Section V
Harvesting, Hulling and Dehydration

Etphephon as a Harvest Aid -- Use of Adjuvants to Increase Etphephon Activity

George C. Martin

The adjuvants Glyodin and Chlorothalonil were added to 250 ppm ethephon and applied to Ashley walnut at PTB. Each adjuvant at 1/2 pint per 100 gallons of water with 250 ppm ethephon was as effective as 500 ppm ethephon without adjuvant in inducing hull dehiscence.

Harvest Handling

G. S. Sibbett, G. C. Martin, and M. Draper

Kernel Quality and Percent Moisture as Affected by Harvest Delay in Etphephon Treated and Untreated Ashley Walnut

In 1976, a test was initiated to determine kernel quality loss and percent kernel moisture following optimum harvest date for ethephon treated and untreated Ashley walnuts.

Etphephon treated nuts were harvested 10 days after application (8/30) and twice per week up to 25 days following treatment. Control nuts were harvested at the normal time (9/6) and twice per week until normal second picking, 10 days later. Kernel quality and percent moisture were monitored on each harvest date.

On the optimum harvest date, ethephon treated nuts contained 39.9% moisture. On the second to last harvest date, 10 days later, nuts from the same trees contained 20.9% moisture. On the last harvest date, 15 days later (following rain), nuts increased in moisture content to 27.5%. Control nuts initially contained 37.3% moisture and on the last harvest date, 10 days later, contained 30.9% moisture. Kernel color declined more rapidly in ethephon treated nuts than in controls. Mold also increased to higher levels, but insect damage, navel orangeworm, did not increase as rapidly, probably due to coincidence of the flight with condition of hull split.

Effect of Prolonged Drying on Walnut Kernel Quality

A test was developed to determine effect of prolonged drying on kernel quality. No difference in kernel quality existed if nuts were left up to 48 hours in the drier at 107°F following normal drying time. Kernel quality seemed to deteriorate following 48 hours in the drier.
Effect of Hull Condition on Drying Time and Kernel Quality

To supplement the test of effects of ethephon and harvest delay on percent moisture, a test was developed to determine moisture content of nuts with intact and dehisced husks. Little difference in drying time existed at optimum harvest date between nuts having completely intact husks when compared with those partially split. Kernel quality was substantially less from dehisced hull kernels, 16.4% light meat in contrast to 34.9% light kernels from nuts with intact hulls. Mold and insect damage were also substantially higher when husks were dehisced.

Walnut Dehydration Trials - 1976

James F. Thompson

The walnut dehydration trials completed this year were designed to determine what proportion of heat from the fuel is actually used for drying and how the rest of the heat is lost. A knowledge of the heat flow characteristics in a walnut dehydrator will provide a basis for understanding how to conserve energy in this operation.

Results to date have shown that only about 1/4 of the heat from the fuel is used for removing moisture from the walnuts. Almost 1/2 of the heat is expelled in hot air that leaves the bin during drying. Other investigations have shown that a well adjusted burner loses 20% of the potential heat supplied to it. Heat lost through the walls of the bin was calculated to be only about 5% of the total heat input.

These results point out that the energy conservation investigations should be directed toward understanding burner efficiency and determining how some of the heat exhausted from the drying bins can be reused. Preliminary work this fall indicated that recirculating some of the exhaust air back through the burner may be a good method of saving energy. Investigations will be continued next year into this and other possible means of energy conservation.

Walnut Hull Disposal

G. S. Sibbett and J. H. LaRue

During harvest of 1974 an experiment was developed to find alternative methods of walnut hull disposal rather than piling and ponding. In this replicated test, hulls were spread in three crops (nectarines, walnuts, and persimmons) and compared with piled hulls for house fly populations. House flies were eliminated by spreading hulls. Soil samples of treated vs. untreated soils were monitored to determine if any adverse affect of continued hull spreading on soil chemistry and tree growth occurs. No adverse affects of annual spreading of hulls has been observed in trees or determined from soil analysis.