

Response of Walnuts to Simulated Drift of Rice Herbicides.

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English walnut is one of the top commodities grown in California and its importance has been increasing in the last decade, with a gross dollar value of \$1.36 billion in 2012. In the Sacramento Valley, walnut orchards often are in close proximity to rice fields. Therefore, herbicide applied to rice may drift on walnuts and cause injury. The majority of rice herbicide applications are made by airplane between the end of May and early July. This time frame coincides with a period of rapid growth for walnut trees as well as flower bud initiation for the subsequent year's crop. Two simulated herbicide drift field studies were established at the UC Davis research station to evaluate the symptoms and growth effects of rice herbicides on young walnut trees. In the first study, the effect of three commonly used rice herbicides were studied: bispyribac, bensulfuron and propanil. Each herbicide was applied at four simulated drift rates: 0.5%, 1%, 3% and 10% of the high use rate in rice (44.8, 70.2, and 6725.1 g ai/ha for bispyribac, bensulfuron and propanil, respectively). All three herbicides caused significant damage and delayed growth of young walnut leaves and shoots with the maximum symptoms observed 28 days after treatment. At one month after treatments, walnuts started recovering, although symptoms were still evident in late October. In a separate study, bispyribac was applied four times at weekly intervals at two different rates: 0.5% and 3% of the rice use rate. Bispyribac-sodium, at both rates, caused significant symptoms to walnuts leaves and growth delay of young shoots. Symptoms were still readily observed in late October, more than four months after the last simulated drift event. The effects of these treatments on walnut yield and quality are being evaluated in ongoing experiments.