Northern NY Agricultural Development Program
2025 Project Report

Evaluating the New Apple Thinning Material "Accede" Under Northern New York Thinning Conditions

Project Leader
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- Chazy Orchards, Chazy, NY
- Forrence Orchards, Peru, NY
- Gunnison Lakeshore Orchards, Crown Point, NY

Background
Apple crop load management is the single most important management practice affecting an orchard's crop value. Growers must balance between reducing crop load (yield) sufficiently to achieve optimum fruit size and return bloom in the following year. For each variety, there is an optimum number of fruit per tree where yield, fruit size, and fruit quality are balanced to bring the greatest economic return to the grower.

In Northern NY, most crop load management is performed by thinning trees when fruit are between 10-12 mm in size following the petal fall period. Thinning at this timing relies primarily on the use of hormone-based plant growth regulator materials and carbaryl, an insecticide that also acts as a mild fruit thinner. Once fruit grow larger than 15 mm, their response to these chemical thinners becomes greatly reduced. Thinning at the 12 mm timing is particularly challenging in Northern New York, as temperature heavily drives hormone thinners' level of activity. Thinners tend to work poorly under cool, sunny conditions, which are common conditions in northern New York.

Where orchards require more thinning after the 12 mm application, there have generally been only two options available. The first was to apply 6-BA and carbaryl along with oil. The oil helps the plants take up more of the thinning materials. However, many northern New York growers do not like to use this approach, as oil applications interfere with their fungicide materials that they are also using at this time of year. The other option has been Ethephon, which is an ethylene-based thinning material. Few Northern New York growers use this product for thinning, because it is also extremely temperature sensitive. If the weather is too warm at the time of application, growers are at great risk of removing too much fruit from their trees.

Once fruit grow larger than 24 mm, fruit become unresponsive to chemical thinners. Where additional thinning is still necessary, growers will send crews through to hand-thin the crop. However, hand-thinning fruit takes a great deal of labor time, and high labor costs in NY make it prohibitively expensive for some growers to send crews through to do much hand thinning.

Recently, Valent Biosciences released a new thinning material called Accede®. Accede's active ingredient is 1-Aminocyclopropane 1-Carboxylic Acid (ACC), which is the direct precursor of the plant hormone ethylene. It has a similar mode of action as Ethephon, but its efficacy is reported to be less sensitive to temperature swings, which should make it a more reliable material to use during the 15-20 mm "rescue thinning" window.

Having a feasible rescue thinning material would be particularly valuable in Northern New York apple production, as growers across the region had poor thinning results with some hormone-based thinners in 2018, 2019, 2020, and 2022. This caused small fruit size in some varieties like Gala, and led to poor return bloom in 2019 and 2021 on their Honeycrisp trees, one of Northern New York's most valuable apple varieties.

Accede has been field-tested in other regions but only on a small trial basis, and, until this Northern New York Agricultural Development Program (NNYADP)-funded trial, had not yet been evaluated under Northern New York growing conditions. As previously mentioned, Northern New York often has cooler temperatures during the thinning windows relative to other regions of New York, making it therefore critical to evaluate this material in NNY orchards, even on a small-scale basis, before we recommend its use to growers at a commercial scale.

We began testing this material in 2023 and 2024 in Northern New York in two previous NNYADP projects. However, two years of data were not enough to fully understand how Accede responds to the various weather conditions we can experience during the thinning windows. In addition, many of the blocks we worked in were impacted by the May 2023 spring freeze event, and a milder cold event in April 2024. These events made us believe the trees in our experiments were likely more susceptible to the effects of Accede, and required an additional year of testing to better understand the amount of thinning we should expect from Accede when freeze damage is not a concern.

Having an effective late season "rescue" thinning material will bolster the profitability of Northern NY apple growers by allowing fruit growers to achieve optimum crop loads to maximize their fruit yield and quality, while reducing the amount of labor needed to hand thin the crop.

Methods

We established four replicated field trials in commercial orchards in Northern New York: (1) a Gala trial, (2) a Honeycrisp trial, and (3) a NY-1 trial at Chazy Orchards, Chazy, New York; and (4) a Macoun trial at Forrence Orchards, Peru, New York. We also ran an unreplicated Gala demonstration trial at Gunnison's Lakeshore Orchard, Crown Point, New York. These varieties are widely planted across Northern New York and are difficult to thin. Honeycrisp is also the most valuable variety grown in Northern New York.

Due to long names of certain products, we have chosen to use commonly accepted abbreviations for certain products and concepts throughout the following sections of this document. We have included the following key:

List of Abbreviations		
Abbreviation	**Full Name**	**Description**
NAA	1-naphthaleneacetic acid	An auxin-based plant growth regulator product formulated for thinning from 3 to 10 mm.
6-BA	6-benzyladenine	A cytokinin-based plant growth regulator product formulated for thinning from 5 to 15 mm.
ATS	ammonium thiosulfate	A common nitrogen fertilizer used for bloom thinning apples.
carbaryl	1-naphthyl methylcarbamate	A carbamate insecticide that also caused fruit thinning. Labeled for thinning from petal fall through 16 mm.
TRV	tree row volume	An estimation of the three dimensional volume of trees within the orchard, used to estimate water volumes needed to apply thinning products.

For these trials Accede was compared with use of a hormone-based plant growth inhibitor – 6-BA (MaxCel®) or NAA (PoMaxa®) – in tandem with carbaryl (Carbaryl 4L). **Note:** The use of brand names or any mention/listing of specific commercial products or services herein is solely for educational purposes and does not imply endorsement by the Northern New York Agricultural Development or project collaborators, nor discrimination against similar brands, products, or services not mentioned.

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Chazy Orchards: Gala Trial

Our Gala trial at Chazy Orchards consisted of a block of Buckeye Gala on M.9-337, initially planted in 2013 at 3x14-foot spacing. Working with the grower, we determined the target crop load for the block was 150 fruit per tree. We selected five trees in April 2025 (five replications of single trees in a randomized complete block design) within the orchard to receive one of four thinning treatments beginning at petal fall (Table 1).

Prior to thinning, the number of fruit clusters was counted on each study tree.

On May 28, 2025, Treatments 1, 2, and 4 received a petal fall application of 6-BA at the rate of 128 fl oz per 100 gallons per acre (GPA) and 1 pt of carbaryl per 100 gallons.

On June 8, Treatments 1, 3, and 4 received a 12 mm application of 6-BA at the rate of 128 fl oz per 100 gallons and 1 pt of carbaryl per 100 gallons.

On June 16, Treatments 2, 3, and 4 received a 20 mm application of Accede at the rate of 13.4 oz Accede per 100 gallons and 6-BA at the rate of 64 fl oz per 100 gallons.

Treatment	Petal Fall Whole Tree	10-12 mm 75% top of tree	20 mm 80% to upper 2/3 of tree
1	100 ppm 6-BA + 1 pt carbaryl / 100	100 ppm 6-BA + 1 pt carbaryl / 100	
2	100 ppm 6-BA + 1 pt carbaryl / 100		400 ppm Accede + 100 ppm 6-BA
3		100 ppm 6-BA + 1 pt carbaryl / 100	400 ppm Accede + 100 ppm 6-BA
4	100 ppm 6-BA + 1 pt carbaryl / 100	100 ppm 6-BA + 1 pt carbaryl / 100	400 ppm Accede + 100 ppm 6-BA

Table 1. Thinning treatments, Gala trial, Chazy Orchards, Chazy NY; NNYADP Evaluating the New Apple Thinning Material "Accede" Under Northern New York Thinning Conditions, 2025.

The petal fall and 12 mm thinner applications were applied with the grower's over-the-row sprayer, calibrated to deliver 50 GPA. We estimated TRV at 100 GPA, using a concentration factor of 2.0. The 20 mm application was applied with the grower's airblast sprayer, calibrated to apply at 100 GPA. This application was not concentrated.

Fruit were harvested according to red color development on September 19 and October 1, 2025. As fruit were harvested, we recorded the total fruit count and fruit weight per tree. From these measurements, average fruit size per tree was also tabulated. Drops were counted under each tree after the final harvest date. Fruit set was calculated as the percentage of fruit plus drops harvested from each tree relative to the number of flower clusters we counted from that tree earlier in the spring. A subsample of 30 fruit per treatment was shipped to Dr. Terence Robinson at Cornell AgriTech and sorted over a color and size grader. These data were used to tabulate % red color and crop value of each treatment.

Return bloom data will be assessed in May of 2026.

Chazy Orchards: Honeycrisp Trial

Our Honeycrisp trial consisted of a block of Honeycrisp on Bud 9 rootstock, initially planted in 2013 at 3x14-foot spacing. Working with the grower, we determined the target crop load for the block was 120 fruit per tree. We selected five trees in April 2025 (five replications of single trees in a randomized complete block design) within the orchard to receive one of four thinning treatments beginning at petal fall (Table 2).

Prior to thinning, the number of fruit clusters was counted on each study tree.

On May 28, 2025, Treatments 1, 2, and 4 received a petal fall application of an NAA product at the rate of 6 oz per 100 gallons and carbaryl at the rate of 1 pt per 100 gallons.

On June 6, Treatments 1, 3, and 4 received a 12 mm application of NAA at the rate of 6 oz per 100 gallons and carbaryl at the rate of 1 pt per 100 gallons.

On June 11, Treatments 2, 3, and 4 received a 20 mm application of Accede at the rate of 13.4 oz Accede per 100 gallons and carbaryl at the rate of 1 pt per 100 gallons.

Treatment	Petal Fall Whole Tree	10-12 mm 75% top of tree	20 mm 80% to upper 2/3 of tree
1	7.5 ppm NAA + 1pt carbaryl / 100	7.5 ppm NAA + 1pt carbaryl / 100	
2	7.5 ppm NAA + 1pt carbaryl / 100		400 ppm Accede + 1 pt carbaryl / 100
3		7.5 ppm NAA + 1pt carbaryl / 100	400 ppm Accede + 1 pt carbaryl / 100
4	7.5 ppm NAA + 1pt carbaryl / 100	7.5 ppm NAA + 1pt carbaryl / 100	400 ppm Accede + 1 pt carbaryl / 100

Table 2. Thinning treatments, Honeycrisp trial, Chazy Orchards, Chazy NY; NNYADP Evaluating the New Apple Thinning Material "Accede" Under Northern New York Thinning Conditions, 2025.

The petal fall and 12 mm thinner applications were applied with the grower's over-the-row sprayer, calibrated to deliver 50 GPA. We estimated TRV at 100 GPA, using a concentration factor of 2.0. The 20 mm application was applied with the grower's airblast sprayer, calibrated to apply at 100 GPA. This application was not concentrated.

Fruit were harvested according to red color development on the following dates: September 17, October 3, and October 14. As fruit were harvested, we recorded the total fruit count and fruit weight per tree. From these measurements, average fruit size per tree was also tabulated. Drops were counted under each tree after the final harvest date. Fruit set was calculated as the percentage of fruit plus drops harvested from each tree relative to the number of flower clusters we counted from that tree earlier in the spring. A subsample of 30 fruit per treatment was shipped to Cornell AgriTech and sorted over a color and size grader. These data were used to tabulate % red color and crop value of each treatment.

Return bloom data will be assessed in May of 2026.

Chazy Orchards: NY-1 Trial

Our NY-1 experiment consisted of a block of NY-1 on M.26 rootstock, initially planted in 2013 at 3x14-foot spacing. Working with the grower, we determined the target crop load for the block was 120 fruit per tree. We selected five trees in April 2025 (five replications of single trees in a randomized complete block design) within the orchard to receive one of four thinning treatments beginning at petal fall (Table 3).

Prior to thinning, the number of fruit clusters was counted on each study tree.

On May 28, 2025, Treatments 1, 2, and 4 received a petal fall application of 6-BA at the rate of 128 fl oz per 100 gallons and 1 pt of carbaryl per 100 gallons.

Treatment	Petal Fall Whole Tree	10-12 mm 75% top of tree	20 mm 80% to upper 2/3 of tree
1	100 ppm 6-BA + 1 pt carbaryl / 100	100 ppm 6-BA + 1 pt carbaryl / 100	
2	100 ppm 6-BA + 1 pt carbaryl / 100		400 ppm Accede + 100 ppm 6-BA
3		100 ppm 6-BA + 1 pt carbaryl / 100	400 ppm Accede + 100 ppm 6-BA
4	100 ppm 6-BA + 1 pt carbaryl / 100	100 ppm 6-BA + 1 pt carbaryl / 100	400 ppm Accede + 100 ppm 6-BA

Table 3. Thinning treatments, NY-1 trial, Chazy Orchards, Chazy NY; NNYADP Evaluating the New Apple Thinning Material "Accede" Under Northern New York Thinning Conditions, 2025.

On June 8, Treatments 1, 3, and 4 received a 12 mm application of 6-BA at the rate of 128 fl oz per 100 gallons and 1 pt of carbaryl per 100 gallons.

On June 16, Treatments 2, 3, and 4 received a 20 mm application of Accede at the rate of 13.4 oz Accede and 6-BA at the rate of 64 fl oz per 100 gallons dilute TRV.

The petal fall and 12 mm thinner applications were applied with the grower's over-the-row sprayer, calibrated to deliver 50 GPA. We estimated TRV at 100 GPA, using a concentration factor of 2.0. The 20 mm application was applied with the grower's airblast sprayer, calibrated to apply at 100 GPA. This application was not concentrated. Unfortunately, a thinning crew accidentally hand-thinned the experimental trees in early July, so we were unable to collect data from this trial. Results are not shown.

Forrence Orchards: Macoun Trial

Our Macoun trial consisted of a block of Macoun on M.26 rootstock, initially planted in 2005 at 6x14-foot spacing. Working with the grower, we determined the target crop load for the block was 150 fruit per tree. We selected five trees in April 2025 (five replications of single trees in a randomized complete block design) within the orchard to receive one of four thinning treatments at bloom (Table 4).

Treatment	Bloom Whole Tree	Petal Fall Whole Tree	10-12 mm 75% top of tree	20 mm 80% to upper 2/3 of tree
1	2 x 2.5% ATS			
2	2 x 2.5% ATS	7.5 ppm NAA + 2 pt carbaryl		400 ppm Accede + 100 ppm 6-BA
3	2 x 2.5% ATS		100 ppm 6-BA + 1 pt carbaryl/ 100	400 ppm Accede + 100 ppm 6-BA
4	2 x 2.5% ATS			400 ppm Accede + 100 ppm 6-BA

Table 4. Thinning treatments, Macoun trial, Forrence Orchards, Peru NY; NNYADP Evaluating the New Apple Thinning Material "Accede" Under Northern New York Thinning Conditions, 2025.

Prior to thinning, the number of fruit clusters was counted on each study tree.

On May 15, 2025, all treatments received a bloom application of ATS at the rate of 2.5 gallons per 100 gallons of water. A second application was applied on May 16.

On May 26, Treatment 2 received a petal fall application of 6 fl oz NAA per 100 gallons and 2 pts carbaryl per 100 gallons.

On June 3, Treatment 3 received a 12 mm application of 128 oz 6-BA per 100 gallons and carbaryl at the rate of 1 pt per 100 gallons.

On June 8, Treatments 2, 3, and 4 received a 20 mm application of Accede at the rate of 16 oz Accede and 128 oz 6-BA per 100 gallons.

All thinner applications were applied with the grower's airblast sprayer, calibrated to deliver 83 GPA. We estimated tree TRV at 166 GPA, using a concentration factor of 2.0 for the petal fall and 12 mm applications. For the 20 mm application, we fully concentrated the 6-BA by TRV, but only concentrated the rate up to the assumed 100 GPA water volume rate for the Accede.

Fruit were harvested on September 30. As fruit were harvested, we recorded the total fruit count and fruit weight per tree. From these measurements, average fruit size per tree was also tabulated. Drops were counted under each tree after the final harvest date. Fruit set was calculated as the percentage of fruit plus drops harvested from each tree relative to the number of flower clusters we counted from that tree earlier in the spring. A subsample of 30 fruit per treatment was shipped to Cornell AgriTech and sorted over a color and size grader. These resulting data were used to tabulate % red color and crop value of each treatment.

Return bloom data will be assessed in May of 2026.

Gunnison Orchards: Gala Trial

In April 2025 a demonstration trial was set up on a mature block of Gala at Gunnison Lakeshore Orchard. This block was planted on M.9 rootstock. This Gala block was topworked in 2018 and is planted at 6 x 12 foot spacing. Working with the grower, we determined the ideal crop load for the block was 120 fruit per tree. We selected 10 trees in April 2025 (one replication of five trees) within the orchard to receive one of two thinning treatments (Table 5).

Treatment	10-12 mm 75% top of tree	20 mm 80% to upper 2/3 of tree
1	100 ppm 6-BA + 1 pt carbaryl/ 100	
2	100 ppm 6-BA + 1 pt carbaryl/ 100	400 ppm Accede

Table 5. Thinning treatments, Gala trial, Gunnison Lakeshore Orchards, Crown Point NY; NNYADP Evaluating the New Apple Thinning Material "Accede" Under Northern New York Thinning Conditions, 2025.

On May 29, 2025, Treatments 1 and 2 received a 12mm application of 6-BA at the rate of 128 oz per 100 gallons and 1 pt carbaryl per 100 gallons. This application was applied with the grower's airblast sprayer, calibrated to deliver 75 GPA. We estimated TRV at 150 GPA, using a concentration factor of 2 for the 6-BA.

On June 11, Treatment 2 received a 20 mm application of Accede at the rate of 13.4 oz Accede. This application was applied at 75 gallons of water to the acre.

Fruit were harvested according to red color development on September 12 and October 2, 2025. As fruit were harvested, we recorded the total fruit count and fruit weight per tree. From these measurements, average fruit size per tree was also tabulated. Fruit drop was counted after the final harvest. A subsample of 20 fruit per treatment was shipped to Cornell AgriTech and sorted over a color and size grader. These data were used to tabulate % red color and crop value of each treatment.

Return bloom data will be assessed in May of 2026.

Statistical Analysis

Treatment differences in number of fruit per tree, yield per tree (kg), fruit size (kg), fruit plus drops, % fruit set, % red color, and crop value ($ per acre) were analyzed in SAS statistical software using the Generalized Linear Model (GLM) procedure. Where the model determined significant treatment differences, differences between individual treatments were assessed using Duncan's Multiple Range Test in SAS statistical software.

Means are reported for the Gunnison's Gala trial. Statistics are not reported, as this trial was not replicated.

Results

Chazy Orchards: Gala

We observed significant differences in total fruit per tree at harvest between treatments (p=0.0138). While our target crop load for this block was 150 fruit per tree:

- Treatment 1 averaged 214 fruit per tree
- Treatment 2 averaged 185 fruit per tree
- Treatment 3 averaged 158 fruit per tree
- Treatment 4 averaged 166 fruit per tree.

Yield per tree did not differ significantly between treatments (p=0.2966). Yield per tree averaged:

- 26.52 kg in Treatment 1
- 26.16 kg in Treatment 2
- 21.84 kg in Treatment 3
- 22.96 kg in Treatment 4.

Average fruit size did not differ significantly between treatments (p=0.2308). Fruit size averaged:

- 0.13 kg in Treatment 1
- 0.14 kg in Treatment 2
- 0.14 kg in Treatment 3
- 0.14 kg in Treatment 4.

The total number of fruit plus drops significantly differed (p=0.0108) between treatments, and averaged:

- 219 fruit per tree in Treatment 1
- 194 fruit per tree Treatment 2
- 162 fruit per tree Treatment 3
- 172 fruit per tree in Treatment 4.

Percent fruit set significantly differed (p=0.0156) between treatments, and averaged:

- 34% fruit set in Treatment 1
- 34% fruit set in Treatment 2
- 26% fruit set in Treatment 3
- 27% fruit set in Treatment 4.

Fruit % red color did not significantly differ between treatments (p=0.5397). Percent red color averaged:

- 88% in Treatment 1
- 81% in Treatment 2
- 89% in treatment 3
- 86% in Treatment 4.

Crop value did not significantly differ between treatments (p=0.4439). Crop value in dollars per acre by treatment averaged:

- $9,460 in Treatment 1
- $16,039 in Treatment 2
- $11,702 in Treatment 3
- $12,259 in Treatment 4.

Chazy Gala Thinning 2025								
Treatment	Applications	Total Fruit	Yield (kg)	Fruit Size (kg)	Fruit + Drops	% Fruit Set	% Red Color	Crop Value Per Acre ($)
1	PF, 12 mm	214 A	26.52	0.13	219 A	34 A	85	9460
2	PF, 20 mm	185 AB	26.16	0.14	194 AB	34 A	77	16039
3	12 mm, 20 mm	158 B	21.84	0.14	162 B	26 B	86	11702
4	PF, 12 mm, 20 mm	166 B	22.96	0.14	172 B	27 B	83	12259
P Value		**0.0138**	**0.2966**	**0.2308**	**0.0108**	**0.0156**	**0.5397**	**0.4439**

Table 6. Harvest data from the Chazy Orchards Gala trial. Differing letters show statistically significant differences between treatments at p value < 0.05; Evaluating the New Apple Thinning Material "Accede" Under Northern New York Thinning Conditions, 2025.

Chazy Orchards: Honeycrisp

We did not observe any significant differences in total fruit per tree at harvest (p=0.0601). While our target crop load for this block was 120 fruit per tree:

- Treatment 1 averaged 155 fruit per tree
- Treatment 2 averaged 143 fruit per tree
- Treatment 3 averaged 117 fruit per tree
- Treatment 4 averaged 132 fruit per tree.

Yield per tree did not significantly different in our trial (p=0.3152). Yield per tree averaged:

- 28.82 kg in Treatment 1
- 24.10 kg in Treatment 2
- 22.89 kg in Treatment 3
- 21.92 kg in Treatment 4.

Average fruit size did not significantly different in our trial (p=0.4225). Fruit size per tree averaged:

- 0.19 kg in Treatment 1
- 0.17 kg in Treatment 2
- 0.20 kg in Treatment 3
- 0.17 kg in Treatment 4.

The total number of fruit plus drops significantly differed (p=0.0166), and averaged:

- 181 fruit per tree in Treatment 1
- 155 fruit per tree Treatment 2
- 130 fruit per tree Treatment 3
- 145 fruit per in Treatment 4.

Chazy Honeycrisp Thinning 2025								
Treatment	Applications	Total Fruit	Yield (kg)	Fruit Size (kg)	Fruit + Drops	% Fruit Set	% Red Color	Crop Value Per Acre ($)
1	PF, 12 mm	155	28.82	0.19	181 A	16	32	22948
2	PF, 20 mm	143	24.10	0.17	155 AB	15	31	16853
3	12 mm, 20 mm	117	22.89	0.20	130 B	13	38	21228
4	PF, 12 mm, 20 mm	132	21.92	0.17	145 AB	14	33	15614
P Value		0.0601	0.3152	0.4225	**0.0166**	0.1588	0.5622	0.6127

Table 7. Harvest and crop value data from the Chazy Orchards Honeycrisp trial. Differing letters show statistically significant differences between treatments at p value < 0.05; Evaluating the New Apple Thinning Material "Accede" Under Northern New York Thinning Conditions, 2025.

Percent fruit set of each treatment did not significantly differ (p=0.1588), and averaged:

- 16% fruit set in Treatment 1
- 15% fruit set in Treatment 2
- 13% fruit set in Treatment 3
- 14% fruit set in Treatment 4.

Fruit % red color did not differ between treatments (p=0.5622). Percent red color averaged:

- 39% in Treatment 1
- 36% in Treatment 2
- 43% in treatment 3
- 39% in Treatment 4.

Crop value did not significantly differ between treatments (p=0.6127). Crop value in dollars per acre by treatment averaged:

- $22,948 in Treatment 1
- $16,853 in Treatment 2
- $21,228 in Treatment 3
- $15,614 in Treatment 4.

Chazy Orchards: NY-1

Due to hand thinning on experimental trees in early July, we were unable to collect harvest data.

Forrence Orchards: Macoun

We observed no significant differences in total fruit per tree at harvest (p=0.2985). While our target crop load for this block was 150 fruit per tree:

- Treatment 1 averaged 224 fruit per tree
- Treatment 2 averaged 207 fruit per tree
- Treatment 3 averaged 180 fruit per tree
- Treatment 4 averaged 228 fruit per tree.

Yield per tree was not significantly different in our trial (p=0.7348). Yield per tree averaged:

- 32.95 kg in Treatment 1
- 35.10 kg in Treatment 2
- 30.74 kg in Treatment 3
- 32.28 kg in Treatment 4.

Average fruit size significantly differed in our trial (p=0.0270). Fruit size per tree averaged:

- 0.15 kg in Treatment 1
- 0.17 kg in Treatment 2
- 0.17 kg in Treatment 3
- 0.14 kg in Treatment 4.

The total number of fruit plus drops significantly differed (p=0.0172), and averaged:

- 309 fruit per tree in Treatment 1
- 253 fruit per tree Treatment 2
- 222 fruit per tree Treatment 3
- 319 fruit per in Treatment 4.

Fruit set of each treatment did not significantly differ (p=0.0559), and averaged:

- 18% fruit set in Treatment 1
- 15% fruit set in Treatment 2
- 13% fruit set in Treatment 3
- 18% fruit set in Treatment 4.

Fruit % red color did not differ significantly between treatments (p=0.2310). Fruit percent red color averaged:

- 42% in Treatment 1
- 55% in Treatment 2
- 42% in Treatment 3
- 45% in Treatment 4.

Crop value did not significantly differ between treatments (p=0.0795). Crop value in dollars per acre by treatment averaged:

- $7,088 in Treatment 1
- $12,244 in Treatment 2
- $9,138 in Treatment 3
- $6,611 in Treatment 4.

Forrence Macoun Thinning 2025								
Treatment	**Applications**	**Total Fruit**	**Yield (kg)**	**Fruit Size (kg)**	**Fruit + Drops**	**% Fruit Set**	**% Red Color**	**Crop Value Per Acre ($)**
1	Bloom	224	32.95	0.15 AB	309 AB	18	42	7088
2	Bloom, PF, 20 mm	207	35.10	0.17 AB	253 AB	15	55	12244
3	Bloom,12mm, 20 mm	180	30.74	0.17 A	222 B	13	42	9138
4	Bloom, 20 mm	228	32.28	0.14 B	319 A	18	45	6611
P Value		0.2985	0.7348	**0.027**	**0.0172**	0.0559	0.2310	0.0795

Table 8. Harvest and crop value data from the Forrence Orchards Macoun trial. Differing letters show statistically significant differences between treatments at p value < 0.05; Evaluating the New Apple Thinning Material "Accede" Under Northern New York Thinning Conditions, 2025.

Gunnison Orchards: Gala
Means of the number of fruit per tree, yield per tree, fruit size, red color, and crop value per acre are reported below.

Gunnison Gala Thinning 2025							
Treatment	**Applications**	**# Fruit**	**Yield (kg)**	**Fruit Size (kg)**	**Fruit + Drops**	**% Red Color**	**Crop Value Per Acre ($)**
Control	12mm	97	12.81	0.13	99	84	3062
Accede	12mm, 20mm	113	13.47	0.12	118	88	1900

Table 9. Harvest and crop value data from the Gunnison Orchards Gala trial. Evaluating the New Apple Thinning Material "Accede" Under Northern New York Thinning Conditions, 2025.

2024 Trial Return Bloom
We observed differences in return bloom by treatment in the spring of 2025 in our 2024 Gala trial (p-value = 0.0043). Data is reported in Table 10. Treatment 4, which was the grower's standard program with the addition of Accede at 20 mm, had more return bloom than treatments 1 (bloom, PF, 12 mm) and 2 (bloom, PF, and 20 mm). We saw no return bloom differences in our 2024 Forrence Honeycrisp (p-value = 0.2629), Forrence NY-1 (p-value = 0.1031), or Chazy NY-1 (p-value = 0.550) trials. Return bloom was 33% in the grower's standard and 47% in the grower's standard plus Accede treatment in our Gunnison's Gala demo trial. Since this was not a replicated trial, we cannot assess if this is significant or not. From the grower's standpoint though, these are very low levels of return bloom for this Gala block.

Gala Thinning 2024 Return Bloom		
Treatment	**Applications**	**% Return Bloom**
1	Bloom, PF, 12 mm	23 B
2	Bloom, PF, 20 mm	36 B
3	Bloom, 12 mm, 20 mm	47 AB
4	Bloom, PF, 12 mm, 20 mm	61 A
P-Value		**0.0043**

Table 10. 2024 Gala trial return bloom by treatment. Evaluating the New Apple Thinning Material "Accede" Under Northern New York Thinning Conditions, 2025.

Discussion
In our Chazy Gala trial, treatments 3 and 4 had improved thinning compared to the grower's standard program in treatment 1, in terms of total fruit at harvest, fruit plus drops at harvest, and % fruit set. This suggests the application of Accede at 20 mm may be helpful in Gala to remove additional fruit from the trees where inadequate levels of thinning were achieved by the standard thinning timings of petal fall and 12 mm. Unfortunately, this additional thinning did not coincide with a significant increase in fruit size or % red color, and, therefore, did not lead to a significant increase in crop value.

These findings are in general agreement with our 2023 Gala study, which found that 20mm applications of Accede appear to give similar levels of thinning as applications of traditional thinner combinations at

petal fall and 12 mm. We believe the addition of 6-BA to our Accede applications may have given the 20 mm thinning more efficacy compared to our previous two years of study where we applied Accede with a non-ionic surfactant adjuvant alone.

While we were unable to run statistics on the Gunnison trial, we harvested slightly more fruit from trees in our Accede treatment, suggesting our treatments were less efficacious in this study. The Gunnison trial did not include a tank mix of 6-BA or a non-ionic surfactant product, which may have reduced its efficacy relative to the Chazy trial.

By contrast, a trial in Idaho (*Fallahi and McArtney, 2021*) found Buckeye Gala treated with 350 ppm ACC had a lower fruit set and improved fruit size over an un-thinned control in two separate study years, and an ethephon treatment in one of two years. A 2015 study in Ontario, Canada, found 300 ppm and 450 ppm applications of Accede were effective at reducing crop load of Gala when applied at 17 mm, and 400 ppm was ineffective when applied at 22 and 25 mm (*Cline J, personal communication*). Our study differs somewhat from these previous studies, as we were applying Accede at 20 mm, complementing other hormone thinner applications made at petal fall, 12 mm, or a combination of the two.

In our Honeycrisp trial, we saw no significant differences between thinning treatments for total fruit at harvest. While we did see fewer fruit plus drops in treatment 3 compared with treatment 1, we did not observe a significant difference in % fruit set between any of our treatments. We also did not see a difference in fruit size, % red color, or crop value. This is in general agreement with our previous years of studying this material on Honeycrisp, which also suggests that Accede is a relatively mild thinning material on this variety.

In our Macoun trial, we saw no significant differences in total fruit per tree, yield per tree, or % fruit set. There was significant fruit drop in Macoun, and when these drops were added, we found a significant decrease in fruit per tree in treatment 3, where we used a bloom thinner, a 12 mm thinner, and a 20 mm application of Accede. However, we believe the 12 mm application was likely doing the bulk of the thinning in this treatment, as treatment 4 (bloom + 20 mm Accede) did not differ at all compared to treatment 1 (bloom thinner alone). We did see greater fruit size in treatment 3 compared to treatment 4, which also suggests that the 12 mm thinning application likely had the greatest impact on fruit quality in this trial year. We saw no differences between treatments in terms of % red color or overall crop value.

Our data suggest we likely had very little thinning activity from Accede on Macoun in the 2025 trial year, even when we added 6-BA to the application. This contrasts with our 2023 Macoun trial findings, where we had very good activity from our 20 mm Accede applications. We believe this block was heavily affected by a freeze in 2023, and have been told by the manufacturer to expect greater Accede efficacy following a freeze event. This likely explains the difference in responses observed, and, therefore, we believe that when trees and flowers are in good growing condition mild results from Accede in Macoun would be the expectation.

Accede evaluated as a thinner in Macoun at 16.9 mm in a 2022 Massachusetts trial (*Pinero et al., 2022*) did not thin there, although the authors note weather conditions were not ideal when the application was made. This agrees with our findings in 2025 that Accede may be a very mild thinner on Macoun.

Data on how return bloom will be impacted by the 2025 thinning treatments will be collected in the spring of 2026.

Economics

The thinning received from Accede applications may somewhat help reduce the amount of hand thinning required in these varieties. However, growers will need to carefully consider if the amount of additional thinning received from Accede will justify the expense of its application.

We estimate Accede costs approximately $260 per acre to apply. This includes the costs of Accede, the surfactant, and the associated labor. Hand thinning is labor-intensive, and labor costs are one of the largest expenses in managing an orchard in northern New York. If Accede can be used to get the trees closer to the target crop load without hand thinning, we believe there could be significant cost savings from utilizing Accede in some years where there was insufficient thinning from the bloom, petal fall, and 12 mm applications and weather conditions are conducive to good thinning activity at the 20 mm timing. However, we are yet to observe this in our data to date.

Weather Impacts

As in most years, the weather in northern New York must always be taken into consideration when we investigate thinning efficacy with any material.

Conditions were relatively good for bloom thinning in 2025. Weather forecasts were dry and temperatures were warm and very favorable, allowing growers the opportunity to aggressively bloom thin where they wanted to. Weather conditions were conducive to relatively mild to good thinning at the petal fall and 12mm thinning windows in 2025.

The Accede applications were applied on moderately favorable days. Daily highs were in the mid- to upper 70ºFs; however, carbohydrates balances were running somewhat positive at three of the four trial locations, likely resulting in mild thinning. We saw the most thinning with Accede at our Gala site, which had the most negative carbohydrate balance at the time of the 20mm application. This may explain some of the additional thinning we observed in this trial, though we also believe there may be differences in varietal susceptibility to this product as well, based on our previous years of data.

Accede is believed to work well under cooler temperatures, so it will be interesting to see how conditions will be on the days of application in future years. The manufacturer has suggested (*Clarke G, personal communication*) that Accede efficacy appears to be maximized when it is applied under slower drying conditions to maximize leaf uptake. Most of our applications were made early or late in the day to maximize its efficacy. However, when large commercial growers need to thin hundreds of acres, it is unlikely they are going to be able to spray all their acreage at the perfect timing.

Petal Fall Thinning Conditions				
Trial	Date	Daily High Temp (°F)	6-Day Weighted Carb Status Average (g/day)	Carbohydrate Model Predicted Thinning Conditions
Chazy Gala	28-May	82	-11.23	Good Thinning
Chazy Honeycrisp	28-May	82	-11.23	Good Thinning
Forrence Macoun	26-May	72	7.47	Mild Thinning
Gunnison Gala	N/A			

Table 11. Summary of petal fall thinning conditions. Evaluating the New Apple Thinning Material "Accede" Under Northern New York Thinning Conditions, 2025.

12 mm Thinning Conditions				
Trial	Date	Daily High Temp (°F)	6-Day Weighted Carb Status Average (g/day)	Carbohydrate Model Predicted Thinning Conditions
Chazy Gala	8-June	79	12.58	Mild Thinning
Chazy Honeycrisp	6-June	76	0.17	Mild Thinning
Forrence Macoun	3-June	79	-0.89	Good Thinning
Gunnison Gala	29-May	70	-5.42	Good Thinning

Table 12. Summary of 12mm thinning conditions. Evaluating the New Apple Thinning Material "Accede" Under Northern New York Thinning Conditions, 2025.

20 mm Thinning Conditions				
Trial	Date	Daily High Temp (°F)	6-Day Weighted Carb Status Average (g/day)	Carbohydrate Model Predicted Thinning Conditions
Chazy Gala	16-June	79	-6.01	Good thinning
Chazy Honeycrisp	11-June	78	33.34	Mild thinning
Forrence Macoun	8-June	76	7.53	Mild Thinning
Gunnison Gala	11-June	76	7.71	Mild Thinning

Table 13. Summary of 20mm thinning conditions. Evaluating the New Apple Thinning Material "Accede" Under Northern New York Thinning Conditions, 2025.

Conclusions

Accede has shown some efficacy as an apple thinner at the 20 mm fruit size, though efficacy appears to be somewhat variety-dependent. Our data currently suggest Accede, when applied under current label recommendations, is likely a relatively mild to moderate thinner on Gala, and a very mild thinner on Honeycrisp, Macoun, and NY-1. Like other thinning materials, its efficacy will also be impacted by factors like weather conditions before and after application, tree stress, etc. Growers may be able to use this material at 20 mm to remove some additional fruit off their Gala trees when thinning conditions are favorable, potentially decreasing the amount of hand thinning needed on their farm.

Education and Outreach

- 2025 Statewide Pink Webinar, May 1, 2025; Terence Robinson, Ph.D., discussed thinning strategies for the 2025 thinning season. Participants: 54. Video on Lake Ontario Fruit Program YouTube, 261 views as of January 7 2026.

- Thinning Meetings, May-June 2025, online for Northern New York growers. Dr. Robinson and NNYADP apple thinning project leader Mike Basedow discussed thinning conditions at petal fall and 12mm. Weekly attendance: 12-24 growers. Recordings and summaries of these meetings: ENYCHP Blog page.

- E-mail Alerts: following each thinning meeting, growers were emailed a recap of the discussed thinning recommendations, with additional details from model outputs from test sites in Peru, NY, reaching 678 Eastern/Northeastern NY fruit growers.

- One-on-One Outreach: growers participating in the thinning projects received frequent personalized emails, text messages, phone calls, and farm visits to discuss the models, and were given thinning advice based on these model recommendations.

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NNYADP Apple/Precision Orchard Research Reports (2013-2021):
https://nnyagdev.org/index.php/horticulture/nny-horticultural-research

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Photos:

Image 1. Fruit on Treatment 3 (left) at the Forrence Macoun trial prior to harvest. Trees receiving treatment 3 had fewer apples per tree than treatments 1 (right) and 4. Photos: Michael Basedow.