

Fair Oaks Orchard Demonstration Project

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Maintenance of tree height and production of fruit low on the tree are important goals that are often neglected for backyard fruit trees (Bethell 1989, Kourik 1986). Many standard trees will grow to 20- 25 feet tall if not pruned, and most backyard gardeners become frustrated when fruit production on their trees moves beyond their reach from the ground. Even dwarfing rootstocks, which usually grow to 12-15 feet, are too tall for most people to manage. Most of the information on training and pruning of fruit trees is derived from commercial orchard culture, in which trees are planted on widely spaced rows for tractor access and are trained to an open center for sunlight penetration into the lower part of the tree (Micke *et al.* 1980). This type of tree training, which includes the necessary rejuvenation of fruiting wood, is often complicated for most gardeners. Furthermore, pruning only during the dormant season stimulates vigorous growth and shading. Backyard trees are often allowed to grow too tall and then drastically cut back years later, which leads to sunburned scaffold branches, borers, and eventually decline and death of the trees.

A unique training system has been developed by Ed Laivo of Dave Wilson Nursery, Hickman CA. This method utilizes high-density plantings and a sound and simple principle of summer pruning to maintain tree height and to produce fruit that ripens successively throughout the summer (Dave Wilson Nursery 1994). This method is gaining in popularity and appears to provide a win-win situation: The homeowner harvests sufficient fruit from the ground over an extended season and spends less time in tree maintenance, and nurseries benefit by selling more trees.

This approach is remarkably simple and does not require knowledge of scaffold selection or location of fruiting wood, and no ladders are required. In this method, bare root trees are headed at about 15 inches to force very low scaffold limbs. After the spring flush of growth, the new growth is cut back by half. In late summer, the subsequent growth is cut back by half. The same technique is used for year two. From year three on, the new shoots are simply removed two or three times each growing season at the permanent tree height chosen by the gardener (usually the height at which



Figure 1. Fair Oaks Orchard, Spring 1998.

shoots can be cut from the ground). In addition, crowding branches are periodically removed each spring and summer as necessary. This method allows sufficient sunlight into the lower portion of the trees, and pruning during spring and summer reduces the likelihood of diseases such as bacterial canker (stone fruits) and Eutypa (apricots). Thinning of fruit is still required.

The beauty of this method is that trees can be confined to small spaces, enabling the gardener to plant multiple species and varieties that ripen over the course of the summer. Multiple trees can also be planted in one large hole, so that if only one tree space is allowable, sequential ripening is still possible. Multiple grafted trees can accomplish the same goal, but often one species dominates over the others. The planting of multiple trees per hole permits simple separation and tree size control by summer pruning. Hedgerows can also be planted as a landscape barrier or along a fence.

Goals and Objectives

The goal of this project is to provide the public with hands-on instruction in the training and pruning of fruit trees in high- and low-density plantings, as well as other backyard orchard cultural practices.

The project is a cooperative effort between UC Cooperative Extension in Sacramento County and the Fair Oaks Recreation and Parks District. It is located at Fair Oaks Park adjacent to the community garden (Figure 1). Eight UC Master Gardeners assisted in implementing the project but this number grew to 23 in 1999. Hands-on workshops at the orchard provide gardeners and professional landscapers with training in backyard orchard culture and edible landscaping. Instruction is provided in variety selection and sequential ripening,

planting, training, pruning, drip irrigation, mulching, budding and grafting, and pest management.

In April 1998, 61 of the trees were planted; four more full-sized trees will be planted in January 2000 in order to demonstrate pruning of various-aged trees. The orchard site is 5,000 sq. ft. The specific systems we are demonstrating are as follows (Figure 3, Table 1):

1. Standard, open center-trained stone fruit trees (two trees each of apricot, cherry, and plum, planted two years apart)
2. Central leader-trained apple trees (two trees planted two years apart)
3. Summer-pruned stone fruit trees in the following regimes, using several species and varieties and successive ripening according to the Dave Wilson Nursery method:
 - Three and four trees per hole (18 in. and 24 in. apart, respectively)
 - High density hedgerow plantings (trees 2 and 3 ft. apart)
4. Perpendicular "V"-trained peaches and nectarines
5. Genetic dwarf peaches, nectarines, and citrus
6. Espaliered trees.

Dave Wilson Nursery donated the deciduous trees and Four Winds Growers donated the citrus trees. Additional funding was provided by Calif. Association of Nurserymen and Calif. Rare Fruit Growers. A large sign describing the training methods was erected. Contributors (including the Elvenia J. Slosson Endowment) are acknowledged on another sign at the orchard entry. Other signs show the training systems used in each location. A chain-link fence was constructed around the orchard site.

Discussion

This project has widespread community support and fits in with the District's desire for the park to serve as a horticultural teaching center. In 1998, UC Master Gardeners and the Park District organized the annual Harvest, Health and Fitness Faire (formerly the Harvest Faire), which was largely expanded that year because of the demonstration orchard. Over 100 people attended the event, at which we discussed the orchard project and gave two hands-on presentations on fruit tree care.

In a 1,000-sq. ft. space in the orchard that is to be planted to additional fruit trees in two years, Master Gardeners coordinated replicated tomato variety research trials in 1998 and 1999. In this project, five popular varieties were compared for yield, appearance, and flavor characteristics. Four additional Master Gardeners participated in the project, and the Vegetable Crops Advisor participated as well (Figure 2).

Shortly after the Harvest, Health and Fitness Faire, the orchard and tomato trials were featured in an article in the California Life section of the Sacramento Bee newspaper. As a result of this article, our office received dozens of calls from the public wanting to know when the next demonstration would be. The Master Gardeners and I decided to hold another field meeting five weeks after the initial event in order to share the results of the tomato trial and to discuss fruit tree training methods and orchard care. A total of 35 people attended this meeting.

We plan to hold two field demonstrations each year in addition to the Harvest, Health and Fitness Faire. As the trees grow and begin to bear fruit, and after the four new trees are planted, new educational opportunities will emerge, involving varietal selection, yield comparisons, pest management, and pruning.

In 1999, teams of three Master Gardeners led orchard tours for the public three times. We plan to double the number of tours in 2000 to correspond with fruit tree practices such as planting, dormant spraying, fruit thinning and summer pruning. We are currently expanding the orchard to an additional half acre. In this area, we will plant table grape and cane berry variety blocks, as well as other fruit species such as pomegranate and persimmon.

We also plan to demonstrate arboriculture, which is a unique method of bending and grafting shoots to form unusual designs and structures. We plan to create a fruit tree chair, a three-sided ladder to make the high fruit more accessible, a gazebo, fences, and other structures.



Figure 2. Master Gardeners planting tomato variety trial in space reserved for future tree planting.

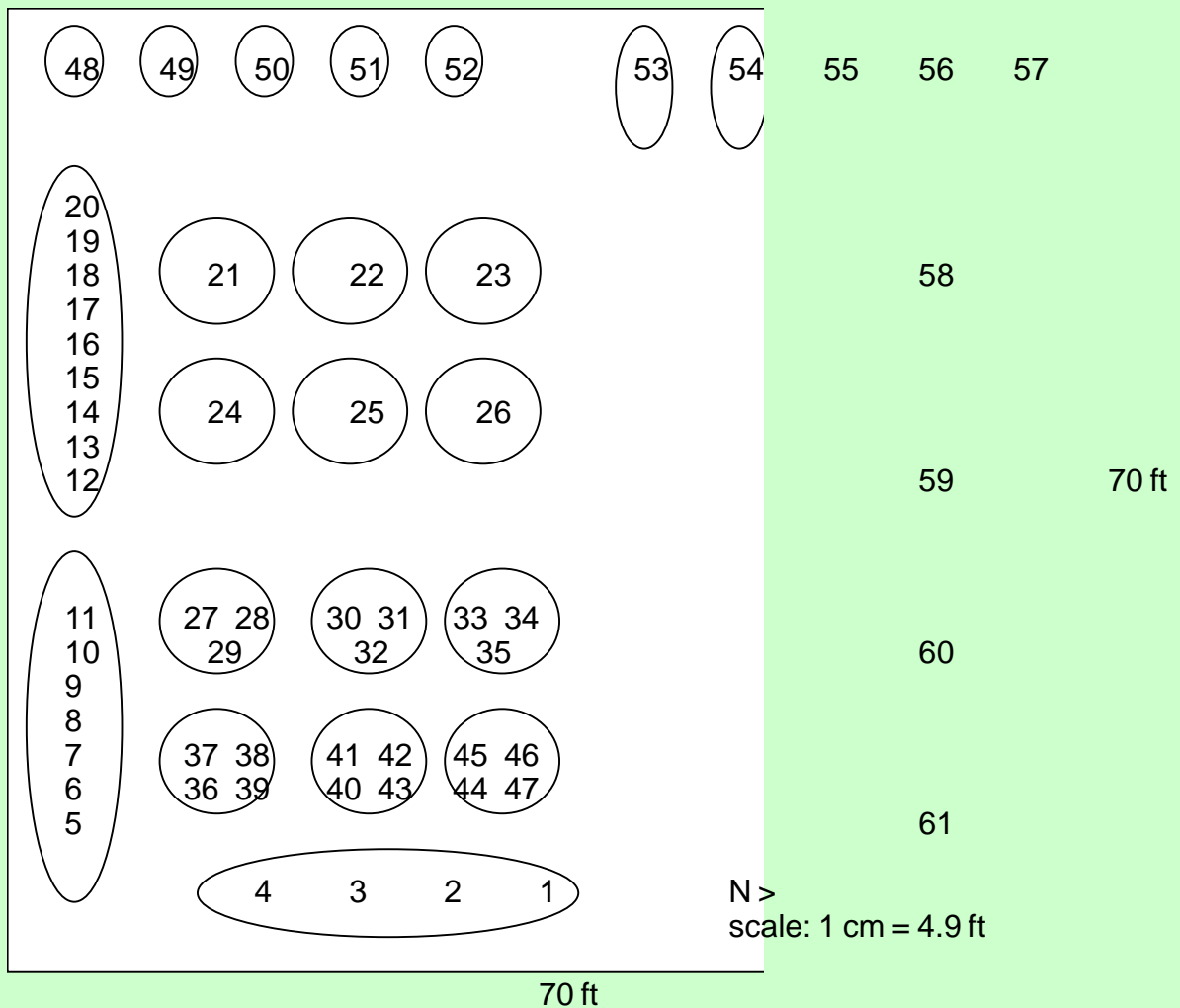


Figure 3. Planting plan for Fair Oaks Orchard Demonstration. See Table 1 for explanation of numbers.

Literature Cited

- Bethell, D. 1989. 1-2-3 Leader Training to Obtain Small Fruit Trees. University of California Cooperative Extension.
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Table 1. Varieties and planting methods used in Fair Oaks Orchard Demonstration. See Figure 2 for map.

Variety	Species	Rootstock	Variety	Species	Rootstock		
<u>Espalier</u>			<u>Three-In-One-Hole (cont.)</u>				
1	Fuji	Apple	M7	33	Tilton	Apricot	?
2	Rescue	Pear	OHXF 333	34	Flavor Delight	Aprium	Marianna 2624
3	Dapple Dandy	Pluot	Myrobalan 29C	35	Moorpark	Apricot	Myrobalan 29C
4	Black Mission	Fig	Own roots	<u>Four-In-One-Hole</u>			
<u>Hedgerow - 3 ft.</u>			36	Babcock	Peach	?	
5	Harcot	Apricot	Marianna 2624	37	Arctic Rose	W. Nectarine	Lovell
6	Blenheim	Apricot	Myrobalan 29C	38	Santa Rosa	Plum	Myrobalan 29C
7	Beauty	Plum	Myrobalan 29C	39	Dapple Dandy	Pluot	Myrobalan 29C
8	Emerald Beaut	Plum	Nemaguard	<u>Four-In-One-Hole</u>			
9	Laroda	Plum	Citation	40	Wenatchee		
10	Flavor Supreme	Pluot	Myrobalan 29C		Moorpark	Apricot	Myrobalan 29C
11	June Glo	Nectarine	Lovell	41	Harglow	Apricot	Marianna 2624
<u>Hedgerow - 2 ft.</u>			42	Tomcot	Apricot	Marianna 2624	
12	Rainier	Cherry	Colt	43	Harcot	Apricot	Marianna 2624
13	Bing	Cherry	Colt	44	Shinseiki	Asian Pear	OHXF 97
14	Fantasia	Nectarine	Lovell	45	D'Anjou	Pear	Pear
15	Strawberry Free	Peach	Lovell	46	Bartlett	Pear	Pear
16	Flavor Queen	Pluot	Myrobalan 29C	47	Gravenstein	Apple	M111
17	Flavor King	Pluot	Myrobalan 29C	<u>Citrus</u>			
18	Satsuma	Plum	Myrobalan 29C	48	Wash. Navel	Orange	Cuban
19	Beauty	Plum	Myrobalan 29C	49	Lane Late Navel	Orange	Cuban
20	Royal Rosa	Apricot	Myrobalan 29C	50	Minneola	Tangelo	Trifoliolate
<u>Dwarf Peaches / Nectarines</u>			51	Valencia	Orange	Cuban	
21	Pix Zee	Peach	Nemaguard	52	Owari Satsuma	Mandarin	Cunningham (dwarfing trifol.)
22	Honey Babe	Peach	Nemaguard	<u>Perpendicular "V"</u>			
23	Nectar Babe	Nectarine	Nemaguard	53	Rio Oso Gem	Peach	?
<u>One-In-a-Hole</u>			54	White Lady	W. Peach	Lovell	
24	Blenheim	Apricot	Myrobalan 29C	55	Mericrest	Nectarine	Lovell
25	O'Henry	Peach	Lovell	56	Red Haven	Peach	Lovell
26	Hosui	Asian Pear	Calleryana	57	Arctic Glo	W. Nectarine	Lovell
<u>Three-In-One-Hole</u>			<u>Standard</u>				
27	Double Delight	Nectarine	Lovell	58	Fuji	Apple	M111
28	Royal Gold	Peach	Nemaguard	59	Lapins	Cherry	Colt
29	Arctic Supreme	W. Peach	Lovell	60	O'Henry	Peach	Lovell
30	Santa Rosa	Plum	Myrobalan 29C	61	Blenheim	Apricot	Myrobalan 29C
31	Flavor Queen	Pluot	Myrobalan 29C				
32	Elephant Heart	Plum	Myrobalan 29C				