UTILIZATION OF FERTILIZER NITROGEN BY WALNUT TREES - 1984

S. A. Weinbaum, P. B. Catlin, F. E. Broadbent,
T. T. Muraoka, and K. Kelley

ABSTRACT

Nitrogen test plots have been initiated in Oakdale using two cultivars; 'Serr' growing in a Hanford sandy loam and 'Hartley' growing in a Tajunga loamy sand. Two treatments are being established: (a) well fertilized control trees will receive an application of isotopic N fertilizer in late January-early February, and (b) N-deficient trees which will be studied to identify yield-related parameters sensitive to nitrogen deficiency in walnut. Our choice of light textured soils to expedite the acquisition of relevant data appears to have been justified as we are already seeing an apparent difference between treatments in the 'Serr' orchard. Leaf senescence and abscission as well as cessation of trunk growth occurred earlier in the non-fertilized trees as compared to the tree receiving adequate nitrogen.

OBJECTIVES

1. Identify and rank yield-related parameters sensitive to nitrogen deficiency in walnut.
2. Quantitate recovery of fertilizer N by the walnut crop.
3. Evaluate the dependence of early season vegetative and reproductive growth in walnut on current N uptake from the soil (as opposed to previously assimilated storage N).

PROCEDURES

Two experimental plots have been initiated at Oakdale. An 8 year old 'Serr' orchard (E. Waggoner, owner) on Hanford sandy loam and a 10 year old 'Hartley' block (J. Brichetto, owner) growing in Tajunga loamy sand have been selected, and two treatments are being established within each orchard. A well fertilized (control) group of trees is being maintained and will receive an isotopic N application in late January ('Serr') and early February ('Hartley'). Nitrogen is being withheld from a second group of trees. Intensive sampling and analyses will be conducted to meet our various objectives.

RESULTS

Baseline yields and crackout data ('Serr' orchard only), assessment of pistillate flower drop, leaf N, and trunk cross sectional area have been obtained. We have observed an apparent difference in N status among the fertilized and nonfertilized 'Serr' tree as early as November 1984. This difference was manifested as premature leaf yellowing and abscission as well as earlier cessation of trunk growth in autumn on the nonfertilized trees.
CONCLUSIONS

The project is proceeding on schedule and we anticipate that the first substantive conclusions will be forthcoming at the end of the next harvest year.