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Training and Pruning Italian Prune Trees

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AN experiment carried on over a period of 14 years in Idaho has shown that a very simple system of training and pruning Italian prune trees has so far produced greater yields than any of five more complicated systems. This experiment, begun in 1946, was conducted at the Parma Branch Experiment Station in the Boise Valley. The orchard was grown under irrigation.

Methods

The trees planted were 5- to 6-foot, 1-year old whips. Originally there were 10 trees per treatment, but in some instances this number was reduced to 8 or 9 trees as a result of loss or damage in no way related to the treatments. The trees in the several treatments were trained according to the directions briefly outlined below:

No. 1. Cut whips back to 36 inches after planting; no selection of scaffold branches and no further training cuts of any kind.

No. 2. Cut whips back to 36 inches after planting; first winter select 5 scaffold branches; thereafter keep all interscaffold growth removed from the trunk.

No. 3. Cut whips back to 36 inches after planting; first winter select 5 scaffolds; thereafter suppress, but do not remove, interscaffold growth.

No. 4. (Deshooting) Cut whips back to 48 inches after planting; when shoots are 3 to 4 inches long select 5 for scaffolds; thereafter keep all interscaffold growth removed.

No. 5. Cut whips back to 48 inches after planting; first winter select 5 scaffolds; thereafter keep all interscaffold growth removed.

No. 6. Cut whips back to 48 inches after planting; first winter select 5 scaffolds; thereafter suppress, but do not remove, interscaffold growth.

PRUNING AFTER THE FIRST YEAR

In Treatment No. 1 a minimum of pruning has been done since planting. Only a very few seriously crowding branches have been removed. There has been little "detail" pruning; that is, thinning out

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of small branches, and no heading back of leaders or other growth. Trees in this treatment may be regarded as virtually unpruned except for the initial heading back to 36 inches.

In all other treatments, pruning after the first year has consisted of removal of crowding branches, a light thinning of wood throughout the trees, and occasional heading back of leaders that had grown undesirably high.

In Treatment Nos. 2, 4, and 5, any growth appearing on the trunk between scaffold branches was removed at each annual dormant pruning. In Treatments Nos. 3 and 6, such growth was not removed but was suppressed by moderate to severe heading back at each dormant pruning.

Results

As may be seen by the data in Table 1, the trees under Treatment No. 1 produced substantially more fruit than those in any other treatment. For the 10-year period covered by the data, Treatment No. 1 outyielded the next best treatment (No. 6) by 14 percent. This difference is statistically significant at the 5 percent level. There were no statistically significant differences in yields among Treatments Nos. 2 to 6, inclusive.

With respect to yields, these results agree with those of many similar experiments in training and pruning of other fruit trees. It has become axiomatic through such experiments that the least severe pruning will result in the greatest production of fruit. Unfortunately, in most fruits the very light pruning that leads to the highest yields usually is accompanied by various undesirable effects. The fruit is likely to be small and the trees often become too dense for effective spraying. With many fruit trees, when little or no attention has been given to the selection of scaffold branches these are likely to become crowded and to have weak crotches.

Contrary to expectation, these unfavorable aspects of light pruning were found to be of little consequence in the experiment here considered. Repeated tests throughout the period of the experiment have shown no significant differences in size, quality, or time of maturity of the fruit in Treatment No. 1 as compared with any of the other treatments. (See Table 2.) So far no serious structural weaknesses have appeared in the trees in Treatment No. 1.

It is entirely possible that some structural weaknesses may develop in these trees in years to come because of inadequate spacing of the scaffold branches, and that in the later life of the orchard the trees with spaced scaffold branches may prove superior both in form and production. However, all systems used in this experiment have resulted in reasonably satisfactory tree structure to date.

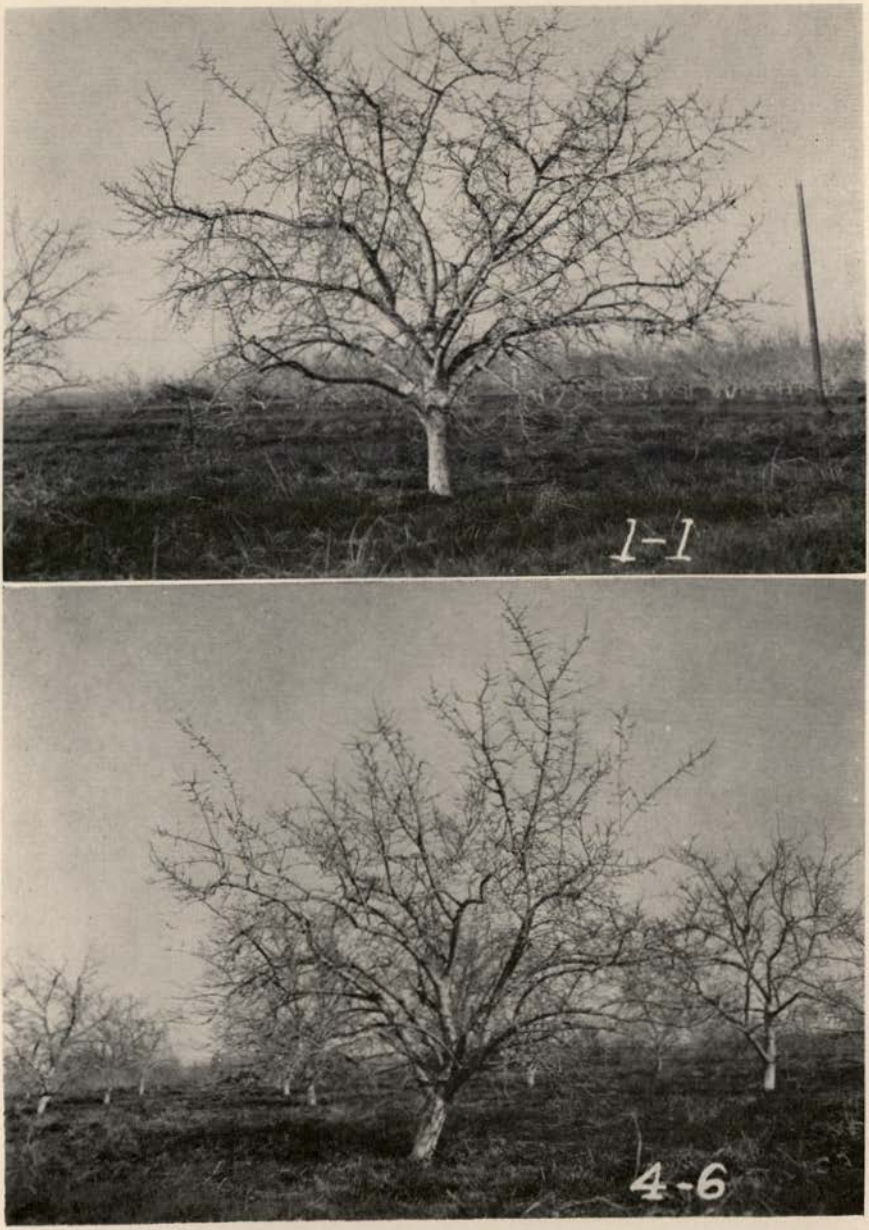

Figure 1. Trees in Treatment No. 1. Tree 1-1 is representative of the best trees, structurally, and 4-6 is representative of the poorest trees, structurally, in this treatment. Ten-year yields were:—Tree 1-1, 1928 lb.; tree 4-6, 2077 lb.; average for treatment, 1999 lb.

Figure 2. Trees representative of those in Treatments No. 2 to 6, inclusive. Tree 2-3 is from Treatment No. 2, and tree 3-3 is from Treatment No. 3. Ten-year yields were:—tree 2-3, 1691 lb.; average for Treatment No. 2, 1679 lb.; tree 3-3, 1668 lb.; average for Treatment No. 3, 1698 lb.

With respect to fruit production, the data in Table 1 show that the yields in some treatments slightly exceeded those of Treatment No. 1 in the later years of the experiment. This shows that the recent upward trend in yields in such treatments has been somewhat greater than in Treatment No. 1. It is conceivable that such a trend may continue and that in the later life of the orchard the total accumulated yields may be greatest for one of the other treatments. However, since a lead of 14 percent in **accumulated** yields for a 10-year fruiting record would not likely be overtaken in a short time, the trees in treatment No. 1 probably will continue to lead in total accumulated yields for some time to come. Continuation of the experiment for several years may be necessary to resolve this question.

In older Italian prune trees it has been observed that heavy shading due to denseness of growth results in weak and dying wood. Fruit produced in such dense shade in old trees has been often found to be low in quality, as evidenced by softness, low soluble solids content, and above-average incidence of internal browning. Although such difficulties have not yet become apparent in the trees in this experiment, it appears likely that the trees in Treatment No. 1 will, beyond the present age of 14 years, require a moderate, annual thinning out of small branches in the denser portions of the trees. In a few instances in Treatment No. 1 (as in tree 4-6, Figure 1) removal of 2 or 3 of the larger, crowding branches might be beneficial.

The fact that Italian prune trees have responded so much more favorably than trees of most kinds of fruit to a program of exceedingly light pruning is possibly accounted for by two characteristics of that variety: namely, (1) its excellent natural tree form, which assures well-developed trees under a wide variety of training systems, and, (2) its characteristic of self-thinning, which forestalls an overload of fruit even on unpruned trees. In commercial practice fruit thinning of Italian prunes seldom, if ever, is necessary.

Summary

Fourteen-year-old Italian prune trees that have received no training beyond heading back to 36 inches at time of planting, and no pruning except removal of seriously crowding branches, have outyielded by 14 percent or more those that have been trained and pruned by 5 other systems that involved selection of spaced scaffold limbs and annual, light detail pruning.

Table 1. Average yields in pounds of prunes per tree at different ages.

Treatment No.	No. Trees	Age of trees in years since planting										10 Year total yield
		4	5	6	7	8	9	10	11	13	14	
1	8	42	42	195	206	212	182	189	347	261	322	1998
2	9	21	31	116	166	183	153	199	296	259	254	1678
3	9	24	33	124	153	172	146	202	286	251	307	1698
4	10	15	25	136	168	198	160	226	286	217	296	1727
5	8	27	22	106	120	175	152	197	349	208	345	1701
6	9	19	20	130	167	190	148	194	322	233	329	1752

Table 2. Yield, size and maturity data on random samples of prunes from 5 trees in each of two training systems. 1958.

Treatment No. 1					Treatment No. 4				
Tree No.	Yield (lb.)	Firmness (lb.)	% Soluble solids	Wt. of 75 prunes (ounces)	Tree No.	Yield (lb.)	Firmness (lb.)	% Soluble solids	Wt. of 75 prunes (ounces)
1	236	7.4	18.0	74	1	206	7.0	17.9	73
2	237	7.0	17.6	76	2	226	7.0	18.0	73
3	223	7.2	18.3	75	3	231	7.6	18.1	74
4	253	7.2	17.5	75	4	205	7.3	18.3	77
5	250	8.0	17.6	83	5	213	7.5	18.3	82
Av.	240	7.4	17.8	77	Av.	216	7.3	18.1	76

SOME OTHER UNIVERSITY OF IDAHO PUBLICATIONS OF INTEREST TO FRUIT GROWERS

Hormone Relations in the Growth and Training of Apple Trees, Exp. Res. Bul. 28.

Idaho Fruit Varieties, Ext. Bul. 300.

Cytospora Canker of Prunes, Exp. Bul. 254.

Fireblight of Apples and Pears, Ext. Bul. 261.

Growing Strawberries in Idaho, Ext. Bul. 182.

Latent Viruses in Stone Fruit Trees, Exp. Bul. 260.

Little Cherry and Western X Disease in Cherries and Peaches, Exp. Bul. 259.

Powdery Mildew in Idaho Orchards, Exp. Bul. 221.

Small Fruit Diseases and Their Control, Exp. Bul. 219.

The Idajon Apple, Exp. Cir. 114.

The Lamida, Ebony, and Spaulding Sweet Cherries, Exp. Cir. 109.

The Strawberry Root-Rot Problem, Exp. Cir. 124.

Vegetative Propagation of Plants, Ext. Cir. 95.

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