Chinese Academy of Agricultural Sciences:

Cherry Study (China) Increased Yield and Ripeness

Introduction

This study was headed by Dr. Tian Changping, in Yantai City, Shandong Province, China, using ACF-SR and ACF-SRP. Dr. Tian Changping, shown in the photo to the right (without the hat), is a scientist with ties to the Chinese Academy of Agricultural Sciences.

The project began with 10 year old cherry trees, in the early stages of fruit development. The specific species was Prunus cerasus (sour cherry), which is a species of Prunus in the subgenus Cerasus (cherries), native to much of Europe and southwest Asia. It is closely related to the sweet cherry (Prunus avium), but has a fruit that is more acidic, and has greater nutritional benefits.

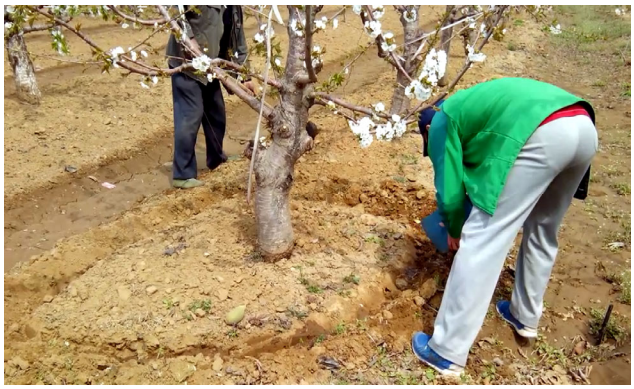
During the test program, two types of trees were dosed with the ACF-AgKit, and a matching number of both tree types were used as controls.

- 10 of the Red Lantern trees, were treated, and 10 Red Lantern trees were untreated (control).
- Similarly, 10 Early Van trees were treated, and 10 Early Van trees were untreated (control).

TLC FORMULAS Batch Prep Tank and Application Method

- The following procedure was used to prepare the products for dosing:
- One pound of ACF-SRP plus one Gallon of ACF-SR was added to a 55 gallon drum, filled with water, the water was brought to 27 C with an aquarium style heater, and this mixture was aerated for 72 hours.
- The final batch was to be used within 30 days for shelf life considerations

Specific Dosing Method



As shown in the photo, a trough was dug in a 1 meter radius around the tree. Next, for each dose to each tree, 3.3 liters of prepared ACF-AgKit was poured into the trough to optimize access to the root zone. Finally, 5 liters of water was added to the trough to help deliver the TLC liquid product into the root zone. The control trees received a matching quantity of water only.

Dates of actual product dosing are shown in Table 1 below:

Table1. TLC FORMULAS-liquid / (EcoBac) Diluent Dosage

Date of Dosing	Dosage	
	L/Tree	Water (Liters)
2021-04-11	3.3	5
2021-04-22	3.3	5
2021-05-05	3.3	5

Evaluation Methods

Five primary evaluations were conducted:

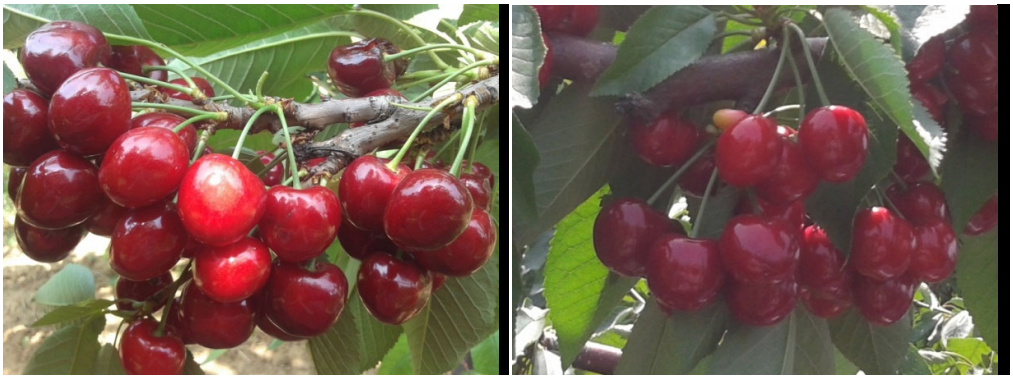
- Kg Cherries per Tree
- Average Mass of Single Cherry
- TSS%
- Titratable Acid%
- Ascorbic Acid (VS. mg / 100 grams)

To ensure valid sampling, 10 Kg of cherries were picked from each tree at random, and used for the various evaluation methods.

Discussion

It is important to note that this study was conducted over a very short time frame, with the first product dose occurring on April 11, subsequent doses in two week intervals with three total doses, and sampling and evaluation of fruit just 7 weeks after the initial TLC dose.

The photo below shows the Early Van treated cherries, compared to the Early Van control cherries:



a) Treatment – Early-Van b) Control – Early-Van

Kg Cherries per Tree

The treated Red Lantern trees had a total yield of 24.6 Kg per tree compared to the control value of 21.0 Kg per tree, with an improvement of 17% per tree
The treated Early Van trees had a total yield of 31.5 Kg per tree compared to the control value of 29.8 Kg per tree, with an improvement of 6% per tree

Single Cherry Weight

The average cherry weight in the treated Red Lantern trees was 10.43 grams compared to the control value of 9.89, with an improvement of 5% per cherry.
The average cherry weight in the treated Early Van trees 8.39 grams compared to the control value of 7.86, with an improvement of 7% per cherry.

Soluble Solids Content and Titratable Acidity

Soluble solids content (%) was determined by Milwaukee MR 200 hand digital refractometer (ATC, Rocky Mount, USA) at 20°C (°Brix). Titratable acidity (TA), as malic acid (%), was determined by titration to pH 8.1 with N/10 NaOH. On the basis of the measured data, soluble solids/titratable acidity ratio (Solid to acid ratio or ripening index—RI) was calculated.

The values for Soluble Solids Content (Brix) and Titratable Acidity, for treated and control, and for both types of trees, is presented in Table 2 (next page). In both types of trees, the Brix was greater for the treated cherries.

The accepted measure of ripeness (Ripeness Index) is the ratio of Soluble Solids Content / Titratable Acidity. For the Red Lantern trees, the test Ripeness Index (RI) was 52.1 compared to the control of 45.4, or 15% improved. For the Early Van trees, the treated RI was 44.7 compared to 32.8 RI for the control, or 36% improved.

Table 2: Cherry Tree Production and Comparision of Properties

Items	Production (Kg Cherries per Tree)	Production (Kg/Mu)	Weight (Single Cherry g)	Soluble Solids Content %	Titratable Acidity %	Ripeness Index	Vc mg / 100g
Red-Lantern （Control）	21.0	1155	9.89	19.34	0.426	45.4	6.26
Red-Lantern （Treated）	24.6	1353	10.43	19.78	0.380	52.1	6.69
Early-Van （Control）	29.8	1639	7.86	17.59	0.537	32.8	8.34
Early-Van （Treated）	31.5	1732.5	8.39	21.3	0.476	44.7	8.30

Note: 1 Mu (Chinese Acre) = 0.0667 hectares, or1 Acre = 6 Mu

Conclusions

The yield of cherries improved from 6% (Early Van) to 17% (Red Lantern) relative to the control trees. On average, for both types of trees, the average size of each cherry increased 5% to 7%.

Importantly, the Ripeness Index improved by 15% (Red Lantern trees) to 36% (Early Van trees).

This study proved the efficacy of the ACF-AgKit dosing to two species of cherry trees.