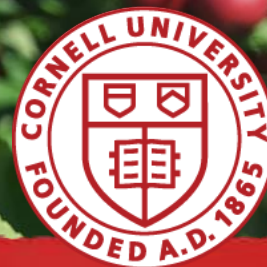


# Tree Fruit News

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## **Breaking the Biennial Bearing Cycle in Apple with Arrange™ PGR** *Win Cowgill, Professor Emeritus Rutgers University, Win Enterprises International, LLC* *Daniel J. Donahue, CCE Extension Associate-Tree Fruit Specialist, Cornell University*

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<http://www.horticulturalnews.org/101-3/Cover101-3.html> "Breaking the Biennial Bearing Cycle in Apple with Arrange PGR".

A major apple problem in commercial apple production worldwide is biennial or alternate bearing.

Many of our commercial apple varieties are prone to biennial bearing, but some are worse than others. Fuji is one of the worst, and Honeycrisp can be as well. Control of biennial bearing can be very challenging and certainly is one of the most difficult tasks apple growers face every year. Growers must use a number of management techniques to regulate fruiting and flowering to increase flower bud formation. Pruning, chemical thinning with PGR's, rootstock selection, and summer return bloom programs (Cowgill, Autio, 2016) with PGR's all can be used. We have gotten better at these practices with our precision thinning programs (Francescato and Robinson, 2016) and (Schwallier,

2015). There is another approach, however, that has been studied for over 50 years that will provide a complementary addition to the other programs for varieties that that are very biennial. That is the ability of gibberellins to inhibit flowering in pome fruit (Green, 2000). In 1981, Marino and Greene (1981) detailed the involvement of gibberellins in the biennial bearing of Early McIntosh apples. Schmidt (2006) did multiple experiments looking at croplod and flower manipulation with gibberellins and other PGR's on apple. Suppression of apple bloom with gibberellin sprays was shown by Unrath and Whitworth (1991).

There are many different commercially available gibberellins labeled for apples that result in better fruit quality (reduced russeting) and enhanced fruit set after a freeze at bloom. The historical work has shown that some gibberellins applied in the off year can reduce bloom in the on year, thereby reducing the biennial bearing cycle. Green (1992) found both GA<sub>4</sub> and GA<sub>7</sub> inhibited return bloom on Redspur Delicious, although GA<sub>7</sub> inhibited flowering more severely. Four sprays of GA<sub>3</sub> or three of

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Figure 1. Treatments applied to single trees with a Solo 451 sprayer.

GA4+7 at 250 mg·L<sup>-1</sup> essentially eliminated flowering in Gala, whereas it was not quite enough on Pink Lady. Davis (2002) observed that GA<sub>4+7</sub> more effectively suppressed flowering than GA<sub>3</sub> on Ramey York in Blacksburg, Virginia.

There are many different formulations of GA with different concentrations of the active ingredients. Personal communication with Jim Scruggs, Fine Americas, Inc., indicates that most commercial formulations of gibberellins for apple contain various concentrations of GA4 and GA7. What varies is the ratio of these two gibberellins in the commercial product. For instance, GA4 has a minimal effect on return bloom while GA7 is significantly more active according to Scruggs.

#### Arrange™ Trial New Jersey

Arrange™, plant growth regulator for use on apple was labeled in 2020 by Fine Americas, Inc. “to mitigate the biennial bearing cycle in apple varieties prone to producing crops in a biennial cycle”. When applied to trees in the “off” bearing year, when fruit load is low, Arrange can be used to reduce the return bloom of the apple trees in the following “on” bearing year when fruit set/load would normally be heavier.

In 2020 and 2021 multiple trials in New York and New Jersey were conducted to confirm the efficacy of Arrange to modify biennial bearing on apple in commercial blocks. This article includes brief results from the 2020 trial at Wightman Farms, Morristown, NJ. Two varieties were selected, Crispin and Fuji planted to a tall spindle system, on full dwarfing rootstock. Trees were 7-years old and approximately 11 feet tall for Crispin and 9 feet tall for Fuji. The study was set up as a completely randomized trial with 10 single-tree replications with no buffer tree on each side of the treatment tree.

Treatments were applied June 13, 2020 at 100 gallons per acre tree row volume with a backpack Solo 451 air powered sprayer (Figure 1). Only one application was applied. The label allows for multiple applications, but 100ppm total. Both Arrange treatments were

applied with Regulaid surfactant at 1 quart/100 gallons.

Treatments were as follows:

- 1) Untreated control
- 2) 100 ppm - label rate (1 gallon/100gallons)
- 3) 200 ppm - 2x Label rate (2 gallons/100 gallons)

In May of 2021, bloom was evaluated for each tree. The total number of flowering spurs was counted, and total number of resting spurs was counted. The binomial data set was analyzed using JMP software ver. 14.0 from SAS, Fit Y by X Platform, Analysis of Means of Proportions procedure, alpha = 0.05.

For Fuji, both treatments significantly reduced flowering (Table 1). One hundred ppm and 200 ppm reduced return bloom to 60% and 47% of spurs, respectively. For Crispin, both treatments also significantly reduced flowering, but the 100 ppm and 200 ppm were not significantly different from each other (Table 1). Reductions were 55% and 47% for 100 ppm and 200 ppm, respectively. These reductions in bloom should help break the biennial bearing cycle in these trees.

Table 1. The effects of Arrange application in 2020 on bloom in 2021 (percent of spurs flowering).

Application rate (ppm)	Fuji	Mutsu
0	75	74
100	60	55
200	47	47

#### Future and Ongoing Research

For the past three years we have been looking at GA<sub>7</sub> as Arrange for reducing flower bud formation on apple in the nursery and in first-year established apple orchards. While this is not a labeled use yet, the data are indicating that this may be an efficacious way that nursery apples can be treated to reduce or eliminate bloom so there is not a fireblight issue on the subsequent blooming of this newly planted trees. This has been a significant issue on newly planted high density apple orchards. More on this line of research will be forthcoming as data is collected.

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## If Your Farm is an SBA 'Small Business', You May be Eligible for Funding for Grants to Help you Respond to Coronavirus

**Elizabeth Higgins, CCE ENYCHP**

The recently announced *Pandemic Response and Safety (PRS) Grant Program* will provide grants between **\$1,500 to \$20,000** to food processors, distributors, farmers markets, and producers to respond to coronavirus, including for measures to protect workers against COVID-19. This is the link to the website for the program [Pandemic Response and Safety Grant Program - usda \(grantsolutions.gov\)](https://www.usda.gov/grantsolutions.gov)

### Important Dates:

- Application period opens October 6, 2021
- Application period closes at 11:59 p.m. Eastern Time on November 22, 2021

### What is eligible for funding?

Workplace Safety Measures: Workplace safety measures, including, but not limited to, personal protective equipment, sanitizer, hand washing stations, air filters, thermometers, cleaning supplies, or similar items.

1. Market Pivots: Market pivots such as transition to virtual/online sales costs (online platform development and fees, online marketing, credit card processing fees), supplies, new signage.
2. Retrofitting Facilities: Retrofitting facilities for worker and consumer safety (plexiglass, walk up windows, heat lamps, fans, tents, propane, weights, tables, chairs).
3. Transportation: Additional transportation costs incurred to maintain social distancing.
4. Worker Housing: Additional worker housing costs incurred to maintain social distancing or to allow for quarantining of new or exposed employees.
5. Medical: Unreimbursed costs associated with providing or

enabling vaccinations, testing, or healthcare treatment of infected employees, including any paid leave.

### What should you do to be ready to apply?

Applicants will be required to obtain a DUNS Number from Dun & Bradstreet (D&B) prior to applying for this program. D&B has created a custom landing page to streamline this process. Visit the application website (<https://usda-ars.grantsolutions.gov/>) for more information. **DO THIS ASAP!**

**DO NOT** register in the System for Award Management (SAM) prior to submitting your application to this program. After the application period closes, USDA will notify you if you are being considered for funding with the next steps for potentially receiving an award.

### Are You Eligible?

The determination as to whether a farm is an SBA small business is different than USDA definitions for a small farm. For example, a small apple farm is a farm whose revenue is \$5,000,000/year or less over a 3 year average. Check whether your farm is a small farm using this link. [Eligibility Info - usda \(grantsolutions.gov\)](https://www.usda.gov/grantsolutions.gov).

### Once the grant is announced

I will have a program on applying for this program on October 8<sup>th</sup> (Friday) at 4:00 pm assuming that the grant has been released. To register go to [https://cornell.zoom.us/webinar/register/WN\\_p2QHV1wPQbeJlt8ufrgLgA](https://cornell.zoom.us/webinar/register/WN_p2QHV1wPQbeJlt8ufrgLgA). For more information contact me (Liz Higgins) [emh56@cornell.edu](mailto:emh56@cornell.edu).

## Fall Weed Control in Orchards: A Quick Review

Michael Basedow, CCE ENYCHP; Janet van Zoeren, CCE-LOFP; and Lynn Sosnoskie, Cornell AgriTech

As we continue to work our way through this challenging harvest season, I'm sure the last thing anyone wants to think about right now is getting the herbicide rig out. However, if this fair weather keeps holding through October and early November, this fall might provide us a good opportunity to get some herbicides on after harvest.

In this article, I will briefly review some of the pros and cons of fall herbicide treatments, and reiterate some of the key recommendations from trials conducted by extension specialists in the fall of 2014 through 2016. (We are currently crunching the numbers from our pre-emergent herbicide timing experiment this season, so you can expect to hear about that at this year's winter meeting).

This is a quick review, so if you are interested in learning more I recommend giving the full Fruit Quarterly article, *Managing Apple Orchard Weeds in the Fall*, a read. It is available in the Winter 2016 print edition of Fruit Quarterly, or online [here](#).

### Pros of a fall herbicide application:

+ Applying your pre-emergent herbicides in the fall may help to remove one of the many time-sensitive chores off your to-do list during the following spring rush. (Your levels of control will be heavily dependent on your weed species mix). This can be particularly helpful in exceedingly wet springs where it might be difficult to get the sprayer out into the orchard in time.

+ Moisture is *usually* more reliable in the fall. Many of the pre-emergent herbicides we use require rainfall following application to help move the active ingredient into the seed germination zone. Some products require rain incorporation sooner than others do, and this time interval is usually listed on the label. For example, Matrix (rimsulfuron) will perform best if ½ inch of rain occurs within the 2 weeks following the application, while the Alion (indaziflam) label suggests efficacy will be reduced if it is not activated by rainfall within 21 days.

+ Some post-emergent products also perform very well when applied in the fall. For example, 2,4-D products work very well on perennial broadleaves when applied to their fall regrowth prior to the first freeze.

### Cons of fall herbicide application:

- In years where harvest runs late, we may not have enough time to get an herbicide application on. Weeds become less susceptible to many post-emergent herbicides after a frost, as the frost slows their growth and subsequent movement of the herbicide down to the roots. Many pre-emergent products must also be applied before snow covers the soil or the ground freezes.

- If the orchard floor is messy with leaf litter or dropped fruit in the fall, it will be difficult to get good contact between the pre-emergent herbicides and the soil surface.

- Branches weighed down with fruit are likely still hanging low and may come into contact with herbicide applications.

- Glyphosate is extremely risky in the fall and should not be used this time of year. Paraquat would be the post-emergent material of choice.

- Finally, winter annual weeds are not entirely bad! They hold the soil in place through the winter months, which can be particularly helpful in orchards on hillsides or in other areas where erosion has been a problem. Winter annuals are also fairly poor competitors in the spring during the critical weed-free period, as many will flower and brown out early in the season.

### General suggestions:

With these considerations in mind, here are some tips if you have a window for getting a fall application on this season:

- To get a good response from fall pre-emergent applications, the site needs to already be fairly clean to get good herbicide contact with the soil surface. This is particularly important for products like Alion (indaziflam), Matrix (rimsulfuron), and Chateau (flumioxazin). The herbicide strip should be cleaned up so that you are not applying over drops, leaves, and rootsuckers. Take care when cleaning up the strip though. For example, Alion should **not** be applied to heavily disturbed soil, as the risk of tree injury increases if there are open cracks in the soil that would allow the herbicide to contact the tree roots.



*For an effective fall herbicide application, the herbicide strip should be relatively bare ahead of the application for the residual to have good soil contact.*

- Your fall application should consist of both a post-emergent herbicide to remove the current vegetation, along with a pre-emergent material to prevent new weeds from germinating in

*(Continued on page 5)*



Weedy sites will have poor herbicide coverage in the fall, and low hanging branches that were weighed down with fruit can potentially come into contact with your post-emergent herbicide, which can cause some plant damage.

- the spring. Tank mixes should complement each other in terms of which weed species they control.
- When choosing which pre-emergent herbicide(s) to use on your orchards, choose products with good efficacy against your most problematic weed species. A table of commonly used orchard herbicide products, along with the weed species they control, can be found in the weed management excel file here.

- In their herbicide trials conducted in 2014-2016, Breth et al. found that Alion (indaziflam), Chateau (flumioxazin) + Prowl (pendimethalin), or Goaltender (oxyfluorfen) applied in the fall of 2014 provided the greatest residual control against their emerging weeds the following spring in Western NY. The next best group of treatments were Casoron CS (dichlobenil), Matrix (rimsulfuron), Simazine+ Diuron, and Sandea (halosulfuron-methyl). The team observed similar results in the Hudson Valley.
- In the Champlain Valley trial, Matrix, Sandea, or Alion applied in the fall of 2015 provided the best residual control against weeds emerging the following spring.
- For long-term management, pre-emergent products should be rotated between different modes of action. In the Western NY trial, the most effective long-term control was achieved with GoalTender in 2014 followed by Alion in 2015, and Alion in 2014 followed by Casoron in 2015. Note that all of these applications were followed in the spring with post-emergent materials to knock back weed cover during the critical weed free period.
- Please note: while the above listed products worked well in those particular locations, be sure to choose products that will target your unique weed species mix, and that are most appropriate for your soil environment. For example, Alion cannot be used in soils with 20% or more gravel content. Pre-emergent products will also have very little effect on perennial weed species, with the exception of preventing new seedling germination.

Table 2b. PWC for each treatment followed by percent control after post-emergence spray in 2015.

	TREATMENT Fall 2014	% weed Cover	Postemergent Spray	% weed cover				
		1-Jun	May 29-Jun 3	19-Jun	% control	2-Jul	15-Jul	31-Jul
A	Casoron*	32 d	Gly + Venue + MSO	6 bc	81	6 c	37 cd	42 cdef
B	Sandea + Prowl*	6.1 e	Unison spot	2 c	67	2 c	28 de	25 efgh
C	Goaltender*	9.6 e	Rely	0 c	100	1 c	5 gh	7 gh
D	Chateau + Prowl*	5.0 e	Unison Spot	4 bc	20	2 c	12 fgh	12 gh
E	Alion*	2.2 e	Unison Spot	0 c	100	0 c	2 h	2 h
F	Matrix*	43 cd	Gly + TreeVix + MSO	2 c	95	2 c	14 fgh	17 fgh
G	simazine + diuron*	8.9 e	Gly + Clean Amine	1 c	89	2 c	22 ef	30 defg
H	Sinbar*	33 d	Gly + Unison + Aim	3 c	91	1 c	15 fg	22 efgh
I	Unison + Gly	54 bc	Gly + Rely	12 bc	78	13 c	45 bc	51 cd
J	Gramoxone	61.1 abc	Gly	50 a	18	33 b	72 a	88 ab
K	Glyphosate	78.3 a	Stinger + Unison	46 a	41	58 a	79 a	94 a
L	Stinger	65 ab	Gly + Clean Amine	20 b	69	12 c	37 cd	45 cde
M	Untreated	71.7 ab	Gly + Unison	16 bc	78	28 b	57 b	63 abc

All plots treated with Gramoxone 2.5 pt/acre on 7 August 2015. Numbers followed by the same letters are not statistically different.

Percent weed control for each fall applied treatment in Western NY, including a follow-up spring post emergent spray, at four monitoring times during the following summer. Treatments A through H also included an application of paraquat at 2.5pt/acre at the time of residual application. Table from Breth et al., 2016.

**Table 5. Champlain Valley Fall 2015 Weed Control, Evaluation Spring 2016**

Material #1	Rate	Material #2	Rate	% Weed Cover	Weed Species Breakthrough
2,4-D	3 pt/A	na	na	85	OX, V, G
Glyphosate	3 qt/A	na	na	65	OX, V, M, LQ
Glyphosate	3 qt/A	2,4-D	3 pt/A	62	OX, V, M, LQ
Alion	5 oz/A	na	na	22	OX, V, G, HW
Casoron	2.8 gal/A	na	na	70	OX, V, G, M
Chateau	12 oz/A	na	na	36	OX, V, D, G, LT
GoalTender	4 pt/A	na	na	67	OX, V, G, HW
Matrix	4 oz/A	na	na	8	OX, V, G
ProwlH2O	4 pt/A	na	na	68	V, G, M, HW
Sandea	1 oz/A	na	na	18	OX, V, D, G
Stinger	0.67 pt/A	na	na	73	V, G, M
Control	na	na	na	92	See complete list

Percent weed cover in the spring following a 2015 fall herbicide applications in the Champlain Valley. Table from Breth et al., 2016.

\* no surfactants or Gramoxone used. Sprayed onto nearly bare ground.

KEY: OX: Oxalis, V: Vetch, D: Dandelion, G: Orchard Grass, M: Mustard, LQ: Lambs Quarters, LT: Lady's Thumb, HW: Horseweed

**Table 4. Summary of the seasonal average PWC for each treatment for each year and for the 2-year duration.**

TREATMENT 2014-15	Treatment 2015-16	14-15 AVG Percent Weed Cover	15-16 AVG Percent Weed Cover	2014-2016 Average Weed Cover
A Casoron*, Gly+Venue+MSO	Sandea + Prowl*, Gly+Unison	15 CDE	29 BC	20 CDE
B Sandea + Prowl*, Spot Unison	Sinbar*, Gly+CleanAmine	9 EF	34 B	19 DEF
C Goaltender*, Rely	Alion*, Rely	2 F	3 G	3 G
D Chateau + Prowl*, Spot Unison	Matrix*, Gly+Rely	5 EF	21 BCDE	11 EFG
E Alion*, Spot Unison	Casoron*, Gramoxone+Aim	1 F	6 FG	3 G
F Matrix*, Gly+Treevix+MSO	Sinbar + diuron*, Gly+Unison	11 DEF	25 BCD	17 DEF
G simazine + diuron*, Gly+CleanAmine	Chateau + Prowl*, Gly+CleanAmine	8 EF	17 CDEF	11 EFG
H Sinbar*, Gly+Unison+Aim	Alion+Matrix*, Gly+Unison+Aim	10 DEF	11 EFG	10 FG
I Unison + Gly, Gly + Rely	Alion*, Stinger+Unison	24 BC	27 BCD	25 CD
J Gramoxone, Gly	Alion+Matrix*, Gly+CleanAmine+Aim	38 A	15 DEFG	29 BC
K Glyphosate, Stinger+Unison	Alion+Matrix*, Gly+Aim	44 A	24 BCDE	36 B
L Stinger, Gly+CleanAmine	Goaltender*, Gramoxone+Aim	21 CD	18 CDEF	20 CDEF
M Untreated, Gly+Unison	Untreated, Stinger+Unison	34 AB	88 A	55 A

Numbers followed by the same letters are not statistically different.

**Percent weed cover for each year of the study, and the two year average weed cover for various treatment rotations in Western NY. Table from Breth et al., 2016.**

- For fall-applied post-emergents, paraquat is recommended over glyphosate, as glyphosate is likely to be taken up by the trees and exacerbate the risk of winter injury. If you do plan to use glyphosate in your perennial weed management program, **save it for treating weeds during the spring or early summer.**
- 2,4-D products are useful postharvest for controlling stubborn broadleaf perennials (thistles, bindweeds, etc.) across the orchard floor. It is also very effective for controlling dandelions in the grass alleys when applied at this timing. Avoid direct contact with the fruit, foliage, lower limbs, stems, tree trunks and any exposed roots, and avoid applying under conditions that favor drift. Do not apply to bare ground, or to light sandy soils.
- Where perennial grasses have been particularly troublesome, a fall application of Kerb 50W or Kerb SC (pronamide) is recommended. Kerb is applied in the late fall, once

temperatures are consistently below 55°F, but before the soil freezes.

- All post-emergents need to be applied before weeds are too tall for the best efficacy. Spraying them too late may lead to poor control, and risks injury to tree trunks if the boom needs to be set higher from the ground to spray over the tops of the weeds. Do **not** spray across the tree rows.

As always, review the label of any herbicide product you are planning to use, as each one contains many caveats as to how to best maximize the product's efficacy against the weed species you are planning to control. Feel free to get in touch with us to discuss your weed management scenarios.

**Literature Cited**

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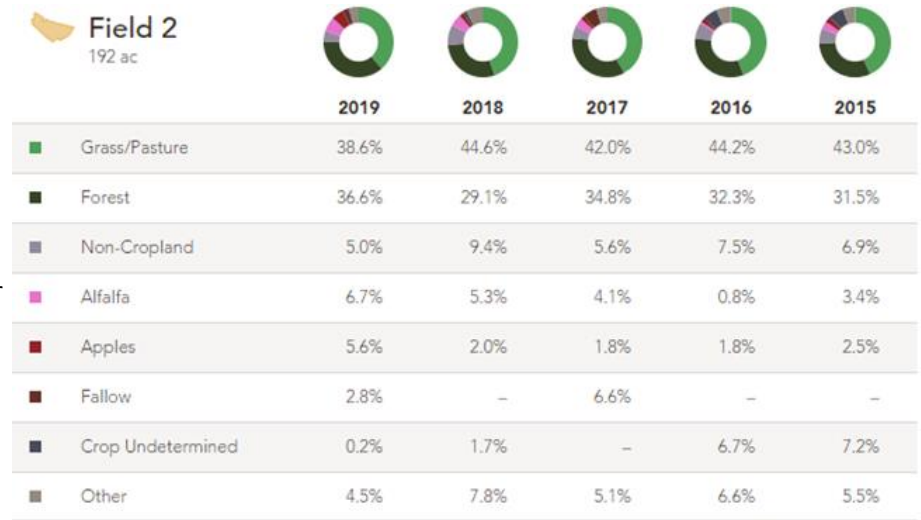
## New Resource Review—Acre Value

Elizabeth Higgins, CCE ENYCHP

I love data. I especially love it when it is in an accessible format. For anyone looking for farmland, [acrevalue.com](http://acrevalue.com) has the potential to be a really useful tool.

According to the website “AcreValue is the new way for farmers, land professionals, and landowners to research agricultural land. With the most comprehensive set of farmland data in one easy-to-use site, AcreValue provides the fastest way to research land and find current valuations.”

Unfortunately, land values are not available for New York. They are available for California, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Nebraska, North Carolina, Ohio, Oklahoma, South Carolina, South Dakota, Tennessee, and Wisconsin. However, in New York the website does allow you to click on a parcel and see the cropping history, the soils and in many counties, the owner of the parcel. Although this data is available through other sources, Acrevalue pulls it together for you. More filters and search tools are available for



Source: NASS Cropland Data Layer

Figure 1: Sample 5 year crop report

subscribers.

If you are looking for farmland or want to get a sense of how your land differs from the land of other farms this is a pretty robust, easy to use tool that you can use to acquire more information.

<https://www.acrevalue.com/>

## Performance of Honeycrisp on Budagovsky 10 in New York

Michael Basedow, CCE ENYCHP

I had a conversation with a Champlain grower earlier this season about Budagovsky (Bud) 10 rootstock for a future Honeycrisp planting. This rootstock is from the same breeding program as Bud 9, and is now showing up as an option from more nurseries. While I do not know of many plantings on Bud 10 currently in the Champlain Valley, here is some information on what we currently know about the performance of Honeycrisp on Bud 10 in Geneva. These data are from a rootstock trial conducted between 2010-2018 by Dr. Terence Robinson, in collaboration with the [NC-140 Regional Rootstock Project Group](#).

Geneva 2010 NC-140 Honeycrisp Planting Rootstock Performance					
	Survival (%)	Trunk Cross Sectional Area (cm <sup>2</sup> )	Cumulative Yield Efficiency kg/cm <sup>2</sup> TCSA	Fruit Size (g)	Biennial Bearing Index (Between 0 and 1, closer to 1 is more biennial)
Bud 10	89	17.6	5.35	249	0.49
Bud 9	100	9.4	5.81	224	0.58
G.11	100	15.0	5.93	255	0.53
G.41N	100	20.8	4.62	269	0.54
G.935N	100	22.7	4.22	252	0.58
G.214	100	21.8	4.49	257	0.58
M.9 NAKBT 337	100	19.6	4.69	263	0.50
M.9 Pajam 2	100	20.3	4.07	247	0.62
M.26	88	20.6	3.49	249	0.56
*Tukey's HSD (P =0.05)	34	16.7	1.88	40	0.34

\*For values between rootstocks to be statistically different, values must differ by the Tukey HSD value or more.

(Continued from page 7)

- Over the 8-year trial period, there was an 89% survival rate in NY of Honeycrisp on Bud 10. The one tree that died in the Geneva trial was from a broken graft union. Across the country, the average Bud 10 survival rate was 96%.
- Bud 10 trunk cross sectional area (a good proxy for tree vigor) averaged 17.6cm<sup>2</sup> in Geneva, similar in size to many of the other dwarfing rootstocks commonly grown in our region. Across the country, Bud 10 was placed by the researchers into a “moderate dwarf” size class, along with G.11, tissue cultured G.41, and M.9 NAKBT337. Bud-9 was put into the “small dwarf” category, while stool-bed produced G.41 was put into the “large dwarf” category, along with G.935, G.214, G.202, M.26, and M.9 Pajam 2.
- Cumulative yield efficiency (total yield relative to the size of the tree over the course of the trial) was similar to many of the other commonly grown dwarfing rootstocks in our region.
- Honeycrisp fruit size on Bud 10 in New York averaged 249g per tree (77 count), which was similar to other commonly grown dwarfing rootstocks in our region.

- In the above table, a value closer to 1 is more biennial, and closer to 0 is less biennial. Bud 10 was similar in its bienniality to many of the other commonly grown dwarfing rootstocks in our region.

For additional details on this and other rootstocks in the 2010 Honeycrisp trial, you can read the final report paper [here](#). You can find data from all the other NC-140 plantings [here](#).

While this reviews Bud 10’s performance in Geneva, we do not have much experience with it to date in Eastern New York conditions, so take these data with a grain of salt. Bud 10 is one of the rootstocks we have included in our 2021 rootstock plantings in the Champlain and Hudson Valleys, in collaboration with Dr. Robinson. Rootstocks in these trials include: B.9, B.10, M.9, G.890, G.935, G.214, G.257, G.969, G.213, G.41, and G.11. These rootstock trials were planted to Honeycrisp, Gala, and NY-1 in the Champlain Valley, and to Honeycrisp, EverCrisp®, and Gala in the Hudson Valley. We look forward to having more information on their performance in our growing conditions over the next few years.



*Our 2021 rootstock trial in Clinton County has 11 rootstocks from the Geneva, Budagovsky, and Malling breeding programs planted to Honeycrisp, NY-1, and Gala. The Columbia County trial has the same 11 rootstocks planted to Honeycrisp, Gala, and EverCrisp®.*



## Fall Sanitation Reminders

Janet van Zoeren, modified and updated from a 2018 article by Tess Grasswitz

While we've still got some harvesting to complete, there are some good IPM practices to keep in mind for the upcoming postharvest season. A summary of the recommendations for dormant-season cultural controls of various pests and diseases of both apples and stone fruits is provided in the tables below.

### Suggested Cultural Controls by Crop

Table 1: Apples

Timing	Disease/pest problem	Control tactic	Rationale
Early fall (as close to leaf-fall as possible)	Apple scab	Apply 5% urea to leaves on the orchard floor (40 lb feed-grade urea dissolved in 100 gallons of water per acre). Reduce subsequent nitrogen fertilization to prevent over-fertilization.	Accelerates decomposition, reduces over-wintering inoculum.
Post-harvest	Bitter rot	In affected blocks, completely remove decaying fruit from beneath trees or rake them to the row middles.	Reduces over-wintering inoculum.
Late fall	Apple scab	Use hail mower to chop leaf litter & dropped fruit.	Increases surface area of plant tissues to accelerate decomposition of over-wintering inoculum.
Dormant season	[General pest and disease management]	Prune during the dormant season to open up the canopy.	Improves air circulation, accelerates drying and improves spray penetration.
Dormant season	Fire blight	Prune out over-wintering infections (cankers). Make cuts at least 6 inches below any signs of dead bark (up to 12" if the canker edge is unclear). Remove & burn pruned material.	Reduces over-wintering inoculum.
Dormant season	Black rot, White rot, Bitter rot	Remove all dead, mummified fruit and cankers from affected trees. Remove & burn pruned material, or rake and chop them with a flail mower.	Reduces over-wintering inoculum and removes sites conducive to the proliferation of rots and <i>Nectria</i> .
Dormant season	Sooty blotch & flyspeck	Remove brambles from hedgerows next to orchards.	Removes alternate host plants to reduce inoculum sources.
Dormant season	Cedar-apple rust	Remove any Eastern red cedars in close proximity to orchards.	Removes alternate host plants to reduce inoculum sources.
Dormant season	Scale insects	Train workers to recognize our species of scale insects. Inspect bark for overwintering scales and mark 'hot spots' for later treatments (e.g. with delayed dormant oils).	Dense overwintering populations are easier to see when no foliage is on the trees.
Before spring	[General pest and disease management]	Empty and clean apple bins that will be stored close to orchard blocks	Reduces carry-over of pathogens and eliminates overwintering cocoons of internal fruit pests (e.g. codling moth)

(Continued on page 10)

(Continued from page 9)

**Table 2: Stone Fruits**

Timing	Disease/ pest problem	Control tactic	Rationale
Just after autumn leaf drop	Cherry leaf spot	Use rotary mower on orchard floor after leaf drop.	Increases surface area of plant tissue to accelerate decomposition and reduce over-wintering inoculum.
Post-harvest	Brown rot	Remove any fruit remaining on the tree after harvest (particularly in blocks with high disease levels). If possible, bury culled or rotting fruit.	Reduces over-wintering inoculum. Reduces risk of infection of adjacent blossoms the following spring.
Dormant season (before bud-break)	Black knot	Prune out and remove all shoots & branches bearing knots. Cuts should be made at least 6-8 inches below the knot. Burn, bury, or remove prunings.  Remove knots from wild <i>Prunus</i> species (e.g. wild cherries or plums) in adjacent hedgerows.	Reduces over-wintering inoculum.
Dormant season	Scale insects	Train workers on how to recognize different species. Inspect bark for overwintering scales and mark 'hot spots' for later treatments (e.g. with delayed dormant oils).	Dense overwintering populations are easier to see when no foliage is on the trees.

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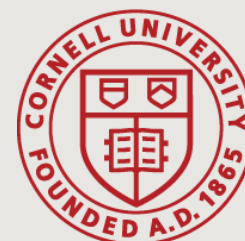
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**This is the last Tree Fruit News for the 2021 growing season. Starting in November, we will transition to the Produce Pages, our winter newsletter publication. Have ideas for future article topics you would like to see included in the Tree Fruit News? Please send your ideas to Mike at [mrb254@cornell.edu](mailto:mrb254@cornell.edu) or call at 518 410 6823.**



*The Eastern New York Commercial Horticulture Program is a Cornell Cooperative Extension partnership between Cornell University and the CCE Associations in these seventeen counties: Albany, Clinton, Columbia, Dutchess, Essex, Fulton, Greene, Orange, Montgomery, Putnam, Rensselaer, Saratoga, Schoharie, Schoharie, Ulster, Warren & Washington.*