WEED CONTROL IN WALNUTS

R. G. Snyder, D. M. Holmberg, W. H. Olson and C. L. Elmore

OBJECTIVE:

Develop information in three specific areas as follows: 1) Generate efficacy data on newly identified herbicides, evaluate these materials for phytotoxic reaction on walnut trees, and gather residue data for potential registration of the most beneficial herbicides; 2) Devise more efficient and economical methods for use of presently registered herbicides; and, 3) Provide demonstrations for grower education at treatment sites.

PROCEDURE:

Five registered and seven unregistered or partially registered herbicides were selected for evaluation on annual and perennial orchard floor vegetation. Treatment sites were selected in Butte, Solano and Yolo providing a variation of soil characteristics, climatic conditions and weed species. Second to fourth leaf trees of either Ashley, Chico, Gustine, Hartley or Seer varieties established on both Paradox and California Black Walnut rootstocks were identified for treatment to maximize phytotoxicity evaluations. Treatments were applied to single tree, strip plots randomized within four replication blocks. Pre-emergence herbicides (diuron, napropamide, norflurazon, oryzalin, oxadiazon, oxyfluorfen, prodiamine, and simazine) were evaluated for annual and perennial weed seedling control. Postemergence herbicides (dalapon, glyphosate, MSMA, and 2,4-D [OSA]) were evaluated for control of perennial weed structures. In addition, a combination of preemergence and translocating postemergence herbicides was compared to postemergence herbicides applied singularly. Weed control efficacy was rated by weed species at intervals of two, four and eight months. Simultaneously, the walnut trees were evaluated for herbicide induced phytotoxicity. Fruiting structures were taken at harvest for residue analysis.

RESULTS:

The simazine plus diuron treatment, a registered combination and considered a comparative standard for this study, equalled or exceeded the performance of the other preemergence herbicides. Oxyfluorfen demonstrated excellent broadleaf weed control, especially on malva
which previously exhibited partial herbicidal tolerance. This material was the only herbicide to produce postemergence and preemergence herbicidal effects in this study. Norflurozon and prodiamine were as effective as the standard. The herbicidal activity of oxadiazon was comparable to the standard with the exception of the tolerance of chickweed. The remaining herbicides were less effective than the preemergence standard. The surflan plus glyphosate combination provided excellent johnsongrass, dallisgrass, bermudagrass and field bindweed control greatly exceeding the other treatments evaluated. Herbicidally induced phytotoxicity on the walnut trees was not produced by any of the treatments.

CONCLUSIONS:

Supportive efficacy and residue data generated in this study contributed to the full registration of oryzalin and oxyfluorfen. Evidence to support possible registration of oxadiazon and prodiamine was accumulated. The herbicide program combining oryzalin and glyphosate was demonstrated as a superior treatment for perennial weeds. Finally, walnut growers were provided a site for educational observation of potential weed control solutions.