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Tree Fruit News

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2021 Disease Management Outlook for Apple Powdery Mildew

David Strickland & Kerik Cox, Cornell AgriTech, Section of Plant Pathology & Plant-Microbe Biology

The 2021 Season so Far…

The apple growing season in 2021 has come early, necessitating that plans are made now to manage the major apple pathogens that benefit from trees' exit from winter dormancy. Apple powdery mildew, a disease intricately linked to host phenological stage, may be of concern this year due to the mild winter we've experienced since November 2020 and the (so far) warm early spring weather promoting early bud break. *Podosphaera leucotricha*, the causal agent of apple powdery mildew, overwinters within bud tissue. In cold winters, host buds die off when trees are exposed to sustained temperatures below -11.2°F (-24°C), reducing *P. leucotricha*'s ability to overwinter. However, according to the Northeast Regional Climate Center (nrcc.cornell.edu), the northeast US has experienced a warm winter, with average temperatures regionwide far above this "kill" threshold (Nov 2020: 43.1°F; Dec 2020: 31.2°F, Jan 2021: 27.1°F, Feb 2021: 24.9°F), indicating that *P. leucotricha* will probably have overwintered successfully.

With the onset of spring, trees will begin pushing buds and generating new tissues that *P. leucotricha* will colonize to establish primary infections (Fig. 1). A prolonged period of cooler days would help to slow tree growth, and subsequently, the start of powdery mildew symptoms. However, if April proves to be warm enough to significantly promote host growth, expect that powdery mildew primary infections will appear with greater frequency.

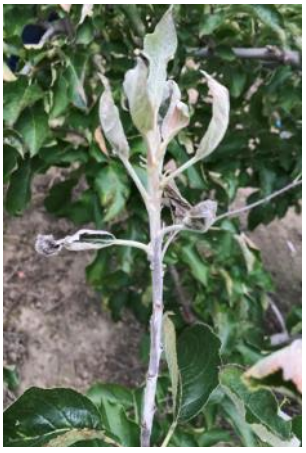

Figure 1: Primary infection of apple powdery mildew. Photo: K. Cox

Warmer temperatures are not the only factor influencing whether powdery mildew will be present in the early season. Precipitation has an impact on powdery mildew disease incidence. The spores of *P. leucotricha* (called conidia) cannot colonize host tissues covered in free water, a major difference from the wetness requirements for other foliar apple fungal pathogens such as *Gymnosporangium juniperi-virginianae* (cedar apple rust) and *Venturia inaequalis* (apple scab). In the early

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Figure 2: Secondary infection of apply powdery mildew. Photo: D. Strickland

season, *P. leucotricha* conidia are produced from primary infections and spread by wind to colonize new tissues and form secondary infections (Fig. 2). These secondary infections will perpetuate further secondary infections, producing exponentially increasing numbers of conidia for the remainder of the season, which are the focus of chemical management programs into the summer months. Should the next month or so be particularly wet due to frequent rainfall, powdery mildew may not be of concern in this year's early season. However, we note here the importance of keeping a vigilant eye out for powdery mildew development in your orchards. Extended warm periods without rainfall, typically a boon to growers as apple scab (the primary foliar disease concern) is not developing quickly in these conditions, would be very conducive to powdery mildew disease development and spread.

Management Options for Powdery Mildew

Management of powdery mildew relies primarily on a fungicide program, as pruning visibly infected shoots of overwintered fungal mycelium (primary infections) is usually too labor intensive. In New York, powdery mildew is typically managed with the same fungicide program as apple scab since most NY springs are wet and cool, necessitating a focus on the latter disease. Should this spring prove to follow the above trend, expect that powdery mildew will be well managed with your current apple scab chemical management program. Should the weather this spring instead become unseasonably warm with little precipitation, do not ease up on your fungicide application programs if you have a historical prevalence of powdery mildew in your orchards. A fungicide management program focused primarily on powdery mildew would start at tight cluster with applications of protectant fungicides such as sulfur or phosphorus acid. Note that for phosphorous acid-containing products listed for use in apple, such as Rampart, avoid application to plants treated with copper-based compounds at less than 20-day intervals to prevent phytotoxic effects. As bloom arrives, applications of single-site fungicides (e.g. Rhyme, Luna Sensation, Merivon) may be used to manage primary infections to reduce the amount of disease inoculum (conidia) that would otherwise spread elsewhere in the orchard. Alternating single-site fungicides with sulfur into the late spring/early summer months should provide adequate disease control. However, take care with sulfur applications during hot days (>85°F) as it may cause fruit russeting in warm wet conditions. Given concerns for fungicide resistance development, be sure to alternate fungicide modes of action when you select applications of single-site fungicides. Proper fungicide rotation will help maintain the efficacy of those limited commercial products registered for use in New York. In 2020, we received no reports of powdery mildew control failures in conventionally managed orchards.

For growers interested in using organic-approved chemical management programs, there are several OMRI listed products registered for use in New York to combat apple powdery mildew. Consider products such as Microthiol Disperss, Serenade Opti, and Double Nickel LC. In our experimental trials we have observed Rampart to also be successful, but note that it is not OMRI listed. These products often perform well under scenarios of low disease pressure. Severe disease pressure may not be adequately controlled in your orchard solely with biopesticides, so remain vigilant.

Ongoing Research at Cornell AgriTech

Our research program continues to explore different products and novel application programs to best manage apple powdery mildew. In 2021, we are evaluating the efficacy of several conventional fungicides, as well as additional OMRI listed products to provide better information and commercial options to growers augmenting their disease management programs. We are also exploring application programs rotating conventional fungicides with biopesticides to harness the benefits of both chemistries. This work, supported by a NE SARE grant, will be made readily available in future communications, so stay tuned!

Conclusion

An effective early disease management program for powdery mildew will limit primary inoculum in the early season but stay vigilant for the signs of secondary disease spread. Extended warm periods without precipitation are of greatest concern, as relaxed fungicide programs during this time may allow powdery mildew to develop unchallenged. Apple scab is of course the primary concern in New York State, yet do not discount the trouble caused by an entrenched powdery mildew incursion in your orchard.

Update on Vaccines for Farmers & Workers

Marie Ullrich, Eastern NY Commercial Horticulture Program

Neither farmers nor farmworkers were expressly added to the list for vaccinations. But as of 4/6/21, everyone over the age of 16 qualifies in NY.

Two of the 3 vaccines (Moderna and J&J) have a lowest age to administer of 18. Only Pfizer is labeled for 16 year-olds, so keep that in mind if you are looking to make an appointment for someone between 16 and 18, to make sure the vaccine being distributed is the one desired. Because the different vaccines have different temperatures for storage, not all facilities are equipped to handle all of them.

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If you are trying to help workers get the vaccine, have them see/call their usual health-care providers. In the lower Hudson Valley, SunRiver Health (formerly Hudson River Health) has traditionally been the farmworker outreach provider and vaccines are no exception. SunRiver is actively looking for vaccine patients these past couple of weeks.

There are no on-farm clinics planned, yet, but Sunriver can provide transportation to their clinics in many cases.

Quarantining H2A and other migrant workers: All workers who are coming from outside of NY or a contiguous state, must still follow travel advisory regulations that include testing requirements and/or quarantine. Since last year, these have changed a bit AND it requirements differ based on the specific state or country they are traveling from. Please go here: https://coronavirus.health.ny.gov/covid-19-travel-advisory for the current guidance. Because farmworkers are considered essential and may be exempt from quarantine to work check out this document: https://agriculture.ny.gov/system/files/documents/2020/05/agm-doh_covid19_cleaningfarm.pdf . Even if workers are exempt from the required quarantine, if possible, some measures should be taken to reduce the likelihood of infecting other staff or those sharing housing of they did not live, work, or travel together before arriving on the farm.

Many workers travel on public transportation to get from southern states to NY for our season. Possibly, more from Texas than usual due to their crop losses. If you are making the travel arrangements for a worker know that along with airlines, some bus companies are requiring testing prior to travel to comply with state regulations and/or improve cabin safety.

Stay tuned. CCE will send out updates as soon as anything changes.

*** Do not ask workers if they have any of the comorbidities. Respect their health privacy. Show them the list and then tell them to contact their healthcare providers on how to get a vaccination.*

Pre-Bloom Pest Management Reminders

Art Agnello, Entomology, Geneva (slightly modified by Mike Basedow)

Insect management duties ahead of bloom have always been somewhat transitory, and not nearly as urgent as at petal fall, but the following might help put the various possibilities into perspective for those that can take advantage of them this year.

First, if **San Jose scale** is a concern this season, there are suitable management tactics available before foliar development progresses too far to permit effective coverage. If you were intending to use oil, an application at 1.5-2% at delayed dormant, or a 1% spray through tight cluster can be quite effective, if you're able to thoroughly cover the wood surfaces. Insecticidal options include Centaur (34.5 oz/A), Esteem (4–5 oz/A), Lorsban (4EC or Advanced at 1.5–4 pt/A; or 75WG at 2–2.67 lb/A), Sivanto Prime (10.5-14 fl oz/A) and Venerate (2-4 qt/A). Remember that you are limited to only 1 application of Lorsban in apples per season, whether prebloom as a foliar or trunk spray, or as a postbloom trunk application, and you can only use one of the 15 products that have apple trunk sprays as a use on the label. This is the last opportunity to use the 15 Lorsban products still registered in NY up to July 31st. You should also check with your marketers to see if they also have additional chlorpyrifos restrictions.

The 15 chlorpyrifos products still allowable through July 31st of this year.

The full list of cancelled products can be found here: https://www.dec.ny.gov/chemical/122311.html

The July 31, 2021, cancellations apply to the following products:

Cancelled on July 31, 2021

EPA Registration Number	Product Name
19713-520	Drexel Chlorpyrifos 4E-AG Insecticide
19713-671	Drexel Lambdafos Insecticide
279-3581	Bolton Insecticide
34704-1077	Warhawk Clearform
34704-857	Warhawk
62719-220	Lorsban-4E
62719-220	Hatchet Insecticide
62719-220-1381	Agrisolutions Yuma 4E
62719-220-5905	Whirlwind
62719-301-10163	Lorsban 75WG
62719-591	Lorsban Advanced
62719-615	Cobalt Advanced
66222-19	Chlorpyrifos 4E AG
66222-19	Quali-Pro Chlorpyrifos 4E
66222-233	Vulcan

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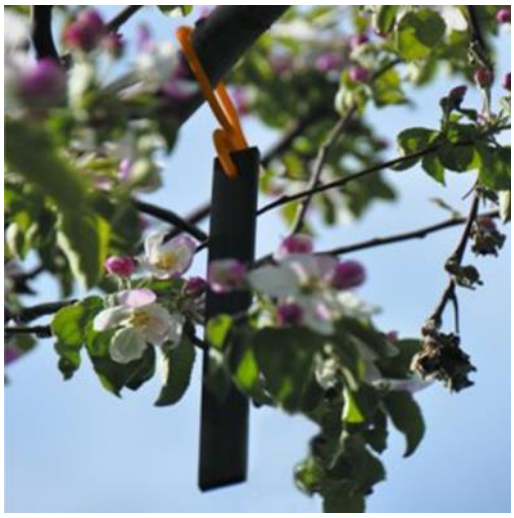
The pests of greatest concern at pink bud are usually rosy apple aphid (RAA), oriental fruit moth (OFM), and tarnished plant bug (TPB), with European apple sawfly and plum curculio on deck, optimally to be addressed at petal fall. In blocks with a history of **OFM** infestation, 1 or 2 traps checked at least weekly will help indicate the timing and relative size of the first generation population this year. What should be the response when the numbers start building? In a normal year, the average temperature ranges tend to result in very little egg hatch during pink and bloom, as this usually holds off until petal fall. For growers wishing to save A-list products like Altacor or Delegate until after petal fall, a B.t. product would be an option from pink through bloom. Regardless, don't neglect the value of using (and frequently checking) pheromone traps to set the clock on both OFM and codling moth development in specific blocks. Using these first capture dates, and the development models on NEWA, can help you more effectively time your first applications for the egg hatch period, when larvae will be most susceptible to your applications.

Also, the value of mating disruption as a component of **OFM and CM** management programs cannot be overstated. Prior to pink is the optimal time to deploy pheromones for both of these species; although CM starts to fly a bit later, our favored approach is to use products that incorporate the mating pheromones of both insects, so it's prudent to act prior to pink to ensure that you're ready for their emergence. These first flights of the season give us the best opportunity to get on top of internal worm control, because timing and development of the different stages only gets more complicated (i.e., less synchronized) as the season progresses. Options available include hand-applied products such as Isomate CM/OFM TT ties, Cidetrak CMDA Meso-A or OFM Meso-L dispensers, and mechanical aerosol dispensers such as Checkmate Puffer and Isomate CM/ OFM Mist.

Depending on block history and personal philosophy, **RAA and TPB** can be either annual challenges, puzzling but token annoyances, or a complete toss of the dice. Do they occur, do they need to be treated, are they able to be controlled adequately, and does it matter if they're just ignored?

It's possible to scout for RAA at pink, but this is often not practical, considering all the other things that will be demanding your attention at this time. TPB is not a good candidate for scouting, and if the bloom period is prolonged by cool, wet weather, a pink spray is of little use. You'll need to decide for yourself whether this bug is of sufficient concern to you to justify treating. We have seen few orchards in western NY (and only slightly more in the Hudson Valley) where TPB control is warranted, simply because the most effective treatment has been to use a pyrethroid, which: a) kills predator mites, and b) still rarely lowers TPB damage enough to be economically justified. If you elect a spray of Asana, Baythroid, Danitol, Gladiator, Pounce, Warrior or Beseige at pink for plant bug, you'll take care of rosy apple aphid (plus mullein plant bug and STLM) at the same time.

If RAA is your main concern, you could elect a pink spray (non-pyrethroid options include Actara, Assail, Beleaf, Esteem, Lannate, Lorsban, or Vydate) if you have the luxury of a suitable application window. Once again, be sure to consider potential impacts on non-target species such as beneficials, and be aware of your bee supplier's concerns about effects on pollinating bees.



OFM mating disruption dispenser in use. Photo: Trece, Inc.

Leafrollers will also be out there ahead of bloom, but only a portion of the population will be active at this time, so although you might get good control of any larvae you spray at pink, don't forget that the rest of the population won't be out (and susceptible to sprays) until bloom or petal fall, so it's probably better to wait until then to address this pest.

Dogwood borer deserves to be taken seriously as a potential problem in most orchards these days. While a pre-bloom trunk spray is an option, the recommended complementary tactic of mating disruption should be kept in mind for the period between pink and first adult flight in mid-June. If you're hanging ties or meso dispensers for leps ahead of pink, it could be convenient to multi-task and set out Isomate-DWB ties at the same time.

Finally, if **mites** normally need attention in a given block, and you haven't elected (or been able to use) a delayed-dormant oil application as a part of your early season mite management program, you'll be needing to rely on either: one of the ovicidal acaricides (Apollo, Savey/Onager, Zeal) available for use, whether before or after bloom; a rescue-type product after bloom (add Acramite, Banter, Envidor, Kanemite, Nealta, Nexter, and Portal to the above list) that can reduce motile numbers later on if they should begin to approach the threshold; or Agri-Mek, which falls somewhere between these two strategies. Like the true ovicides, Agri-Mek should also be considered a preventive spray, as it needs to be applied early (before there are very many motiles) to be most effective, generally within the first 2 weeks after petal fall. Recall that Proclaim and Minecto Pro are related to Agri-Mek, and also have miticidal activity, if you expect to use them at petal fall for leafrollers. For any of the rescue products, the operational threshold (through June) is an average of 2.5 motiles per leaf (see the chart on p. 77 of the Recommends).

More COVID Relief Funding is Available—CFAP, Extended PPP and additional Grant $$$

Elizabeth Higgins, Eastern NY Commercial Horticulture Program

The Biden Administration is releasing new COVID-19 stimulus funding. If you didn't take advantage of some of these programs last year, like PPP or CFAP, you are in luck!

Are you regretting your decision to not apply for CFAP 2 last year? You have another chance!

CFAP 2 provides payments based on 2019 sales to specialty crop growers. The application is simple, and the funds have arrived quickly. There really is no reason to not apply to this program. The program will accept applications starting on April 5th and should run until at least the end of June.

U.S. Secretary of Agriculture Tom Vilsack announced an expansion of the Coronavirus Food Assistance Program (CFAP) on March 24, 2021. CFAP updates include reopening of Coronavirus Food Assistance Program 2 (CFAP 2) for farmers who did not apply last year and they will also process the payments for certain applications filed as part of CFAP Additional Assistance.

Commodities eligible for the current Coronavirus Food Assistance Program signup period include those that were originally eligible for CFAP 2 and CFAP Additional Assistance – which is pretty much everything. A full list of eligible crops is located: CFAP 2: Eligible and Ineligible Commodities | Farmers.gov

For specialty crops the application is very simple – payments are based on sales in 2019 as well as crop insurance, WHIP+ or NAP indemnities you received for crop year 2019. To apply Coronavirus Food Assistance Program | Farmers.gov or call your local USDA FSA office.

PPP deadline extension

If you missed the deadline to apply for a first or second draw Paycheck Protection Program "loan", the deadline will almost certainly be extended to May 31st. If you never received a Paycheck Protection Program grant, you would be eligible for a "first draw" loan. If you received a Paycheck Protection Program grant, but your income declined by more than 25% in 2020 (CFAP funding would count as income) then you can apply for another PPP loan.

There are a few changes that make the program more attractive.

1. PPP loans/grants do not count as taxable income.
2. You can deduct business expenses paid for with PPP loans/ grants from your taxes. Some farms turned down PPP because of the possible tax implications.
3. If you file a schedule F or schedule C for your farm business you now use gross income not net income to base the salary of the owner for PPP payments – this can be a HUGE benefit to some farms.
4. You can now use PPP funds to cover costs of COVID-19 protections for workers and customers.

Value Added Producer Grant – It's a Good Year to Apply

USDA added an additional $35 million in COVID relief funds so $76 million is available for VAPG this year. The VAPG usually requires a 1 -1 match (for every grant dollar you need to provide a dollar of cash or in-kind match). This year the match requirement has been reduced to 10 percent for the grants that are funded with COVID funding. These will be the highest ranked projects. The rest will require the standard 1-1 match. You can apply for the grant assuming only a 10 percent match, but may be required to provide a 100% match if you are a lower ranked project. You are not required to show that your business was impacted by COVID in order to be eligible for the COVID funding. It is just based on project quality/ priority ranking.

This year they also removed the preference for cash match over in-kind match for scoring proposals.

Other Funds?

The recent COVID-relief package has definitely increased funding to the Local Foods Promotion Program and the Farmers Market Promotion Programs. These programs generally are available in the spring and farmers can apply for them. They could help with things like on-line sales and marketing, home delivery and other changes you may be making to your operation. Grants & Opportunities | Agricultural Marketing Service (usda.gov)

There will likely be additional opportunities, especially in local foods, assistance in providing PPE and protective measures for farm workers, increased farm to school funding and food donation support, assistance for organic certification and specialty crops – according to the announcement. But what these will look like is yet to be determined….

Problematic Weeds and Guidelines for their Management

Michael Basedow, CCE Eastern NY Commercial Horticulture, Janet van Zoeren, CCE Lake Ontario Fruit Program, and Dr. Lynn Sosnoskie, Cornell AgriTech

During the weed management session of the 2021 Cornell Tree Fruit Conference, we asked attendees to type in their most problematic weed species. We tallied up the responses, and on the next page you will find the most commonly named weeds that received more than one mention.

This informal survey suggests Canada thistle, field bindweed, and quackgrass present the strongest management challenges for those that responded. With this in mind, we will discuss management strategies for these three species.

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Weed	Number of people who mentioned it as being a problem
Canada thistle	32
Field bindweed	25
Quackgrass	11
Poison Ivy	8
Horsenettle	7
Yellow nutsedge	6
Rootsuckers	3
Wild Buckwheat	2
Horseweed	4
Milkweed	2

Figure 1: List of problematic weeds from our winter tree fruit conference.

Canada Thistle

Canada thistle (*Cirsium arvense)* is a common broadleaf perennial weed. It produces an extensive root system, which can spread up to 17 feet across and reach 20 feet deep. It forms a rosette of spiny, lobed leaves (Figure 2), which will emerge from its roots (vegetative reproduction, leading to large stands dense with thistle) during both a spring and fall flush of growth. Canada thistle can also spread through seed dispersal. Seeds germinate about the same time as the spring flush. A single large seed head can produce up to 5000 seeds (Figure 2), and a new plant can sprout from as little as a single inch of root segment.

Management

- Casoron (Dichlobenil, WSSA Group 20) provides partial control of perennial weeds, including Canada thistle. Casoron 4G (granular formulation) must be applied between November 15 and February 15, which is not always practical in our region. The CS formulation provides somewhat more flexibility, as it must be applied when air temperatures are less than 70°F and before seedlings are two inches tall in the early spring.
- Matrix (Rimsulfuron, WSSA Group 2) can provide partial control of Canada thistle. Matrix should be applied to small actively growing Canada thistle only once it has emerged.
- Stinger (Clopyralid, WSSA Group 4) is another post-emergent material for the control of thistle. It should be applied to Canada thistle from the rosette to the bud stage to keep plants from setting seed. It cannot be applied during apple bloom. Clopyralid can also be applied to thistle postharvest, but should go on prior to the first frost while the plant is still actively growing and healthy.
- 2,4-D (another WSSA Group 4) will also provide partial control when used at similar timings as clopyralid.
- Contact products such as Rely (glufosinate, WSSA Group 10), Gramoxone (paraquat, group 22) and group 14 products like Venue (pyraflufen-ethyl) and Treevix (saflufenacil) will also burn down emerged foliage.
- Mowing while the plant is flowering will keep Canada thistle from setting new seeds, but no mowing should be done for at least ten days following a systemic herbicide application to ensure chemical movement out of the treated tissues.
- Multiple seasons of good management practices will be necessary to gain control of this difficult weed.

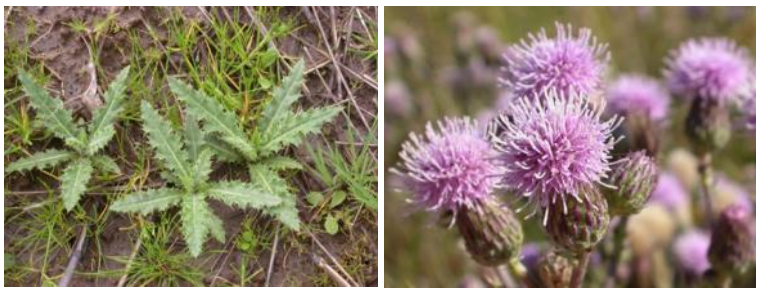

Figure 2: Canada thistle of rosette of spiny lobed leaves (left), flowers, and seed head (right). Photos: Dr. James Altland, Oregon State University.

Field Bindweed

Field bindweed (*Convolvulus arvensis*) is a perennial broadleaf that spreads by seed and through its large, creeping root system (Figure 3). Bindweed's tap roots, which can grow to more than 30 feet long below ground, facilitates its persistence and tolerance of environmental stress and most weed control tactics. Bindweed has arrowhead-shaped leaves that are simple and alternate with a flattened base and a rounded tip (Figure 3). It has white or pink, funnel-shaped flowers that are one to two inches across (Figure 3). The species can be confused with another perennial bindweed, *Calystegia sepium* (hedge bindweed), which produces larger leaves (with a deeply lobed base and pointed tips) and flowers.

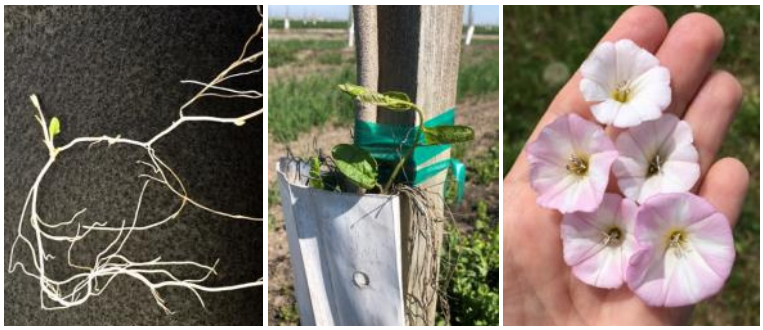

Figure 3: Field bindweed has a creeping root system (left), produces arrowhead-shaped leaves that are simple and alternate (center) and has white or pink, funnel shaped leaves (right). Photos: Dr. Lynn Sosnoskie.

Management

- Field bindweed is best controlled prior to planting, through frequent cultivations and systemic herbicide applications.
- Once the orchard is planted, late fall/early spring applications of Casoron (Dichlobenil, WSSA Group 20) can provide control when seedlings are small. Be mindful of the timing limitations associated with these products, as spring applications must be made between Nov 15 and Feb 15 for the 4G formulation, and when air

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temperatures are less than 70°F and before seedlings are two inches tall for the CS formulation.

- Early applications should be followed up with spot treatments of a systemic product. Remember that 2,4-D, an auxinic herbicide, cannot be applied at apple bloom.
- Contact products like Rely (glufosinate, WSSA Group 10), Gramoxone (paraquat, Group 22) and group 14 chemistries such as Aim (carfentrazone-ethyl) and Venue (pyraflufen-ethyl) may also be used to burn back foliage.
- Mowing is rarely an effective strategy for controlling field bindweed as the prostrate vines often grow under the height of a mower deck.

Figure 4: Established quackgrass in an orchard row middle spreads both by seed and through underground stems.

Quackgrass

Quackgrass (*Elymus repens)* is a perennial grass that reproduces by seed and through underground stems. The plant reaches 20 to 40 inches tall, with leaves 2 to 13 inches long and 1/8 to ¾ inches wide. It is found in most cultivated fields, and is very difficult to eradicate once it becomes established (figure 4).

Management

- Casoron (Dichlobenil, WSSA Group 20) is labelled for controlling quackgrass. The CS formulation lists quackgrass as moderately susceptible. Again, note the 4G formulation must be applied between Nov 15 and Feb 15 and the CS should be applied early spring when air temperatures are less than 70°F and before seedlings are two inches tall.
- Matrix (Rimsulfuron, WSSA Group 2) will provide postemergence quackgrass control when applied to plants that are 4 to 8" tall. Quackgrass not emerged at the time of application will not be controlled or suppressed, and would require a second post-emergent application for acceptable control.
- Sinbar (Terbacil, WSSA Group 5) usually provides partial control of quackgrass.
- Poast (Sethoxydim, WSSA Group 1) can provide control of quackgrass. It should be applied to quackgrass in the spring before the grass reaches a height of 8 inches. Up to 7 applications can be made per season, with at least 14 days between each application.
- Rely (Glufosinate, WSSA Group 10) can also provide burndown control of quackgrass.
- Kerb (Pronamide, WSSA Group 3) will provide some pre and post emergent control of quackgrass, but applications must be in the fall, after the fruit is harvested and prior to soil freeze-up.
- Mowing can also be used to help suppress quackgrass. It should be mowed as close to the ground as possible to deplete the reserve of carbohydrates within the rhizomes. Wait to mow following any systemic application, to allow the product to fully move out of the treated tissues.

A note on glyphosate use for perennial weed management

Glyphosate can be an important tool in a perennial weed management program, as it is both non-selective and systemic, allowing it to be translocated from the foliage down into the storage tissues. There are a few key points to keep in mind if you plan to use glyphosate.

- **Due to glyphosate's broad spectrum and systemic properties, it must be used with caution to prevent injury to the apple trees.** It should only be used in the spring, not beyond early July. Later applications risk uptake by the trees, increasing the potential for sub-lethal damage and winter injury. Every measure should be taken to keep the herbicide from contacting the tree foliage, root suckers, and trunks.
- **To get the most out of glyphosate's systemic properties, timing is critical.** For many weeds, it is best to apply in the spring prior to bud formation up through the flowering period, as this is the period when plants are actively growing and when phloem-mobile products are most likely to be translocated to the roots. Check the label for specific use instructions for the weed species you are looking to treat so that you are treating at the optimum timing.
- **Pay close attention to the weed's growth status, and to any adjuvant recommendations.** Stressed plants do not uptake systemic products as readily as rapidly growing plants. In hot, dry conditions, control will likely be more limited than in years where there is a healthy flush of weed growth.
- **Look closely at the recommended adjuvants.** Pay close attention to adjuvant recommendations for the particular weed species you are looking to control with glyphosate. Many species require the addition of ammonium sulfate to the mix to optimize weed control.

For a full review of the effects glyphosate can have on the apple orchard, we recommend the following Fruit Quarterly article from 2013: http://nyshs.org/wp-content/uploads/2016/10/Pages-23-28-from-NYFQ-Winter-12-12-2013.cmc_.pdf

Always read the label before choosing a product and making an application. Each product has specific product use and tree age restrictions that are pertinent to your operation. Many herbicides can cause damage to trees if they come into contact with sensitive tissues; check labels regarding safe spraying requirements. While some pre-emergence herbicides can control small, emerged, annual weeds, a burn-down herbicide may be required to achieve complete vegetation control. Active ingredients vary with respect to their spectrums of control; reference product labels regarding tank-mixing recommendations. While we make every effort to provide up to date information, remember that ultimately the label is the law.

Upcoming Events & Important Information

Dear Hudson Valley Lab Stakeholder,

I am writing to update you with several staffing changes that have recently occurred at the Hudson Valley Lab. Senior Extension Associate Dr. Srdan Acimovic and Extension Associate Dana Acimovic have accepted positions at Virginia Tech and they will be departing Cornell in late May. Additionally, Senior Extension Associate Peter Jentsch has announced that he will be retiring from Cornell University in August 2021. We are thankful for all of the contributions Peter, Srdan and Dana have made at Cornell and wish them well in their future endeavors. During this transition, we are working closely with Cornell Cooperative Extension staff, including ENYCHP, to provide extension support to regional growers.

We invite important stakeholders like you to participate in a new survey assessing the current extension and research needs of Eastern New York growers. The results of this survey will help us improve Cornell's efforts within the region. We are hopeful you will complete the survey by Friday April 16th so we can begin to evaluate needs and adjust our offerings accordingly. The survey may be accessed through this link: https://cornell.ca1.qualtrics.com/jfe/form/SV_8FU0WX7fiN9uDsy.

The Cornell University College of Agriculture and Life Sciences has been an integral partner to Hudson Valley growers going back to the early 1920s. We believe the Hudson Valley Research Lab serves an important role in ensuring the profitability and sustainability of agriculture in Eastern New York and we are committed to the lab's continued success with our research and extension support. Thank you for this opportunity to serve you.

Sincerely,

Jan P. Nyrop
Associate Dean, College of Agriculture and Life Sciences
Goichman Family Director, Cornell AgriTech, Geneva, NY

Northeast Winter Fruit Seminar Series: Recordings Available Online

If you were not able to attend any of the Northeast Winter Fruit Seminar series online meetings, all of the meetings were recorded and are available online at the UMass Extension Fruit Team YouTube page, and are available to view at your convenience. Below are the links to each meeting:

Keeping Peach Trees Healthy and Productive
Orchard Invasive Insects; Monitoring, ID, and Biological Control
Apple Maggot Management
Early-Season Apple Insect Pests
Honeycrisp Bitter Pit and Scald Management, and Ag Radar
Tree Row Volume: What it is, why it matters and how to use it.
NEWA 3.0 Update
Cider Apples 2021: Where Do We Stand Part 1 and Part 2

This series was presented to you by the New England Extension Fruit Educators Consortium which consists of: Ms. Elizabeth Garofalo, Mr. Jon Clements, Extension Educators, University of Massachusetts Extension Fruit Program; Dr. Terence Bradshaw, Assistant Professor, University of Vermont; Mr. Jeremy Delisle, Ms. Olivia Saunders, Field Specialists, UNH Cooperative Extension, Fruit and Vegetable Team and George Hamilton, Food & Agriculture Field Specialist, UNH Cooperative Extension, Hillsborough County; Dr. Renae Moran, Professor of Pomology and Mr. Glen Koehler, Associate Scientist Maine Food and Agriculture Center, University of Maine; Ms. Heather Faubert, Research Associate, University of Rhode Island Cooperative Extension; Ms. Mary Concklin Visiting Extension Educator, IPM Program Coordinator, University of Connecticut.

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, Schenectady, Schoharie, Ulster, Warren & Washington.

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