 4.10 | .80 | | | 85.90 |
| Brush Removal | .8 | 1.80 | 1.00 | 1.05 | | | 3.85 |
| Shred Brush | 1.5 | 3.40 | 2.10 | 2.80 | | | 8.30 |
| Fertilize 2x | 1.0 | 2.25 | 1.30 | 1.40 | Material | 28.45 | 33.40 |
| Spray 7x | 2.1 | 4.75 | 7.80 | 7.50 | Material | 65.00 | 85.05 |
| Cultivate 10x | 4.0 | 9.00 | 8.80 | 5.50 | | | 23.30 |
| Ridge & knock 4x | .8 | 1.80 | 1.15 | 1.55 | | | 4.50 |
| Irrigate 6x | 1.8 | 3.50 | 1.00 | 4.00 | Water Tax | 1.10 | 9.60 |
| Thin @ \$1.35 tree | | 145.80 | 4.00 | | | | 149.80 |
| Prop & Wire | 4.0 | 7.80 | 5.00 | 5.20 | | 4.00 | 22.00 |
| Hoe @ 5¢ tree | | 5.40 | | | | | 5.40 |
| Replant | .2 | .50 | | | Tree | .70 | 1.20 |
| Misc. | 2.0 | 4.20 | 2.10 | 4.15 | | 5.00 | 15.45 |
| TOTAL CULTURAL COSTS | | 271.20 | 38.35 | 33.95 | | 104.25 | 447.75 |
| Harvest Costs | | | | | | | |
| Pick - 16-2/3 T. @ \$15 | | 249.90 | | 2.40 | | | 252.30 |
| TOTAL HARVEST COSTS | | 249.90 | | 2.40 | | | 252.30 |
| Overhead Costs | | | | | | | |
| Misc., office, etc. | | | | 13.15 | | 33.10 | 46.25 |
| Taxes | | | | | | 32.00 | 32.00 |
| Tree Depreciation | | | | 51.00 | | | 51.00 |
| Marketing Order | | | | | 15 tons @ 2.25 | 33.75 | 33.75 |
| TOTAL OVERHEAD | | | | 64.15 | | 98.85 | 163.00 |
| TOTAL CASH AND DEPRECIATION | | 521.10 | 38.35 | 100.50 | | 203.10 | 863.05 |
| Interest | | | | | | | 139.35 |
| Management 5% of 15 Tons @ \$70 | | | | | | | 52.50 |
| TOTAL COST PER ACRE | | | | | | | 1,054.90 |
| COST PER TON @ 15 ton yield | | | | | | | 70.30 |

INVESTMENT FOR CLING PEACH PRODUCTION

Stanislaus County - 1967

David E. Ramos, Farm Advisor - Dovle Reed, Extension Economist

| Item | Cost | Life | Depreciation | Operation Cost Per Hour | Hours Used | Depreciation Per Hour | Hours Per Acre |
|-------------------------|----------|--------|--------------|----------------------------|---------------|--------------------------|-------------------|
| | Per Acre | Total | | | | | |
| Land - 60 acres | 1,500 | 90,000 | | | | | |
| Trees - 60 acres | 1,017 | 61,020 | 20 | 3,051 | | 51.00/acre | |
| Irrigation svstem | 100 | 6,000 | 25 | 240 | | 4.00/acre | |
| Buildings | 120 | 7,200 | 25 | 288 | | 4.80/acre | |
| Equipment | | | | | | | |
| Tractor WD 40 | 6,350 | 10 | 635 | 1.05 | 972 | .65 | |
| Pruning equipment | 250 | 5 | 50 | .10 | | .80/acre | |
| Trailers (2) | 2,800 | 15 | 187 | .20 | 288 | .65 | |
| Shredder PTO 7½' | 1,200 | 10 | 120 | .35 | 90 | 1.22 | .6 |
| Fertilizer spreader 12' | 450 | 10 | 45 | .25 | 60 | .75 | .5 |
| Sprayer 500 gal. | 5,500 | 15 | 367 | 2.65 | 126 | 2.91 | .3 |
| Disc 10' | 1,750 | 10 | 175 | 1.15 | 240 | .72 | .4 |
| Ridger | 600 | 10 | 60 | .40 | 48 | 1.25 | .2 |
| Ladders 120 @ \$12 | 1,440 | 10 | 144 | | | 2.40/acre | |
| Misc. | 1,660 | 10 | 166 | | | 2.75/acre | |
| Total Equipment | 366 | 22,000 | | | | | |
| Pickup | 42 | 2,500 | 5 | 500 | | 8.35/acre | |
| | 24,520 | | 408.33/acre | 2,449 | | 40.70/acre | |
| Total Investment | 188,720 | | 6,028 | | | | |
| Per Acre on 60 Acres | 3,145 | | | | | | |
| Depreciation per Acre | | | 100.50 | | | | |
| Interest per Acre | 139 | | | | | | |

MONTHLY CASH FLOW FOR CLING PEACHES
Stanislaus County - 1967
David E. Ramos, Farm Advisor - Doyle Reed, Extension Economist

| Operation | Total | Month | | | | | | | | | | | |
|-------------------------------|---------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | | Nov | Dec | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct |
| Cultural Costs | | | | | | | | | | | | | |
| Prune | 85.10 | | 85.10 | | | | | | | | | | |
| Brush removal | 2.80 | | 2.80 | | | | | | | | | | |
| Shred brush | 5.50 | | | 5.50 | | | | | | | | | |
| Fertilize 2x | 3.55 | 1.80 | | | | 1.75 | | | | | | | |
| Fertilizer | 28.45 | 14.25 | | | | 14.20 | | | | | | | |
| Spray 7x | 12.55 | | | 1.80 | | | 1.80 | 1.80 | 1.80 | 1.80 | 1.80 | 1.75 | |
| Spray material | 65.00 | | | 18.30 | | | 7.80 | 7.80 | 7.80 | 7.80 | 7.80 | 7.70 | |
| Cultivate 10x | 17.80 | | | | | | 3.60 | 3.55 | 3.55 | 3.55 | | 3.55 | |
| Ridge 4x | 2.95 | | | | | | .75 | .75 | .75 | .70 | | | |
| Irrigate 6x | 4.50 | | | | | | .75 | .75 | .75 | .75 | .75 | .75 | |
| Water tax | 1.10 | | 1.10 | | | | | | | | | | |
| Thin | 149.80 | | | | | | | 149.80 | | | | | |
| Prop & wire | 16.80 | | | | | | | | | 16.80 | | | |
| Hoe | 5.40 | | 5.40 | | | | | | | | | | |
| Replant | 1.20 | | | | 1.20 | | | | | | | | |
| Misc. | 11.30 | .95 | .85 | .95 | .95 | .95 | .95 | .95 | .95 | .95 | .95 | .95 | .95 |
| Harvest Costs | | | | | | | | | | | | | |
| Pick | 249.90 | | | | | | | | | | | 249.90 | |
| Cash Overhead | | | | | | | | | | | | | |
| Miscellaneous | 33.10 | 2.75 | 2.85 | 2.75 | 2.75 | 2.75 | 2.75 | 2.75 | 2.75 | 2.75 | 2.75 | 2.75 | 2.75 |
| Taxes | 32.00 | | 16.00 | | | | 16.00 | | | | | | |
| Market order | 33.75 | | | | | | | | | | | 33.75 | |
| TOTAL CASH COSTS | 762.55 | 19.75 | 114.10 | 29.30 | 4.90 | 19.65 | 34.40 | 168.15 | 18.35 | 35.10 | 297.70 | 17.45 | 3.70 |
| ACCUMULATED CASH COSTS | | 19.75 | 133.85 | 163.15 | 168.05 | 187.70 | 222.10 | 390.25 | 408.60 | 443.70 | 741.40 | 758.85 | 762.55 |