# Tart Cherry Research



## Soft Cherry

**Soft tart cherries, a problem in the major production areas of Michigan, results in significant financial losses to growers. Many factors such as soil type, growing area, crop load, temperature, and maturity may contribute to soft tart cherries. Gibberellic acid (GA) is extensively used in fresh sweet cherry production to increase fruit size and firmness. However, it is not known whether GA applications at this timing (approx. 2 weeks before harvest) will promote fruit firmness in tart cherries.**

**Three commercial orchards on the Leelanau peninsula which have had problems with soft tart cherries in the past were chosen for preliminary research. Uniform, heavily-cropped trees were flagged in a randomized design (Figure 1) and GA applications of 4 concentrations and 2 timings were applied (Table 1).**

Figure 1. Uniform, heavily-cropped orchards with a history of soft cherry problems were chosen for GA research.

Table 1. Application rate and timing of GA treatments applied to tart cherry trees. Treatments 4 (Purple) and 6 (Orange) were split applications. The first GA application of 20 ppm was applied 16-18 db harvest, and the second application of either 20 or 10 ppm (6-8 db harvest) following ethephon sprays by growers.

| Treatment | Application Rate | Application Time |
|---|---|---|
| Control (White) | Untreated | Untreated |
| 2 (Blue) | 20 ppm | 16-18 db harvest |
| 3 (Red) | 30 ppm | 16-18 db harvest |
| 4 (Purple) | 20 ppm / 10 ppm | 16-18 db harvest / 6-8 db harvest |
| 5 (Pink) | 40 ppm | 16-18 db harvest |
| 6 (Orange) | 20 ppm / 20 ppm | 16-18 db harvest / 6-8 db harvest |

**The first GA applications were made 16-18 days before harvest in 2001 using a handgun powered sprayer. Spray was applied to the entire tree until run-off. For the treatments consisting of split applications, the second GA application was made following grower applied ethephon sprays but 6-8 days before harvest. At the grower-determined harvest date, 200 fruit samples were taken from each treatment tree and transported on ice to the Northwest Michigan Horticultural Research Station. For each sample, pull force, soluble solids, fruit weight, fruit color, fruit firmness, and textural analysis were measured. Subjective textural analysis was performed after simulated mechanical harvesting ("drop test") to determine the percentage of soft fruit from each sample (Figure 2).**

Figure 2. Simulated mechanical harvesting of fruit from GA growth regulator trials. The drop test approximates the fall of fruit from the tree onto belts from mechanical harvesters for laboratory analysis.

**There were no measurable differences between the control and treated fruit for color at harvest time, and no consistent differences in pull force, soluble solids content, or fruit weight. All GA treatments had a greater percentage of fruit classified as good after simulated mechanical harvest (Figure 3, Table 2) although this varied by location. Split applications appeared to decrease the percentage of soft fruit the most.**

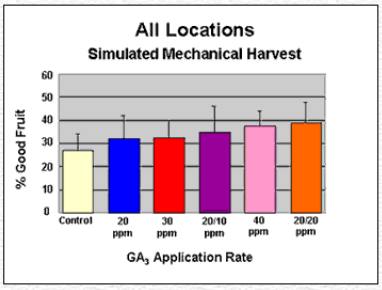


Figure 3. Percentage of good fruit averaged from all locations after GA applications and simulated mechanical harvesting

Table 2. Percentage increase in good fruit compared to untreated trees after GA application and simulated mechanical harvest.

| Rate (ppm) | Site 1 | Site 2 | Site 3 | Average |
|---|---|---|---|---|
| 20/0 | 3 | 17 | 33 | 18 |
| 30/0 | 39 | 18 | 39 | 32 |
| 20/10 | 47 | 18 | 47 | 37 |
| 40/0 | 12 | 17 | 50 | 26 |
| 20/20 | 33 | 40 | 56 | 43 |

**Although preliminary, results from these experiments warrant further research. Ethephon was applied at all research sites according to commercial production methods for mechanical harvesting. Timing and rate of GA applications may be important in relation to ethephon applications. Studies in 2002 will attempt to answer these questions in research and commercial orchard scales.**