

Olive Tree Spacing

studies indicate wide spacing of trees advantageous to yields

Karl Opitz and H. T. Hartmann

Olive trees in the outside rows of orchards or in border row planting generally outyield trees growing in solid block plantings. This is believed to result from less root and top competition. Compared with the solid block plantings, border row trees are better illuminated and the roots spread into areas where such essentials as water and soil nutrients are more readily available.

The usual planting distance for olives—though there are numerous exceptions—is about 30' x 30' in Tulare County, 28' x 28' in Butte County and 22' x 22' in Tehama County. Very little yield data on comparable block plantings with different spacings are available.

Studies were undertaken to obtain some idea of the best spacing for Mission and other olive varieties. Two blocks of Mission olive trees were brought under cultivation in 1938 after they had been abandoned for a number of years. They are within a quarter of a mile of each other in the northern part of Tulare County on comparable soil areas of San Joaquin clay loam and Greenfield sandy loam.

The trees are all of the same age and stock. The east block of trees consists of seven acres with the trees planted 44 feet apart each way. The west block of trees is 15 acres in size with the trees planted on 30-foot squares.

Both blocks of trees have been under the same management and treated alike in such respects as fertilization, irrigation, cultivation, pest control, and harvesting.

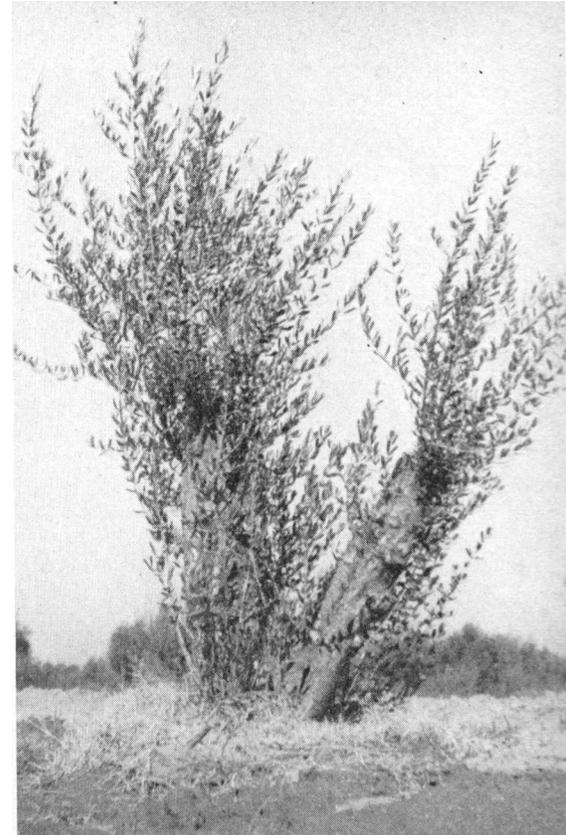
Yield records for each block of trees were kept separate during five harvest seasons, from 1944 to 1946 and in 1948 and 1949. These data, which are presented in the accompanying table of yields show that with the 44' x 44' spacing there was an increase in yield over the 30' x 30' spacing of 77% on a tree basis and 52% on an acre basis.

In the second table a comparison is made for the 1949 season of gross income between trees grown on the 30' x 30' spacing with those planted 44' x 44' apart. This table, which takes into consideration the size grades, shows that the fruit was slightly larger on the trees with the wide spacing. In 1949 there was an increase in gross income of \$240.29 per acre with trees planted on the wider spacing.

Very few olive orchards in California are planted as far apart as 44' x 44'. In fact, 30' x 30' is considered to be a fairly generous planting distance with an appreciable percentage of the orchards being set even closer than this.

There are many orchards in California in which the trees are obviously planted too close together. One of these orchards, with trees set 20' x 20' apart was given a severe pruning in an attempt to overcome the crowded condition. Such heavy pruning further reduces yields by removing fruiting wood.

A much better solution to this problem would be to pull out a portion of the trees. In an orchard planted 20' x 20', the removal of every other tree in every row, starting with alternate trees, would leave the trees on a diagonal 28' x 28' spacing, which would still be a minimum desirable distance. A further removal perhaps several years later, of all the remaining trees in every other row would leave a final



Transplanted mature olive tree three years after moving.

spacing of 40' x 40' which could be expected to result in an increase in yields per acre in a few years after new fruiting wood developed. Another important ad-

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Effect of Planting Distance on Yields of Mission Olives During Five Harvest Seasons—Tulare County

	Yield per tree		Yield per acre	
	Close spacing (30 x 30)	Wide spacing (44 x 44)	Close spacing (30 x 30)	Wide spacing (44 x 44)
1944	29 lbs.	128 lbs.	1,450 lbs.	2,880 lbs.
1945	4	26	194	585
1946	26	116	1,258	2,610
1948	46	214	2,226	4,815
1948	55	201	2,352	4,771
Average of 5 years	32 lbs.	137 lbs.	1,496 lbs.	3,132 lbs.
Annual increase in yields due to wide spacing		105 lbs.		1,636 lbs.
Per cent increase in yields		77%		52%

Gross Income per Acre for the 1949 Harvest Season from Mission Olives Planted 30 x 30 in Comparison with Trees Planted 44 x 44

Size grades and price per lb.	Size grades and yields per acre—1949					
	30 x 30 spacing			44 x 44 spacing		
	Lbs.	Per cent	Value	Lbs.	Per cent	Value
Mammoth (16.5¢)	21	0.4	\$ 3.47
Extra large (14.8¢)	178	7.5	\$ 26.34	389	8.2	57.57
Large (13.0¢)	498	21.2	64.74	1,171	24.5	152.23
Medium (11.3¢)	777	33.0	87.80	1,363	28.6	154.02
Standard (10.0¢)	503	21.4	50.30	771	16.2	77.10
Substandard (3.8¢)	396	16.8	15.05	1,056	22.1	40.13
	2,352 lbs.		\$244.23	4,771 lbs.		\$484.52
Increased income per acre in 1949 with wide spacing						\$240.29

NEW PUBLICATIONS



—now ready for distribution—

Each month, new publications of the College of Agriculture are listed in this column as they are received from the press.

BREEDING CHICKENS FOR MEAT PRODUCTION, by V. S. Asmundson and I. Michael Lerner. Exp. Sta. Bul. 675 (revised) January 1951. For the professional poultryman who wants technical information about the genetic factors influencing quality and quantity of meat on chickens.

Single copies of these publications or a catalogue of Agricultural Publications may be obtained without charge from the local office of the Farm Advisor or by addressing a request to: Agricultural Publications, 22 Giannini Hall, University of California, College of Agriculture, Berkeley 4, California.

OLIVE

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vantage would be the ease of harvesting due to the production of fruiting wood around the sides of the tree as well as in the top.

Transplanting

Olive growers contemplating a tree removal program are fortunate because the olive is a fruit tree species in which mature trees can be dug up or pulled out and replanted in a new location. It is necessary to cut the scaffold branches back to the trunk and to remove practically the entire leaf area but in a few years transplanted olive trees will again be in bearing. Such trees will be in full bearing much sooner than trees started from nursery stock. A two-fold advantage can thus be obtained—the removal of trees from overcrowded orchards with the resultant increase in yields, and the rapid establishment of a new bearing orchard.

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The above progress report is based on Research Project No. 1301.

CORRECTION

In the article, *Mites on Walnuts*, published on page 9 of the February 1951 issue of *California Agriculture* the data pertaining to five tests with Aramite (88R) were given. The figures for the fifth treatment should read as shown in the reduced table at the right.

Control of Spider Mites Obtained with the Acaricide Aramite (88R)

Treatment and composition per 100 gallons of water	Date applied	Average number of active mites per sample						
		July 24	Aug. 1	Aug. 2	Aug. 4	Aug. 9	Aug. 21	Sept. 1
3/4 pints 25% emulsion + 4 oz. multifilm L	Aug. 2	124.3**	25.4	12.8	12.7	7.7
				(25)*	(50)	(50)	(50)	(50)

*Number of leaflets examined. **Pretreatment count.

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Gifts to the University of California for research by the College of Agriculture accepted in January, 1951.

BERKELEY

Daniel I. Arnon..... Barcroft-Warburg apparatus, stainless steel, for fourteen manometers, with manometers, vessels, and other accessories
Shell Chemical Corporation
Soil fungicidal fumigant; active ingredient being 1,3 chlorobromo propene
For soil fumigation studies
West Virginia Pulp and Paper Company..... 30 pounds of Tallene Ester
For nutritional experiments with chicks

DAVIS

American Chemical Paint Company..... 1 gallon 2,4,5-T (butoxyethanol ester) or Weedon 2,4,5-T
1 quart ACP-648
1 quart ACP (Weedone 2,4,5-T)
For experimental use in brush control
Carbide and Carbon Chemical Corporation..... 1 gallon Amine 220
1 gallon 2 methylpentandiol-2,4
For experimental use in brush control
Commercial Solvents Corporation..... 1 8-ounce sample each of the following experimental chemicals: Furfurylamine, Alkaterge C, Glucaterge 12, and Glucaterge 28
To ascertain possible use with herbicides
DiGiorgio Fruit Corporation..... \$1,000.00
To support the established project on mineral nutrition of fruit trees
Dow Chemical Company..... Experimental herbicides:
5 pounds 2,4-D acid
5 pounds 2,4,5-T
1/2 gallon Propylene glycol
50 pounds NaTCA (90%)
1 Jiffy applicator for Mc-2
For experimental use in weed control in brush
Chester Himel..... Basal applicator
For use in experimental work in brush control
Lederle Laboratories Division (American Cyanamid Company)..... \$5,000.00
For work on laboratory and field clinical investigations on sulfonamides, antibiotics and other such agents in the treatment of diseases of livestock, including poultry
Poultry Producers of Central California..... 345 dozen eggs
For research

LOS ANGELES

Atkins and Durbrow, Limited..... 75 pounds Driconure fertilizer
For experimental research in turf culture
Soil Pep Sales Company..... 300 pounds Pep Soil
For experimental research in turf culture
Yoder Brothers..... 650 Chrysanthemum cuttings
For floricultural research

RIVERSIDE

The Dow Chemical Company, Great Western Division..... \$2,640.00
For continuation of studies of Dow chemicals for the control of red spider and associated pests