



## **“Fruit Facts” – Wednesday, May 24<sup>th</sup>, 2023**

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### **2023 WNY Thinning Recommendations for Blocks That Were Damaged or Not by the Recent Frost**

This year we had excellent pollination weather and what appeared to be an excellent crop. Unfortunately, the unexpected frost of last Thursday May 18, resulted in significant damage on some farms. There is a whole range of damage levels with some farms showing no damage and others showing massive fruit damage. This variability in damage levels creates a very challenging situation for chemical thinning. In this article, we try to address all the possible scenarios and provide suggested thinning strategies (this is a summary of what was presented to the more than 120 WNY growers and industry reps who attended the CCE LOF thinning meetings hosted by Kast Farms in Orleans County on Monday May 21 and by the DeMarree Farm in Wayne County on Tuesday May 22).

Our assessment of the damage to the WNY apple crop: There are some blocks that are heavily damaged with few live fruitlets but most of the damaged blocks lost fruitlets mainly in the bottom of the tree while the fruitlets in the top are still alive. Thus, there is an urgent need to climb ladders and carefully check the tops of the trees. Where there are still many live fruitlets in the top of the tree, we can still salvage a pretty decent crop but it will take some skill when doing thinning.

There are differences in frost susceptibility among varieties. Empire for example has historically been damaged more than almost any other variety in New York state. Fuji and Red Delicious have also shown to be frost sensitive many times in our region in the past. In contrast, Honeycrisp and Gala seems to come through this kind of frost better in the past. In the case of NY-1 and NY-2, we are unsure how they are expected to fare because we haven't had them around long enough to evaluate their frost tolerance.

#### **Fruitlet evaluations for cold damage:**

For the remainder of this week, it is critical that growers and their employees go block by block, variety by variety, and try to make a quantitative assessment of the damage. We suggest growers evaluate 50 clusters/block (5 trees/block, 5 clusters/tree at the top and 5 clusters/tree at the bottom) and get a percentage of the cold damage fruitlets/block. Use ladders and check the tops! when evaluating cold-injured blocks this season.

To be able to evaluate the freeze injury damage, cut fruitlets horizontally across the equator of the fruitlet with a sharp knife or a razor (as shown in the below pictures taken last Friday May 19).



Photos: Elizabeth Tee (CCE LOF)

- If the fruitlet was not affected by the May 18 freeze, the tissues surrounding the seeds should still be healthy and of green color.
- If the king and/or lateral fruitlets have been damaged, there are three frost damage levels:
  1. If the core tissues show a slightly browning of the seeds, the fruitlets typically won't fall off but they also don't grow to be full size fruit. In the thinning process, we would like to thin off all these damaged fruitlets.
  2. If the core tissues are somewhat brown or dark brown, the fruitlets are dead and will likely fall off. We won't be able to see that drop for another week probably because it usually takes 10 days for that abscission zone to form.
  3. But in some severe cases, the whole center of the fruitlet is dark brown with some water-soaked tissue meaning that the cells have been disrupted and those will obviously fall off in the next few days.

We are not too worried about trying to remove the severely damaged fruit (level 3), but we would love to get rid of all of the partially damaged fruit (level 1) that give small fruit often with frost rings/mishappen fruit. You can certainly wait and try to get rid of the partially damaged fruit via hand thinning later, but growers do have an excellent option here in this next week or so to try to address this situation via thinning.

If through a systematic assessment of damage levels growers find that only 20-30% of the fruitlets are damaged then a full dose thinning spray will remove the damaged fruitlets and also thin of excess fruits. If the damage level is more severe where around 50% of the fruitlets are damaged then a reduced rate thinning program is prudent. However, if damage levels are in the 70-75% level then no thinning sprays is suggested.

Regardless of the thinning program chosen, we suggest growers wait to make their thinning decision until king fruits grow to 13mm and the lateral fruitlets are around 10-11mm.

#### **Expected optimum thinning window:**

To determine the best timing of the 10-13mm spray, we rely heavily in the carbohydrate model and we would like to encourage growers to look at it almost every day for the next week as we approach the traditional thinning window. When we analyzed the model results for the NEWA weather stations located at DeMarree in Williamson (lake site) and at the Apple Shed Farm in Fairville (inland site), it looks to us that the main thinning window starts on Saturday May 27 (will probably close on Monday May 29) for blocks located south of 104 and for blocks north of 104 it will start next week from Monday May 29 to Wednesday May 31, or possibly until Thursday June 1.

By yesterday (May 23), the carbohydrate model was forecasting for this coming Saturday and Sunday, a very high carbohydrate surplus which means very poor thinning conditions. So, we are predicting that thinning sprays that will go on Saturday (for inland sites) will be only mildly effective. However, since most orchards located south of 104 have varying levels of freeze damage, we recommend that growers wait and try to make a more informed thinning decision next Monday or Tuesday when kings will be around 13mm and laterals will be around 10-11mm. Hopefully by that time growers will have a better picture of the extent of the damage in their blocks and some damaged fruit will have dropped.

The temperatures for the rest of this week are predicted to be cool, but next week we are expecting warmer temperatures in the high 70's/low 80's for inland sites from Monday through Thursday, or until Friday. This will be perfect thinning weather, not above 85°F, but high 70's/low 80's that will be ideal if you have a full crop and no damage. For orchards closer to the lake, it looks like that next week from Monday through Wednesday will be in the lower 70's, but at least is not in the 60's. This will give us a pretty good potential window to thin next week. We will run the carbohydrate model this coming weekend and will update you about best thinning conditions via CCE LOF Fruit Facts early next week.

#### **Recommendations for Chemical Thinning at 10-13mm fruit size:**

##### Varieties where we like Maxcel + Sevin

Gala—64 oz Maxcel (100ppm BA) /100 gallons TRV dilute + 1pt Sevin/100 gal TRV dilute.

Empire— 48 oz Maxcel (75 ppm BA) /100 gallons TRV dilute + 1pt Sevin/100 gal TRV dilute.

Jonamac— 48 oz Maxcel (75 ppm BA) /100 gallons TRV dilute + 1pt Sevin/100 gal TRV dilute.

Macoun—48 oz Maxcel (75 ppm BA) /100 gallons TRV dilute + 1pt Sevin/100 gal TRV dilute.

Fuji—48-64 oz Maxcel (75-100 ppm BA) /100 gallons TRV dilute + 1pt Sevin/100 gal TRV dilute.

Red Delicious- 48 oz Maxcel (75 ppm BA) /100 gallons TRV dilute + 1pt Sevin/100 gal TRV dilute.

### Varieties where NAA works well

McIntosh—2oz Fruitone L or Pomaxa (5ppm NAA)/100 gal TRV dilute + 1pt Sevin/100 gal TRV dilute.

Honeycrisp—3oz Fruitone L or Pomaxa (7.5ppm NAA)/100 gal TRV dilute + + 1pt Sevin/100 gal TRV dilute.

Cortland— It doesn't like carbaryl and it thins very easy, so use 2oz Fruitone L or Pomaxa (5ppm NAA)/100 gal TRV.

Gingergold – 1oz Fruitone L or Pomaxa (2.5ppm NAA)/100 gal TRV dilute + 1pt Sevin/100 gal TRV dilute at 8-12 mm size.

NY1—48-64 oz Maxcel /100 gallons TRV dilute + 1pt Sevin/100 gal TRV dilute.

NY2- 3oz Fruitone L or Pomaxa/100 gal TRV dilute + 1pt Sevin/100 gal TRV dilute.

Golden Delicious - If you use Provide to control russetting at petal fall, then Golden thins easier and 10ppm of NAA (4oz Fruitone L or Pomaxa /100 gal TRV dilute) + 1pt Sevin/100 gal TRV dilute is ok, otherwise use 15ppm NAA (6oz Fruitone L or Pomaxa /100 gal TRV dilute) + 1pt Sevin/100 gal TRV.

Rome Beauty—5ppm NAA (2oz Fruitone L or Pomaxa /100 gal TRV dilute) + 1pt Sevin/100 gal TRV dilute (spur type use 7.5ppm NAA=2oz Fruitone L or Pomaxa /100 gal TRV dilute).

Northern Spy— it is a biennial, and it needs a bloom or petal fall spray followed by 3oz Fruitone L or Pomaxa (7.5ppm)/100 gal TRV dilute + 1pt Sevin/100 gal TRV dilute.

Idared- 2.5ppm NAA (1oz Fruitone L or Pomaxa /100 gal TRV dilute) + 1pt Sevin/100 gal TRV dilute.

Jonagold- 7.5ppm NAA (3oz Fruitone L or Pomaxa /100 gal TRV dilute + 1pt Sevin/100 gal TRV dilute)

Pink Lady- 2.5 to 5ppm NAA (1oz to 2oz Fruitone L or Pomaxa /100 gal TRV dilute) + 1pt Sevin/100 gal TRV dilute.

### Chemical thinning program for Young Trees:

- For newly planted trees where you desire to totally eliminate the crop use a high rate of Maxcel (64 ounces) + Sevin (2pts) + Oil (1pt) /100 gallon TRV dilute when fruit size is 8-10mm
- For 2<sup>nd</sup> year trees use only hand thinning and the Cornell young tree thinning guide to adjust crop load.
- For 3<sup>rd</sup> year trees use Sevin alone + follow-up hand-thinning.
- For 4<sup>th</sup> year trees use 1/2 of our suggested full rate of NAA + Sevin or Maxcel + Sevin.

### Spray Mixing Instructions Considering Tree Row Volume:

Plant Growth Regulator response is a function of the amount of chemical deposited on the leaves of the tree. The amount of chemical that is sprayed per acre should consider tree size to not over-apply chemical to small trees and under-apply chemical to large trees.

Tree size can be used to adjust the amount of chemical added to the spray tank by calculating the size of the tree canopy (tree row volume). The tree row volume of an orchard is defined as the volume of water to spray the trees to drip, which is termed a full dilute spray.

The amount of chemical can then be adjusted to the size of the trees with fully-grown trees receiving a full amount (100% dose) and smaller trees receiving an appropriate fraction of a full dose.

The volume of water used to carry the chemical to the leaves can be less than the full dilute volume but if less than the full dilute volume is used then the amount of chemical in the tank must be concentrated to allow the proper amount of chemical to be applied to each tree.

The concentration factor is determined by dividing the full dilute volume of water (TRV) by the actual amount of water to be sprayed.

The first step in the spraying process is to mix the tank properly. This process be broken down into 3 easy steps:

#### 1. Calculate Tree Row Volume (Tree height X Tree width X 43,560 X 0.7) / (Between row spacing X 1000)

- Example of a Tall Spindle Orchard

For many mature Tall Spindle Orchards this is ~200 gallons/acre

Example (11' X 7' X 43560 X 0.7) / (12' X 1000) = 196 gallons/acre (rounded to 200GPA)

#### 2. Determine the amount of water to be sprayed per acre

- For the example of the Tall Spindle trees let's assume you set up the sprayer to spray ½ of Tree Row Volume which would be 100 gallons/acre. Thus, this is a 2X application on TRV trees of 200GPA (200/100=2).

#### 3. Concentrate the chemicals in the tank

- Multiply the recommended rate for 100 gallons dilute TRV basis X 2 for each chemical (except oil or surfactants)

Note: Old semi dwarf trees may be 300GPA+ however, these older bigger trees with more vigorous rootstocks, thin easier, so set your maximum TRV at 200 GPA max, never 300. However younger trees in tall spindle blocks may only be 150, 125 or 100 GPA TRV on younger trees.

Next Step is Adjusting the Spray Pattern:

Often the bottoms of trees show over-thinning while the tops of trees show under-thinning. Our standard recommendation is to nozzle the sprayer so that 2/3 of the spray volume is directed to the top half of the tree and only 1/3 is directed to the bottom half of the tree. Recent studies have shown a more uniform distribution of fruits on the tree is achieved when 80% of the spray is directed to the top of the tree and only 20% is directed to the bottom of the tree.

Please note that when you shut off the bottom half of the nozzles you need to adjust up your rate of chemical per acre you add to the tank since the volume of water applied per acre is less.

**Final Thoughts:**

The frost damage this year complicates the thinning program for many orchardists. However, with proper assessment of the damage and waiting until next week to spray will allow a more informed decision to be made. In almost all cases there is still substantial fruit in the tops of the trees that need thinning. Thus, don't lose the opportunity early next week. For those growers who did not experience any frost damage, there is a large crop that needs an aggressive thinning program.

Every effort has been made to provide correct, complete, and up-to-date pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly, and human errors are still possible. These recommendations are not a substitute for pesticide labeling. Please read the label before applying any pesticide. Copyright 2023. All rights reserved. No part of this material may be reproduced or redistributed by any means without permission. Cornell Cooperative Extension provides equal program and employment opportunities.

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