

# Apple Chemical Precision Thinning Research Update - New Jersey 2023-2024

Win Cowgill

*Professor Emeritus Rutgers University*

*Owner Win Enterprises International., LLC.*

Precision apple crop load management is the most important task fruit growers do each season, being critical for enhancing fruit size the current season and ensuring return bloom the following year.

In 2023 and 2024 we chemical thinned two orchard blocks using Plant Growth Regulators (PGR's) to obtain cropping consistency from year to year using the fruitlet growth rate model and other horticultural practices as follows:

- First, we determined the ideal crop load per tree to achieve target yield per acre.
- We use precision dormant pruning to adjust the fruit bud density to a predetermined number.

• We use the nibble approach to best utilize plant growth regulators (PGRs) to adjust crop load at bloom, petal fall and 10-15 MM, and again at 15-20 MM if needed.

• We use on site or local NEWA weather stations that utilizes the data via the Cornell Carbohydrate



**Photo 1.** 2024 Gala fruit cluster at petal fall flagged for measuring at Sun High Orchards Gala Thinning Experiment.

Photo Credit: Win Cowgill



**Photo 2.** 2024 Gala whole tree view with 14 clusters selected for measuring at Sun High Orchards Gala Thinning Experiment.

Photo Credit: Win Cowgill,

model to predict fruit set.

- We measure fruitlets in 14 clusters on each of 5 trees per variety periodically to determine efficacy of the PGR applications and the need for additional applications and rates (photos 1 and 2).

We have been honing this process for 15 years now. Our work using precision thinning with multiple cultivars over this time frame indicates the methodology of measuring fruit size/growth rate to determine chemical thinning treatments is highly reliable! The most important reason to measure fruit yourself is that you then



**Photo 3.** Overview of trees in 2024 Sun High Orchards Gala Thinning Experiment Overview. Photo Credit: Win Cowgill

know in real time what trees are doing and can make informed decisions.

For everything you need to know about Precision Apple Cropload Management see <https://pacman.extension.org>

### 2024 Precision Thinning Trial at Sun High Orchards, Randolph, NJ

#### Methods

Gala cv. Buckeye - 7th leaf tall spindle apples spaced 3' x 12' (photo 3).

Target apples per tree determined to be 80 fruit per tree. Nibble approach to chemical fruit thinning included:

- May 3 - Bloom – AMS 1 Lb./100 gal + NAA 4 ounces/A in 100 Gallons +Regulaid 16 oz/100 gal

**Table 1.** 2024 Sun High Predicted Fruit Set.

Date	Potential number apples set	Percent set*
May 7	1,117	
May 12	649	58
May 22	269	23
May 27	181	14
June 9	71	10

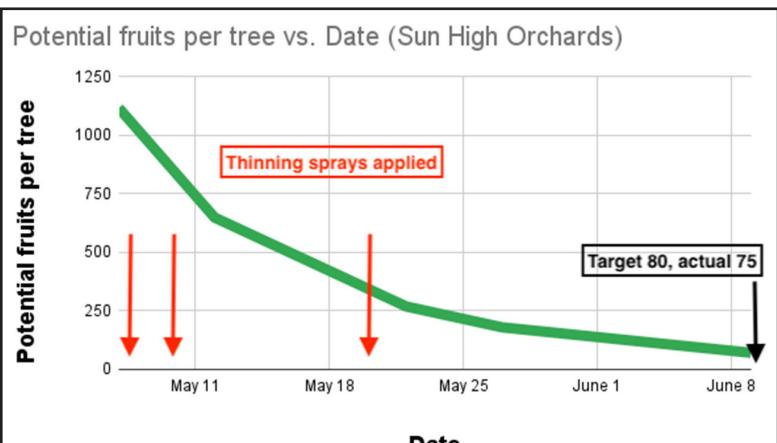
\*Target is typically 10%

@ 100 GPA TRV dilute

- May 7 - Petal Fall (4.3MM)–Benzyladenine (BA) as Exilis @ 75PPM /Acre in 100 + Sevin XLR @2 pint (32oz)/100 gal + Regulaid 16 oz/100 gal @ 100 GPA TRV dilute-
- May 22 - 10MM spray – Benzyladenine (BA) as Exilis @ 75PPM /Acre in 100 +Sevin XLR @2 pint (32oz)/100 gal @ 100 GPA TRV dilute

Used the NEWA Cornell Apple Carbohydrate Thinning model to determine 10MM rates.

Measured Fruit on May 7, May 12, May 22, May 27, and June 9. Fruitlet measurements entered in the Ferri Fruit Growth app predicting fruit set (Table 1).



**Figure 1.** 2024 Sun High Predicted Fruit Set.

### 2024 Conclusion Sun High Orchards Trial

Sun High Orchards Thinning Trial - 2024 worked as predicted with nibble approach and Cornell Carb Model. 71 fruit predicted to set on June 9, 75 actual fruit count per tree on June 12, 2024 so very close to target of 80 per tree (Figure 1).

### 2023 Precision Thinning Trial Wightman Farms - Morristown, NJ

#### Methods

Goldrush – 7th leaf tall spindle apples spaced 3' x 12'(Photo 4).



**Photo 4.** 2023- Goldrush whole tree view with 14 clusters selected for measuring at Wightman Farms Thinning Experiment. Photo Credit: Win Cowgill



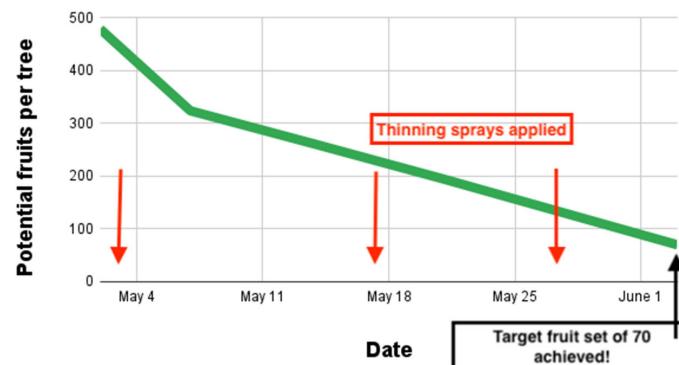
**Photo 5.** 2023- Goldrush fruit cluster at petal fall flagged for measuring at Wightman Farms Thinning Experiment. Photo Credit: Win Cowgill

Target apples per tree determined to be 80.

Nibble approach used NEWA Cornell Apple Carbohydrate Thinning model.

- April 21, bloom - 4 ounces NAA/acre in 80 gallons H2O @ 100 GPA TRV dilute
- May 1, petal fall - NAA @ 3 ounces/acre + 1.5 pints Sevin XLR in 80 GPA @100 GPA TRV dilute - (high carbohydrate surplus)
- May 17- 10 mm Maxcel @ 64 ounces + 1.5 pints Sevin XLR in 67 GPA @ 100 GPA TRV (high carbohydrate surplus, 150)
- May 27 – 18 mm - Accede SG @13.4 ounces (400PPM) +2 pints Sevin XLR @75 GPA + 8 ounces Regulaid @ 100 GPA TRV

Potential fruits per tree vs. Date (Wightman Farms)



**Figure 2.** 2023 Wightman Farm Predicted Fruit Set.

**Table 2.** 2023 Wightman Farms Predicted Fruit Set.

Date	Potential number apples set	Percent set*
May 2	479	
May 7	324	82
May 14	260	66
May 21	195	41
June 3	70	12

\*Target is typically 10%

Measured fruits on May 2, 7, 14, 21, and June 3. Fruitlet measurements entered in the Ferri Fruit Growth app predicting fruit set (Table 2, Photo 5).

### 2023 Discussion Wightman Farms

Every year in the chemical thinning world is different. It turned out to be a difficult thinning year for apples. Normally the nibble approach with three applications, Bloom, BF, 10MM gets the fruit off. This year in North Jersey and Wightman Farms the three Bloom, PF and 10 MM treatments did not take adequate fruit off our

Goldrush trial. In fact the rest of the orchard was way overset as well. We were still estimated to have 260 fruit per tree on the May 21st measurement with a target of 80 fruits per tree. Our newest PGR, Accede SG from Valent saved the day.

## 2023 Conclusion Wightman Farm Trial

Accede SG was applied at the high rate of 13.4 ounces (400PPM) +2 pints Sevin XLR @75 GPA + 8 ounces Regulaid @ 100 GPA TRV. It performed excellent; fruit load was estimated to be reduced to 70 fruits per tree in 2023. **Note:** In addition, return bloom was evaluated the following spring on May 7, 2024 and averaged 181 clusters per tree on the 5 treated trees from 2023, just about perfect, Figure 2.

Thank you to Adam Costello, Wightman Farms and Phil Green, Sun High Orchards for their support in conducting this important research on their farms.

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