MANAGEMENT SYSTEMS FOR HIGH DENSITY WALNUT ORCHARDS

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ABSTRACT

In an attempt to develop a more efficient high density management system, Chico walnut trees were planted in 1974 in hedgerows (22' x 11'), trained into a fruiting wall and mechanically pruned since 1978. For comparison, plots also were established with trees at 22' x 22' and hand pruned. The hedgerowed trees have been mechanically pruned with a vertical boom hedging machine, positioned to cut about 4 feet from the trunk. The tree height is being maintained at about 25 feet by mechanical topping. Two hedging treatments have been compared: (1) shearing both sides of wall each year, and (2) shearing opposite sides of wall each year (alternate year hedging). The yields of the hedging treatments from 1977 through 1980 doubled that of the standard spaced and pruned trees. This was to be expected since yield tends to be a function of tree numbers in this initial period. In 1982, the yields of the hedgerowed trees exceeded 3 tons per acre and the standard planting was 2-1/3. The size and yield of individual trees in the standard planting were greater than in the hedgerows, indicating that the advantage of tree numbers is diminishing as the conventional trees enlarge, as would be expected. Additional research is needed to determine: (1) the best hedging procedure for this type of planting, (2) closest row spacing possible, and (3) which cultivars are adaptable to this system.

OBJECTIVE

To develop more efficient high density management systems for early production and sustained high yield of walnuts. Examine pruning systems and how they influence tree physiology and productivity. Determine adaptability of various walnut cultivars and proper tree spacing for hedgerow plantings.

PROCEDURE

The two hedging treatments initiated in 1978 in the Chico trial near Vina were maintained in 1982 (one side hedged vs. two sides hedged). In addition, a third hedging treatment was initiated which will consist of hedging each side of the tree wall every third year. Thus, the new growth produced in response to the hedging is allowed to bear crops for two successive seasons before it is rehedged. In this way, the long shoots extending from the tree wall would bear nuts the first year on lateral shoots whereas on the second year, they would be borne on one-year-old spurs. This treatment may have the potential to increase yield provided that problems associated with reduced nut size, sunburn or shading of interior fruitwood are not encountered.

Two variety trials involving hedgerow planting have been established. One is in Tulare County in cooperation with Farm Advisor Steve Sibbett with a 10' x 20' tree spacing. The trees were planted last spring and will be
whipgrafted in spring 1983. The other trial is a 24' x 12' planting near Winters. The cultivars under test in these plantings include the following: Serr, Payne, Ashley, Sunland, Chico, Vina, Amigo, Howard, Pedro, Chandler, 67-13, 68-104, 67-11, and 66-178. A third trial under consideration involves several of these varieties planted in hedgerows at different row and tree spacings.

RESULTS AND CONCLUSIONS

The yields obtained from the Vina hedgerow trial in 1982 were as follows: hedged one side 6,084 lbs. per acre, hedged 2 sides 6,066 lbs. per acre, conventional spaced hand pruned 4,671 lbs. per acre. The data indicate that the standard spaced and pruned trees are yielding more on an individual tree basis than the hedgerowed trees but the yields per acre are still significantly greater with the hedgerowed treatments because of greater tree density. It is interesting to note that there is no significant difference in yield between the two hedgerowed treatments even though the unhedged side of the alternate year hedging treatment continues to out-yield the side which is hedged. This suggests that the amount of nuts produced in the interior part of the tree wall is less with the alternate year hedging than on the trees hedged on both sides every year. A possible explanation might be increased shade of interior spurs as a result of allowing one side of the tree wall to remain unhedged each year. This aspect needs to be evaluated further and will be critically looked at in the 1983 season. Nut quality data for 1982 is not yet available, but analysis of the data from years 1978 through 1981 showed no significant difference between any treatments in percent light colored kernels, relative light index or total edible kernel percent.