

Use Of Ethrel In Mechanical Harvesting Of Schmidt Sweet Cherries

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About 900 Michigan fruit growers now possess equipment for mechanically harvesting tart cherries. Use of the equipment for harvesting also sweet cherries is becoming increasingly desirable.

The principal obstacle to mechanizing Michigan's sweet cherry harvest has been the difficulty of separating the fruit from the tree. About 80 percent of the crop, mostly Napoleon and Windsor varieties, is harvested prior to full maturity when stems are tightly attached to the fruit. Accordingly, recoveries of only about 75 percent during mechanical harvest have been realized. Recently, however, a chemical (Ethrel), that loosens the fruit on the tree, has been developed and tested. Use of the chemical with Emperor Francis and Windsor varieties resulted in recoveries of about 90 percent.

A significant proportion (about 17 percent) of the Michigan sweet cherry crop is comprised of the Schmidt variety, used mostly for canning in syrup. Since the Schmidt cherry is relatively loosely attached to the tree, most of the crop at present is harvested mechanically. With the impending availability of Ethrel, growers now want to know what its effect on Schmidt cherries might be.

The Study

A group of young Schmidt trees in an orchard near Kewadin was sprayed with 500 parts per million of Ethrel (2-chloroethylphosphonic acid) on July 18, 1969. A similar group of trees was not treated. After one week all trees were harvested mechanically in a standardized way. Data on fruit removal force, recovery of fruit, and quality were obtained, and samples were hot packed in syrup in a cannery to determine the processing characteristics.

Effect of Ethrel on fruit removal force of fresh Schmidt Cherries, and on drained weight of the unpitted cherries canned in syrup.

Tree	Ethrel treatment	Fruit removal force, grams	Drained weight after processing, %
1	None	640	94.8
2	None	457	93.3
3	None	455	94.3
Average		517	94.1
4	Treated	470	94.1
5	Treated	367	92.9
6	Treated	416	95.0
Average		418	94.0

Results

Treatment of the trees with Ethrel reduced the force required to remove fruit by an average of 19 percent in one week (from 517 grams to 418 grams; see Table). The reduction, however, was less than that (40-50 percent) obtained with Windsor and Emperor Francis cherries, and was not statistically significant. At the same time, the treatment increased the average recovery of the Schmidt cherries during mechanical harvest by 4.1 percent (not statistically significant). The treated trees released their fruit relatively quickly. Prolonged shaking was not required, bruising of fruit was reduced, and more trees per hour could be harvested. Ethrel treatment caused no premature drop of fruit and no defoliation.

The results indicate that Ethrel would be particularly useful with relatively large, difficult-to-harvest trees, and would increase the effectiveness of relatively light-weight shaking equipment.

The value of a new treatment cannot be fully assessed until its effect on the final product is determined. Fortunately, the

processing behavior of the cherries was not changed by Ethrel treatment. No new processing methods or equipment were required, drained weights (processed yields) were high (94.1 percent for untreated, 94.0 percent for treated), and quality was maintained.

Clearance

Ethrel promotes abscission by supplying ethylene, a nontoxic ripening agent that occurs naturally in the tissues of most fruits. At present, Ethrel has not been cleared by Food and Drug Administration for commercial use. The necessary steps for clearance, however, have been taken, and expectations are that clearance will be granted in the future.

Conclusions

1. Spraying Schmidt cherry trees with Ethrel reduced the force required to remove the fruit, increased slightly the recovery of fruit during mechanical harvest, and shortened the required shaking time.
2. Ethrel had no objectional side effects on fruit or tree.
3. Ethrel-treated cherries gave high processed yield and high quality when canned in syrup.