Sustaining Yields in Hedgerow Almonds

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The long term evaluation of various tree spacing, training and pruning techniques continued into the 22nd year. Since 1979 four training concepts have been monitored for there affect on yield of Nonpareil; in a Nonpareil:Price 1:1 hedgerow planting (7'x22') at the Nickels Soils Lab in Arbuckle. The following treatments began at the first dormant pruning:

1) **Temporary Hedge** – trained to three scaffolds, standard pruning for permanent trees, with alternate trees gradually whisked back and then removed after their 8th year (1986), leaving a 14'x22' spacing.

2) **Permanent Hedge** – trained to three scaffolds, standard pruned and maintained at 7'x22'.

3) **Two Scaffold Hedge** – a 7'x22' hedge trained with two primary limbs growing out into the row middles and standard pruned.

4) **Unpruned Hedge** – a 7'x22' hedge trained to three scaffolds and then essentially unpruned.

Results

This test is now in an observation phase when plots are not harvested individually and only tree condition is monitored periodically. Shading of lower and mid canopy fruitwood has progressed resulting in little or no crop produced in the lower canopy except in the wider spaced Temporary Hedge plots.

Accumulative yields for the Temporary 14' x 22' Hedge through 1999 (21st leaf) lagged far behind all 7'x 22' hedgerows (Table I). Trunk size measurements taken periodically show larger trunk circumference for the Temp trees compared to all other training methods. (Table 2) The continued low yield from the Temporary Hedge suggests that alternate tree removal is a questionable practice, even in tightly spaced hedgerows. Even if the wider hedge trees would begin to regain productivity, it is too late to compensate for heavy early losses. However, due to tight adjacent row spacing, the Temp plot trees were more shaded than normal after alternate trees were removed which may have reduced their regrowth and limited cropping.

Tightly spaced almond hedgerows appear to be quite forgiving with respect to pruning/training methods. Yearly and accumulative yields show no difference between trees pruned to Two-Scaffolds, Permanent (3-scaffolds) or left Unpruned (after 3 scaffolds established).

We know of no other experimental data that shows unpruned almonds to produce yields

equal to standard pruned trees over this length of time. Excessive overgrowth and shading did not occur until year 20. Now all 7'x22' treatments are heavily shaded. Unpruned trees are leaning severely to the south from strong north winds and have no fruitwood in the lower 9-10 ft of canopy. However, the sustained productivity of the Unpruned Hedge merits consideration when planning a pruning program for almond hedgerows. Our savings, in pruning costs over the span of this trial were considerable. Another field test is in progress to validate the productivity of the nonpruned method.

TABLE I. YIELDS BY HEDGEROW SYSTEMS

Kernel Pounds per Acre
Leaf/Year

Treatment	3rd 1981	4th 1982	5th 1983	6th 1984	7th 1985	8th 1986	9th 1987	10th 1988	11th 1989	12th 1990	13th 1991	14th 1992	15th 1993	16th 1994	17th 1995	18th 1996	19th 1997	20th 1998	21st 1999	Accum.[1/] 1981-99
2 Scaffold	151	575	302	2348	1100	1300	2937 a	1678 ab	3076 a	3887	3351	2329	2176	3175	1790	3324	3307	2572	2781	41,238 a
Unpruned	239	726	258	2016	1085	1308	2771 a	1821 ab	3215 a	3441	3400	2768	2020	3135	1360	3173	3002	2193	2584	39,292 a
Permanent	258	816	239	2258	1109	1824	2483 a	2164 a	3002 a	3733	2525	2540	1332	2999	1453	2939	2798	2793	2392	28,277 a
Temporary	233	635	297	1875	946	1532	1465 b	1465 b	2292 b	2744	2885	1948	1434	2742	1208	2325	2331	1968	1861	31,204 b

P = 0.05

[1/] Accumulative Yields Since 1981

TABLE 2. ALMOND HEDGEROW

TRUNK CIRCUM. (CM)

Treatment	1994	2000
2 Scaffold	66.3 a	78.4 a
Unpruned	64.6 a	74.1 a
Permanent	66.5 a	77.3 a
Temporary	76.3 b	90.4 b
	P=0.01	P=0.01