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PRUNES IN TEHAMA COUNTY

1967

University of California
Agricultural Extension Service
Tehama County

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UC Cooperative Extension

PRUNES IN TEHAMA COUNTY*

California produces about 85 percent of the world's prune tonnage. In 1965, there were 116,071 acres of prunes in California - 25,323 acres which were nonbearing and 90,748 bearing acres. Tehama County is the fifth largest prune growing area in the state with 7,532 total acres - 4,757 bearing and 2,775 nonbearing acres in 1966. Prunes are especially adapted to Tehama County conditions and are the major tree crop produced.

SOIL

Prunes are best raised on the deep, well-drained soils found along the Sacramento River and its tributaries. Although possibly best adapted to loam and clay loam soils they also do well on sandy and gravelly soils. A perched water table condition exists on the east side of the valley, on some of the shallow soils overlaying hardpans, which presents some prune production problems.

Dieback, a result of overcropping and/or potassium deficiency is common on alluvial soils associated with the tributaries of the Sacramento River, particularly in areas of cuts made during land leveling.

Fruit thinning and potash fertilizer injected into the soil at rates of 25 to 50 pounds per tree every 4 or 5 years helps correct this condition.

Zinc deficiency is usually found in areas of old corral sites and ancient Indian mounds. It is also often found on sandy soils associated with the Sacramento River. It is corrected by sprays of zinc oxide at the rate of 5 to 6 pounds per 100 gallons of water applied in the spring or summer or 25 pounds of zinc sulphate per 100 gallons of water during dormancy.

Nitrogen is seldom needed until the trees come into bearing. Mature orchards require 80 to 100 pounds of actual nitrogen annually.

WATER AND IRRIGATION

A number of mutual water companies and irrigation districts are located in the county. In many instances arrangements have been made for growers to place pumps in the distribution systems for sprinkler irrigation.

In a few locations on the east side of the Sacramento River, excess boron has been found in ground water being pumped. The known areas are Jelly's Ferry and the Salt Creek drainage.

Total water requirements of about 2.5 acre-feet per acre have been measured on mature orchards. An irrigation in July will cause fruit cracking if the trees have been under a prior moisture stress.

*by Wallace R. Schreader, Farm Advisor, Tehama County

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CLIMATE

The chief climatic factors in the county are spring frost, spring rains and hail, summer and fall heat, and fall rains.

Spring Frost is spotty and infrequent. It has not proven profitable for growers to use orchard heating practices.

Spring Rains and Hail. In most years there is not enough spring rainfall to add to the effective soil moisture. Frequent light showers often keep the top foot of soil too wet to prepare for flood irrigation, thus causing serious delay in the first irrigation. Some general areas are more prone to hail storms than others. The advice of longtime residents is suggested to get the history of any particular area.

Summer and Fall Heat. These cause two types of damage. Sunburning of exposed fruit causes heavy drop some years. Hot weather during harvest results in pit burning and darkening of flesh color which reduces quality. Heat damaged exposed limbs are often invaded by diseases and pests.

Fall Rains. Light showers in late September usually stop the harvest for one or more days except on the very sandy soils. The fall rains sometime induces the leaf disease peach rust causing premature defoliation which causes some problems during harvest.

ROOTSTOCKS AND VARIETIES

Plum rootstocks Myrobalan 29C and Marianna 2624 are used for their resistance to Oak Root Fungus and some nematodes. Some newer plum roots are now being tested locally. These roots tend to blow over in the wind during the first five to seven years of growth. Some growers are now using Myrobalan seedlings which are less apt to blow over but are more prone to Oak Root Fungus and nematode invasion. Tests of three new rootstocks with Oak Root Fungus resistance are now being conducted in local orchards.

Peach roots are seldom used except for interplants because of their susceptibility to Oak Root Fungus, nematodes, excessive bearing and dieback. Peach seedlings are more stable in the wind and the trees are less apt to get the bacterial disease Gummosis or Canker.

French prunes are usually planted because of their consistent bearing of high-quality fruit. Gerrans Early French is at least seven to ten days earlier in maturity and is being used to lengthen the harvest period. Robe de Sargent and Imperial are sometimes used to extend the harvest season. They produce inconsistent crops of lower quality and are more difficult to harvest and dehydrate. Trials of five recently introduced varieties from France are now underway in local orchards. They are not in bearing at this time.

PLANTING DISTANCES

Trees are usually planted 22 or 24 feet apart on the square. Closer plantings produce more per acre at an earlier age but are not recommended for permanent plantings because of the shading out of lower growth as the trees become mature and meet in the middles. Interplanting an orchard with a temporary tree in the center of the square is becoming popular as well as hedgerows of 11' x 22' or 12' x 24' with the extra trees to be removed later when crowding occurs. The hedgerows are preferred to run north and south for more uniform light penetration.

COMING INTO PRODUCTION

Prunes are borne primarily on spurs. In order to encourage spur formation, heading back or excess fertilization is to be avoided. These lead to excessive vegetative growth rather than flower bud formation and can delay bearing one to three years or more.

COVERCROPS AND MODIFIED SOD CULTURE

Covercrops can consist primarily of native weed growth. Since little or no increase in nitrogen or organic matter can be maintained under normal California orchard conditions, the principal function of a covercrop is to loosen the soil by root penetration. This reduces compaction and increases the rate of water intake.

It is becoming a common practice to allow native weed growth to grow all spring and summer. The weeds are chopped or mowed periodically to reduce competition and avoid fire danger. This practice is particularly desirable under sprinkler irrigation. The soil must be disced and worked down where fruit is knocked to the surface prior to harvest.

Modified sod culture requires 30-40 pounds of supplemental nitrogen in the late spring to help decompose excess plant residues. An extra irrigation is also required. A weed oil and water spray around the base of older trees reduces the cost of hoeing, a guard or shield should be used to keep the oil off the trunks of young trees, particularly if they still have smooth bark.

PESTS AND DISEASES

Insect Pests: Peach Twig Borer, Red Spider, Brown Almond Mites, Leaf Curl and Mealy Plum Aphid, Red Humped Caterpillar, and San Jose Scale are the most common pests. Others found less commonly in economic amounts are Brown Apricot Scale, Parlatoria Scale, Italian Pear Scale, Diabrotica Beetles, Flat Headed Borers, Shot Hole Borers and various nematodes.

Diseases: Bacterial Gummosis, Oak Root Fungus, Crown Gall, Crown Rot, Ceratocystis Canker, and Cytospora Canker are the major diseases of this area. Others less commonly found are Peach Leaf Rust and Brown Rot.

LIST OF LOCAL PRUNE BUYERS

California Packing Company, San Francisco. Local representative: Joe Bratton, Chico.
Mayfair Packing Company, San Jose. Local representative: Laurel Hunt, Red Bluff.
Sunsweet Growers, Inc., San Jose. Local representative: Latane Sale, Corning Cooperative Drier, Corning.
Valley View Packing Company, San Jose. Local representative: George Lindauer, Red Bluff.

PRUNE PRODUCTION COSTS

The following cost studies were developed to give an idea of expected costs per acre. The figures are typical costs under assumed conditions and are not representative of any one particular orchard or average for the county as a whole.

There are three different cost studies here comparing (1) a 40-acre, flood irrigated, hand harvested operation; (2) an 80-acre sprinkler irrigated, mechanically harvested orchard; (3) a 250-acre hedgerow planted, sprinkler irrigated, mechanically harvested, two 8-hour shifts a day, strip sprayed with weed oil, and planted to 50 acres of Gerrans Early French prunes.

The important thing to remember is that when considering total costs you must consider all costs both variable and fixed.

Variable Costs are those costs that vary with production such as gasoline, fertilizer, spray materials, hired hourly or piece work labor.

Fixed Costs are those of an "overhead" nature that must be met regardless of production. They are of two types. Cash fixed costs include taxes, insurance, cash interest on loans, etc. The non-cash fixed costs are primarily depreciation and interest on your capital investment and your own labor and management charge.

A study of this type serves a useful purpose by showing how different combinations of land, labor, capital and management can affect production costs.

It is strongly suggested that you keep records of your operation to supply this information to you and that you budget your operations into the future in a manner similar to this to use as a guide in decision making.

CAPITAL INVESTMENT AND FIXED COSTS
40 ACRES HAND HARVESTED, FLOOD IRRIGATED FRENCH PRUNES

Investment	Capital Investment	Investment Per Acre	Expected Life	Fixed Costs Per Acre	
				Interest	Depreciation
Land - 40 acres	$ 40,000.00	$ 1,000.00	--	$ 60.00	
Trees - 75 per acre	40,000.00	1,000.00	30 years	30.00	$ 33.33
Irrigation System	2,400.00	60.00	30 years	1.80	2.00
Wheel Tractor (1)	5,400.00	135.00	10 years	4.05	13.50
Disc	1,500.00	37.50	15 years	1.11	2.50
PTO Sprayer, 400 gals.	2,800.00	70.00	15 years	2.10	4.66
Ridger	400.00	10.00	10 years	.30	1.00
Landplane	1,500.00	37.50	20 years	1.13	1.87
Roller	250.00	6.25	20 years	.18	.33
Buck Rake	1,700.00	44.00	10 years	1.32	4.40
Pickup Truck	2,300.00	57.50	10 years	1.72	5.75
Trailer	500.00	12.50	20 years	.37	.62
Shed and Shop	5,200.00	130.00	30 years	3.90	4.33
Pruning Equipment	250.00	6.25	10 years	.19	.63
Lug Boxes	600.00	15.00	10 years	.45	1.50
TOTAL	$104,800.00	$ 2,528.75	--	$108.62	$ 76.42

TYPICAL COSTS TO PRODUCE DRIED PRUNES IN TEHAMA COUNTY--1967
40 ACRES--HAND HARVESTED AND FLOOD IRRIGATED

Operation	Hours Per Acre	Cash and Labor Costs				Cost Per Acre
		Labor	Equipment	Materials		
CULTURAL						
Prune	24.0	$ 42.00	$ 1.00			$ 43.00
Brush Disposal	2.0	3.50	3.00			6.50
Fertilize	.3	.50	.45	100# Nitrogen	$12.00	12.95
Hoe	2.0	2.70				2.70
Disc Covercrop	1.0	1.75	1.65			3.40
Irrigate 4 times	16.0	24.00	6.00	2.5 acre-feet water	10.00	40.00
Thin	7.0	9.45				9.45
Spray 2 times	1.2	2.10	4.20	Chemicals	20.00	26.30
Taxes, Ins. & Misc.					40.00	40.00
Total Cultural and Miscellaneous Cash Costs		$ 86.00	$ 16.30		$82.00	$ 184.30
HARVEST AND PROCESS						
Disc 2 times	1.0	1.50	1.65			3.15
Landplane & Roll	1.0	1.50	1.80			3.30
Shake		Contract @ $10.00 an hour				14.00
Pick Up & Box		$12.00 a ton				82.44
Haul to dipper		$3.00 a green ton contract				20.61
Dip & dehydrate		$18.00 a green ton contract				123.66
Total Harvest and Process Cash Cost						$247.16
TOTAL CASH COSTS						$431.46
Yield - 2.5 dry tons @ 2.75 to 1 dry away				Total fixed costs per acre		$185.04
				Total per acre costs		$616.50
				Total cost per ton		$246.60

CAPITAL INVESTMENT AND FIXED COSTS--80 ACRES MECHANICALLY HARVESTED, SPRINKLER IRRIGATED FRENCH PRUNES

Investment	Total Cost	Cost Per Acre	Expected Life	Fixed Cost Per Acre	
				Interest	Depreciation
Land -- 80 acres	$ 80,000.00	$ 1,000.00	--	$ 60.00	--
Trees -- 75 per acre	80,000.00	1,000.00	30 years	30.00	$ 33.33
Irrigation system	10,000.00	125.00	20 years	3.75	6.25
Wheel tractors (2)	10,800.00	135.00	10 years	4.05	13.50
Chopper	450.00	5.62	10 years	.17	1.56
PTO Sprayer, 400 gals.	2,800.00	35.00	15 years	1.05	2.33
2 Shakers	5,400.00	67.50	5 years	2.03	13.50
Catching frame	10,000.00	125.00	5 years	3.75	25.00
Bins	1,000.00	12.50	10 years	.37	1.25
Fork lift (tractor)	1,000.00	12.50	15 years	.37	.84
Pallet wagon	500.00	6.25	20 years	.19	.31
Buck rake	1,700.00	22.00	10 years	.66	.22
Pickup truck	2,300.00	28.75	10 years	.87	2.87
Shed and shop	5,200.00	65.00	30 years	1.88	2.17
Pruning equipment	500.00	6.25	10 years	.19	.63
TOTAL	$211,650.00	$2,646.37		$109.23	$102.76

Interest--6% of one-half the cost per acre on all depreciable items. 6% of the full value of land.
Depreciation--Computed as straight line; i.e. divide the cost per acre by the expected life of equipment.

TYPICAL COSTS TO PRODUCE DRIED PRUNES IN TEHAMA COUNTY--1967
80 ACRES--MECHANICALLY HARVESTED AND SPRINKLER IRRIGATED

Operation	Hours Per Acre	Cash and Labor Costs				Cost Per Acre
		Labor	Equipment	Materials		
CULTURAL						
Prune	24.0	$ 42.00	$ 1.00			$ 43.00
Brush Disposal	2.0	3.50	3.00			6.50
Fertilize	.3	.50	.45	100# Nitrogen	$12.00	12.95
Hoe	2.0	2.70				2.70
Chop Covercrop 6 times	1.8	3.15	1.80			4.95
Irrigate 4 times	2.4	4.20	.25	2.5 acre-feet water	12.50	16.95
Thin	7.0	9.45				9.45
Spray 2 times	1.2	2.10	4.20	Chemicals	20.00	26.30
Taxes, Ins., & Misc.					40.00	40.00
Total Cultural and Miscellaneous Cash Costs		$ 67.60	$10.70		$84.50	$162.80
HARVEST & PROCESS						
Shake and Catch 90% of crop	2.0	13.00	2.50			15.50
Pick windfalls, 10% of crop @ 50¢ box		13.00				13.00
Haul to dipper	$3.00 a green ton contract					20.61
Dip and Dehydrate	@ $18.00 a green ton contract					123.66
Total Harvest Cash Costs						$172.77
TOTAL CASH COSTS						$335.57
Yield - 2.5 dry tons @ 2.75 to 1 dry away				Total fixed costs per acre		$211.99
				Total annual per acre cost		547.56
				Total cost per ton		219.02

CAPITAL INVESTMENT AND FIXED COSTS--250 ACRES MECHANICALLY HARVESTED, SPRINKLER IRRIGATED FRENCH AND GERRANS EARLY FRENCH PRUNES

Investment	Total Cost	Cost Per Acre	Expected Life	Fixed Cost Per Acre	
				Interest	Depreciation
Land - 250 acres	$ 250,000.00	$ 1,000.00	--	$ 60.00	--
Trees - 150 per acre	312,500.00	1,250.00	25 years	37.50	$50.00
Irrigation System	31,250.00	125.00	20 years	3.75	6.25
Wheel tractors (2)	10,800.00	43.20	10 years	1.30	4.32
Chopper	450.00	1.80	10 years	.05	.18
PTO Sprayer, 400 gals.	2,800.00	11.20	15 years	.34	1.74
1 Trunk Shaker	5,400.00	21.60	5 years	.65	4.32
Catching Frame	10,000.00	40.00	5 years	1.20	8.00
250 Harvest Bins	4,000.00	16.00	10 years	.48	1.60
Fork Lift	5,000.00	20.00	15 years	.60	1.33
3 Pallet Wagons	1,500.00	6.00	20 years	.18	.30
Buck Rake	1,700.00	6.80	10 years	.20	.68
Pickup Truck	2,300.00	9.20	10 years	.28	.92
Shed and Shop	5,200.00	20.80	30 years	.62	.69
2 Pruning Towers and Tools	5,000.00	20.00	10 years	.60	2.00
TOTAL	$647,900.00	$2,591.60	--	$107.75	$81.33

Interest--6% of one-half the cost per acre on all depreciable items. 6% of the full value of land.
Depreciation--Computed as straight line; i.e. divide the cost per acre by the expected life of equipment.

ASSUMED COSTS TO PRODUCE DRIED PRUNES IN TEHAMA COUNTY--1967
250 ACRES MECHANICALLY HARVESTED AND SPRINKLER IRRIGATED

Operation	Hours Per Acre	Cash and Labor Costs				Cost Per Acre
		Labor	Equipment	Materials		
CULTURAL						
Prune	25.0	$ 43.75	$ 2.00			$ 45.75
Brush Disposal	3.0	5.25	3.00			8.25
Fertilize	.3	.50	.50	100# nitrogen	$12.00	13.00
Strip Spray Twice	.6	1.00	.60	20 gals. weed oil	4.00	5.60
Chop sod 6 times	1.8	3.50	1.80			5.30
Irrigate 4 times	2.4	4.20	.25	2.5 acre-feet water	12.50	16.95
Thin	10.0	17.50	-			17.50
Spray Twice	1.2	2.10	4.20			6.30
Taxes, Ins. & Misc.					50.00	50.00
Total Cultural and Miscellaneous Cash Costs		$ 77.80	$12.35		$78.50	$168.65
HARVEST AND PROCESS						
Shake and Catch 90%	3.0	$ 19.50	$ 3.00			$ 22.50
Pick Windfalls 10%	1.8 tons @ 50¢ a box					34.20
Haul to dipper	@ $2.00 a green ton contract					36.00
Dip and dehydrate	@ $18.00 a green ton contract					324.00
Total Harvest Cash Cost						$416.70
Total Cash Costs						$585.35
Yield - 6 dry tons @ 2.75 to 1 dry away				Total fixed costs per acre		$189.08
				Total annual costs per acre		$774.43
				Total cost per ton		$129.07

SUGGESTED READING - - - - -

The following selected publications are available for distribution at your Farm Advisors' Office, P. O. Box 370, Red Bluff. (Upstairs in the Post Office Building or telephone 527-3101.)

Prune Orchard Costs From Planting to Picking, 1966

Prune Production

Foliar Application of Mineral Nutrients to Fruit Trees

Insect Pest and Disease Control Program -- Prunes

Peach Twig Borer Control

Propagation of Temperate Zone Fruit Plants

Essentials of Irrigation and Cultivation of Orchards

Contour Check Method of Orchard Irrigation

Sprinkler Irrigation

Orchard Plow Pans

Fertilizers for Deciduous Fruit and Nut Trees

Fertilizers and Covercrops in California Orchards

Pruning Dedicuous Fruit Trees

Pacific Flatheaded Borers

Oak Root Fungus and Its Control

Armillaria Root Rot

Bacterial Canker of Deciduous Fruits

Rootstocks for Plums and Prunes in California

Parallel Flow Prune Dehydration

Ceratocystis Canker of Almond, Prune, and Apricot

Prune Maturity Tests for Harvest Timing

Whitewash for Trees

Crown Rot of Deciduous Fruit and Nut Trees

Dried Fruit Sanitation

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