



Maine Tree Fruit Newsletter

Friday, April 15, 2022 Vol 29:6

Apple bud stage estimates

Coastal New England is running slightly ahead of normal for cumulative degree days (base 40F) that are used to track and predict apple bud stage development. Consequently, the Green Tip (GT) date in Rhode Island, while 3 days later than in 2021, was about 5 days ahead of the long-term average date.

Farther from the coast in Hudson Valley NY, the GT date was about 3 days ahead of normal. In western MA, where DD accumulation has been close to normal, the McIntosh Green Tip date was right at the average date on April 11, and about 6 days later than in 2021.

DD accumulation in south-coastal Maine is slightly ahead of normal. McIntosh Green Tip in Sanford is expected for Friday April 15 vs. the long-term average of ca. April 20. Further north at Highmoor Farm in Monmouth and in the Turner-Buckfield area, the average GT date at Highmoor is April 24. The warmth over the next few days could push McIntosh fruit buds to reach GT this weekend.

The dates shown in the table to the right are a rough guess at how apple budstage dates may evolve at Highmoor Farm in Maine in spring 2022. It is based on a presumed GT date of Sunday, April 17 and the current 10 day weather forecast for April 15-25, the 11-28 day weather outlook temperature anomaly estimate for April 26-May 12, and climatic average temperature beyond May 12.

The relatively early GT date and a couple of days of cool temperature early next week contribute to a lag between GT and Half Inch Green. These dates are close to the long term average for each budstage. A more informed estimate for budstage dates will be possible once we have the observed GT dates and updated weather forecast.

Date Bloom start & end dates in brown.	Observed & Predicted McIntosh bud stages
Sun, Apr 17, 2022	50% Green Tip
Mon, Apr 18	
Fri, Apr 22	
Sat, Apr 23	
Sun, Apr 24	
Mon, Apr 25	
Tue, Apr 26	
Wed, Apr 27	
Thu, Apr 28	
Fri, Apr 29	
Sat, Apr 30	
Sun, May 1	Half-inch Green
Mon, May 2	
Tue, May 3	
Wed, May 4	
Thu, May 5	
Fri, May 6	
Sat, May 7	early Tight Cluster
Sun, May 8	Tight Cluster
Mon, May 9	
Tue, May 10	
Wed, May 11	
Thu, May 12	Open Cluster
Fri, May 13	
Sat, May 14	
Sun, May 15	full Pink-extended
Mon, May 16	
Tue, May 17	
Wed, May 18	
Thu, May 19	
Fri, May 20	late Pink
Sat, May 21	
Sun, May 22	King Bloom
Mon, May 23	
Tue, May 24	Full Bloom
Wed, May 25	
Thu, May 26	
Fri, May 27	
Sat, May 28	
Sun, May 29	95% Petal Fall
Mon, May 30	100% Petal Fall

Early season Apple Scab Management

In most cases, pest management at Green Tip is more about diseases than insects mites or weeds, with Apple scab the most immediate concern. There are multiple factors that affect scab infection pressure for an infection period. For the apple scab fungus three factors are the number of ascospores per square meter of orchard floor, the % of spores mature and thus ready for release, and the portion of the mature spores that actually do release. The density of spores per square meter of orchard floor is the most variable and thus most important factor. In fact it so far outweighs the other factors that the earliest, coldest infection periods in a high-scab orchard can be orders of magnitude more intense than the warmest peak infection period in a low-scab orchard.

As for development of the scab spores present, maturity at GT can vary between years. Without late snow cover this year maturity should be about normal relative to GT this year. In years with late snow cover scab maturation can get an early start. If that assumption holds true, only a very small portion of the available spores will be ready for release until at least Half inch Green, and it will take until about Tight Cluster for scab spore maturation to accelerate.

Once it does accelerate, the rest of the spores mature between Tight Cluster and Petal Fall (PF), or slightly later than PF if there is a dry period that allows bud growth to continue but makes the overwintered leaf litter too dry to support scab spore development.

A third factor is conditions during an infection period. Almost all of the available apple scab ascospores that have matured and are thus ready for release will do so if the temperature is warm enough (over 50F) and if there is enough soaking rain (over 0.10 inch) and daylight ((after 7am). Only a very small portion of the mature spores will release if all three conditions are not met (i.e. night-only rain of less than 0.1" and average temperature below 50F). That portion is so small that unless the population is extremely high, the infection risk is negligible. The night/day daylight factor has the greatest effect on spore release, with only about 5% of available spores released at night.

If there is daytime rain, and one of the other two requirements for a full release are not satisfied (i.e. too cool at <50F, OR not enough rain at < 0.10 inch) then the portion of mature spores ready for release that actually do release is cut in half. If both of those conditions are not met then only about 25% of the available spore will release for an infection period, and will be available for the next infection period..

This usually becomes a moot point by Pink with most infection periods having both enough temperature and total daylight rain to allow essentially a full release of that portion of the spore population which has had time to mature and that had not been release by previous rains. But early in the season from Green Tip to Tight Cluster the scab infection pressure can be strongly affected by the specific weather conditions.

Estimating percentage release only has meaning in terms of % of what. That is where total inoculum load comes into the equation. An orchard that had a high scab population the previous year, and that did not receive sanitation measures to reduce the number of overwintering leaves, can have a very large number of scab spores per square meter. Conversely, an orchard with excellent scab control last year, combined with sanitation measures such as leaf shredding, urea application, or both to reduce the overwintering scab population can have only 0.01% or less the number of spores per square meter. That is why plant pathologists keep preaching about the importance of sanitation measures. It is a lot easier to prevent new infections from 10 or 100 spores per square meter than 1,000,000 per square meter.

If you did not use any scab sanitation last fall it is not too late to shred leaves and/or apply urea to hasten leaf decomposition. It is more effective in the fall, but still worth doing now, especially if there was a noticeable number of scab lesions on leaves last fall.

Plant pathologists disagree on the need for scab control at Green Tip, Half inch Green, or even Tight Cluster in very low-scab orchards. One perspective is that any scab that starts so early will have time to progress to producing thousands of spores by Fruit Set when tender fruit tissue is exposed. By that reasoning scab control must begin with the earliest possible risk. The alternative view is that the risk of infection is so low during the early bud stages in a low-scab orchard that there is essentially nothing to protect against and thus the fungicide/cost/effort is wasted. And even if a few early scab infections did occur, it would only be on leaf tissue not fruit. Subsequent fungicide protection with a systemic fungicide would prevent it from reaching the spore-producing lesion stage. And in the worst case scenario of spore-producing scab lesions developing, subsequent protectant fungicide coverage would prevent spread to other foliage and fruit..

Copper Considerations

A copper + oil application at Green Tip serves multiple purposes. Copper is a good scab fungicide, so sets up a base level of protection for subsequent infection periods. Highly water soluble copper sulfate tends to release all the copper ions with the first wetting, whereas less soluble fixed coppers gradually release over an extended period of wettings.

The solubility of copper fungicide formulations varies. From the most soluble to least soluble they are:

Copper sulfate, copper sulfate pentahydrate: (MasterCop, Magna-Bon)

> Copper hydroxide (Champ, Kentan, Kocide, NuCop, Previsto)

> Copper hydroxide/oxychloride combination (Badge)

> Copper sulfate/oxychloride (COCS)

> Basic copper sulfate (Basic Copper 53, Cuprofix Ultra, Cuproxat, AND Cuprous oxide (Nordox).

The tradeoff for slower release is greater potential for phytotoxicity from copper release later than desired when sensitive fruit and leaf tissue is exposed.

Copper is a general biocide that disrupts essential enzymes that both pathogen and apple foliage and fruit cells need to function. At Green Tip there is not much of a concern about apple phytotoxicity, but it does become a concern after Quarter-inch green tissue is exposed. Copper labels vary in how late application is allowed. The risk of phytotoxicity from early season copper application is lessened with normal rain frequency. The risk increases if there is an extended period without rain between Half-inch Green and King Bloom. Of course you can't know how the weather will arrive over the next month, but it is still worth being aware of the copper-rain connection when looking at the weather. More immediately, longer drying time increases the risk of copper phytotoxicity.

Another factor to be aware of is the effect of spray water pH and other tankmix partners on copper phytotoxicity. Experiments in PA showed that if the tankmix is too acidic, e.g. a pH below 6.5-7, it can increase copper activity and thus also phytotoxicity. This was a summer spray trial not at Green Tip, but the point that pH affect copper phytotoxicity still applies. Phosphoric acid fungicides (Phostrol, Prophyt, Rampart) should not be tankmixed with a copper product. Nor should foliar fertilizers or most adjuvants, especially adjuvants that acidify the tankmix.

A pH meter is a worthwhile investment that once calibrated is easier to use and more accurate than paper pH test strips. The pH of water sources can vary not only from day to day, but surface water pH can vary by 5 whole units within the same day. In addition to pH being too low, pH being too high is also a problem. It makes sense to monitor pH for each day's spray operations. Fungicides tend to be more sensitive to high pH than insecticides. But Imidan insecticide is the most well-known product with high sensitivity to high pH. At pH 8.0 its half life is shortened to four hours. Other products in the tankmix can also change the pH.

Copper formulations also vary in the amount of metallic copper content. The effective price is for a dormant-delayed dormant copper application is the cost per pound of metallic copper, not the cost per pound of product. Two pounds of copper per acre is recommended for early season application.

Many copper formulations are OMRI list for organic use. But within the same brand name some formulations are on the OMRI list and others are not. For example: Badge X2, Champ WG, and most NuCop formulations are on the OMRI list. But Badge SC, Champ Dry Prill, Champ Formula 2, and NuCop XLR are not OMRI certified.

Copper application also makes the tree surfaces less suitable for fire blight bacteria that happen to land there to be able to survive. For effective fire blight sanitation, good coverage of the entire tree and the entire orchard is needed, not just any fire blight hot spots. A low rate of oil (0.25% = 1 quart oil per 100 gals. water) should be added to a copper application to increase efficacy.

Copper is just a preliminary base fire blight suppressant. If you had noticeable fire blight last year, consider a multi-step defense this year beginning with Actigard at Pink. And consider having a streptomycin alternative on hand in case you need multiple bacterial suppressant sprays during bloom. Even if you did not have fire blight last year, now is the time to make sure you have enough streptomycin on hand for at least one full-orchard treatment.

Early season insects and mites

Penn State recommends oil at 3-4% for San Jose Scale. You don't need 4% to smother European red mite (ERM) eggs. At Half -inch Green the oil concentration to smother ERM should go down to 2%.

Green tip is a good time to watch for Green Pug Moth or Winter Moth larvae invading buds. Spray timing would later be around Half inch green or Tight cluster when they become exposed again as the move between buds.

The need for Rosy apple aphid control in Maine orchards seems minimal, but if your orchard is the exception, Half-inch Green is an effective timing. Treatment timing for Tarnished Plant Bug is better left for after Tight Cluster. But now is the time to set white sticky traps to monitor the population to see if TPB control at Pink is warranted. Otherwise TPB control can wait until after Petal fall if it is needed at all.

Pear Psylla (PP) is only a pest on pears, but it is the worst insect pest on pears. PP control begins with oil application prior to and during bud break and the initial stages of foliar growth. This requires a high volume spray that includes horticultural oil at ca. 2% concentration (of course as always, check the product label for the actual rate to use). Soaking coverage is necessary for the oil to suffocate eggs and young PP nymphs. Adding an insecticide will increase control efficacy. There are a number of effective insecticides for PP control: any one of a number of pyrethroids (Danitol, Pounce, Ambush, Asana, Mustang Maxx*, Warrior*); or the neonicotinoids Actara or Assail. Other modes of action with PP are Agri-Flex, Agri-Mek, Beleaf, Centaur, Delegate, Exirel, Esteem, Minetco Pro, and Sivanto*. Insecticidal soap such as M-Pede or DES-X, and Surround kaolin clay are also moderately effective options for PP suppression.

Materials marked with a * are on the Maine Board of Pesticides Control PFAS list.

Treatments to control PP may need to be continued at Green Cluster and White Bud, but not during Bloom. Treatment in the first two weeks after Petal Fall is usually required to establish or maintain control. In addition to the previously mentioned materials, other options for PP control at Petal Fall include Admire, Agri-Flex, Agri-Mek, Gladiator*, Magister, Movento, Nexter, Portal, Verdepryn and Voliam Flexi. Summer applications of these materials or summer oil may also be needed as PP control can be difficult to maintain.

A home fruit tree spray mix that contains an insecticide active ingredient may be a useful alternative. Check to see if Pears are listed as a target site and that Pear Psylla is listed on the label as one of the pests controlled.

Factsheets on PP are at

<https://ecommons.cornell.edu/bitstream/handle/1813/43114/pear-psylla-FS-NYSIPM.pdf?sequence=1&isAllowed=y>

and <http://treefruit.wsu.edu/crop-protection/opm/pear-psylla/>

Another PFAS Update

This section needs its own table of contents

- 1) PFAS concern and the Maine PFAS-pesticide list are not going away anytime soon.
- 2) PFAS contamination from plastic containers.
- 3) PFAS information from EPA.
- 4) Funding for self-testing for PFAS
- 5) New PFAS positions at Maine Dept. Agriculture, Forestry and Conservation.

1) Legislative, regulatory and monitoring activity is generating media coverage which could increase public concern about use of pesticides classified as PFAS by Maine law. This issue is nowhere near being settled, and in fact is likely to be in the news for a long time. There are many steps in the EPA action plan with staggered estimated completion dates. Therefore, press releases and media coverage about PFAS are likely on multiple dates across the next 2 years at a minimum.

An issue of particular importance to Maine agriculture is whether the more inclusive Maine definition, or the less inclusive federal EPA definition, will be the criterion for identifying and regulating PFAS compounds. This is a complex topic without simple clear answers. One perspective is that each chemical is a unique entity and thus requires an individual toxicological profile. By that reasoning, categorization by shared chemical structures that may not relate to the biological activity of a compound is too coarse for meaningful distinctions. In a perfect world, the preferred scientific approach would be for testing each product because using a chemical class definition for a widely divergent population of compounds is not always accurate. But in the real world, such comprehensive testing is not possible within the resource and time constraints needed to make regulatory decisions.

Another perspective is that given the degree of uncertainty and inability to test all the compounds potentially involved, a precautionary approach calls for regulating PFAS as a chemical class. That perspective supports use of the Maine single fully fluorinated carbon PFAS definition. This perspective was stated in a 2020 scientific journal article by Kwiatkowski et al.*:

“When chemicals have similar molecular structures, environmental properties, and/or biological hazards, managing them as a class can be an effective means of reducing adverse effects on human and ecological health. While a class-based approach to chemical management can pose challenges to the traditional paradigm of individual chemical risk assessment, the extreme persistence and potential for harm from thousands of PFAS (per- and polyfluoroalkyl substances) demand a more efficient and effective approach. Examples of cases in which substances with common chemical characteristics are currently managed as a class include organophosphate pesticides, organochlorine pesticides, and organohalogen flame retardants. Thus, a class-based approach not only is feasible but also has already been implemented by regulatory agencies globally. **Here we provide scientific justification for why a class-based approach is appropriate and necessary for all PFAS, defined as chemicals with at least one aliphatic perfluorocarbon moiety.**” (Bolding added)

*Source: *Scientific Basis for Managing PFAS as a Chemical Class*. C.F. Kwiatkowski, D.Q. Andrews, L.S. Birnbaum, T.A. Bruton, J.C. DeWitt, D.R.U. Knappe, M.V. Maffini, M.F. Miller, K.E. Pelch, A. Reade, A. Soehl, X. Trier, M. Venier, C.C. Wagner, Z. Wang, and A. Blum. *Environmental Science & Technology Letters* **2020** 7 (8), 532-543. DOI: 10.1021/acs.estlett.0c00255

An April 5, 2022 article in the Guardian newspaper expresses a similar view:

“The most widely used, inclusive definition, and that proposed by the Organization for Economic Cooperation and Development (OECD), defines any chemical with one fluorinated carbon atom as a PFAS. That could include tens of thousands of chemicals on the market.

The EPA toxics office, however, wrote a “working definition” that calls for “at least two adjacent carbon atoms, where one carbon is fully fluorinated and the other is at least partially fluorinated”. It covers about 6,500 PFAS, and the EPA is using that definition in its recently introduced “national testing strategy”, which serves as a road map in its attempt to rein in PFAS pollution.”

“Cousins and other experts say a discussion over how to narrow the definition is warranted, but the toxic office’s approach is too restrictive. The EPA’s Office of Research and Development appears to have found a middle ground and is working from a definition that encompasses about 12,000 PFAS compounds. **Meanwhile, the US congresswoman Deborah Ross introduced legislation that would establish one fluorinated carbon atom as law.**” (Bolding added)

*Source: “Scientists sound alarm at US regulator’s new ‘forever chemicals’ definition”. The Guardian. April 5, 2022. <https://www.theguardian.com/environment/2022/apr/05/epa-pfas-definition-scientists-forever-chemicals>

The Maine PFAS definition was included in the previous issue of this newsletter. The two fluorinated carbon “working definition” published by EPA is highly technical. If you are a glutton for details you can read it (and if you did well in chemistry class, even understand it) at <https://www.epa.gov/pesticides/pfas-packaging#faqs>

There is no indication that the Maine single carbon PFAS definition will be rescinded or altered to match the less inclusive federal definition. To the contrary, with so much in flux, it seems equally likely that the federal EPA definition will expand to include more products and thus be more like the Maine definition. Conjecture aside, what does seem certain at this point is that PFAS will continue to be in the Maine media and a public concern in the coming months, and that there will continue to be a state-sanctioned list of pesticide products that are categorized as PFAS by Maine law.

It is not possible to predict to what degree PFAS concern will affect marketing of the 2022 tree fruit crop. Even if Maine growers avoid use of products on the PFAS-pesticide list issued by the Maine Board of Pesticides Control (BPC), fruit grown outside of Maine will continue to be grown using those products. It is important to note that both the EPA and Maine BPC continue to register those products for use on food, thus certifying an official judgement that doing so is adequately protective of human health and environment. But regardless of officially sanctioned use on food crops, negative publicity about PFAS contamination and toxicity could affect public perception of food safety. It may be difficult for those agencies to justify not taking a precautionary approach given that so much is unknown at this point. This would be especially significant if PFAS coverage in the media around harvest time generates publicity about which orchards had used pesticides on the Maine PFAS list.

2. Another PFAS issue is the potential for pesticides and other spray products that are not themselves categorized as PFAS, but which could acquire a PFAS chemical as a leachate from a PFAS treated plastic container. Such “unintentional” PFAS contamination has resulted in recall of a mosquito insecticide that was about to be used for area-wide spraying in MA. Leached PFAS contamination has been the subject of legislative discussion in Maine and at EPA.

Here is an EPA statement on this topic.

“EPA is aware that many companies are using fluorinated HDPE containers to store and distribute pesticide and other products. EPA is actively working with the Food and Drug Administration, the U.S. Department of Agriculture, and industry and trade organizations to raise awareness of this emerging issue and discuss expectations of product stewardship. For example, EPA is coordinating with the Ag Container Recycling Council, the American Chemistry Council, Crop Life America, the Household & Commercial Products Association, and the National Pest Management Association.

The Agency is also testing different brands of fluorinated containers to determine whether they contain and/or leach PFAS, and if so, learn the conditions affecting leaching. EPA will present these findings as expeditiously as possible. “

<https://www.epa.gov/pesticides/pfas-packaging>

3. These EPA pages provide background information about PFAS risk:

*** Our Current Understanding of the Human Health and Environmental Risks of PFAS**

<https://www.epa.gov/pfas/our-current-understanding-human-health-and-environmental-risks-pfas>

- A short general introduction to why PFAS is emerging as a human health and environmental concern.

*** The PFAS Strategic Roadmap: EPA's Commitments to Action 2021-2024**

Summary:

<https://www.epa.gov/pfas/pfas-strategic-roadmap-epas-commitments-action-2021-2024>

& Full document

https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf

- The roadmap demonstrates how much work remains to be done and how few of the many thousands of PFAS-group chemicals have been studied enough so far to define regulatory thresholds.

*** PFAS Explained**

<https://www.epa.gov/pfas/pfas-explained>

This page includes a remarkably broad list of “What We Don't Fully Understand Yet”:

- How to better and more efficiently detect and measure PFAS in our air, water, soil, and fish and wildlife
- How much people are exposed to PFAS
- How harmful PFAS are to people and the environment
- How to remove PFAS from drinking water
- How to manage and dispose of PFAS

4. Emergency relief fund for farmers dealing with PFAS contamination

The Maine Farmland Trust and the Maine Organic Farmers and Gardeners Association have established a fund to support PFAS related costs to Maine farms. The fund is available for all Maine farms, not just those that work with those two organizations.

The three primary purposes of the fund are:

- * To provide short-term income replacement for farms that the Department of Agriculture, Conservation and Forestry (DACF) has identified as having high test results.
- * To help pay for initial PFAS testing on farms that choose to do their own testing.
- * To support access to mental health services for impacted farmers.

For information on eligibility and application details see as

<https://www.maineFarmlandtrust.org/farm-viability/pfas-emergency-relief-fund/>

5. The Maine Dept. of Agriculture, Conservation and Forestry (DACF) is advertising three new staff positions to address PFAS issues

[Director of PFAS Response](#) (senior management position responsible for developing and directing the Department's PFAS response)

[Agricultural Compliance Officer](#) (field staff to assist impacted producers)

[Management Analyst II](#) (assist with evaluating, executing, and adapting PFAS-related programs)

Chlorpyrifos ban, Obsolete Pesticide Disposal

Lorsban and other chlorpyrifos pesticides are no longer allowed for any use on food crops. Normally when a pesticide loses its registration, leftover containers can be used up according to the label requirements. But with chlorpyrifos that is not the case, and no further use is allowed.

If you have pesticide products that are no longer useful, the Maine Board of Pesticides Control has an annual collection program in October that has operated free of charge. Details of the 2022 obsolete pesticide disposal program are not yet available, but the program is expected to be made available again this year.

https://www.maine.gov/dacf/php/pesticides/public/obsolete_pesticide_collection.shtml#:~:text=Each%20October%2C%20the%20Maine%20Board,four%20sites%20across%20the%20state

Farm Labor: H-2A & Fair Labor Standards

The University of Maine Cooperative Extension will host an online discussion on Farm Labor Guidelines on **Tuesday, April 19** and **Thursday, April 21**.

These two programs will be led by Brian Cleasby of the U.S. Dept. of Labor Wage and Hour Division (WHD). **The April 19 session will focus on H-2A program requirements.** It will cover key considerations to avoid common wage, disclosure, housing, transportation and recordkeeping-related violations at worksites where H-2A workers are employed. Links to WHD H-2A, Fair Labor Standards Act, Migrant and Seasonal Agricultural Workers Protection Act and Occupational Safety and Health Administration (OSHA) Field Sanitation compliance assistance resources will be shared during the webinar.

The April 21 session will cover the Fair Labor Standards Act (FLSA). Key topics will include avoiding common overtime, child labor and recordkeeping-related violations in agricultural settings. The presentation will cover basic compliance principles under the act, including coverage, exemptions, minimum wage, overtime, recordkeeping and child labor requirements.

A question-and-answer period will follow both presentations. More information, including dates and registration links, is available online at <https://extension.umaine.edu/agriculture/farm-labor-guidelines-virtual-discussions/>. To request a reasonable accommodation, contact Jason Lilley at (207) 781-6099, or by email at Extension.agcumberland@maine.edu.

Scouting Co-op

The Extension – Pomological Society Orchard Scouting program has two positions open. The job announcement is show below. Please share it with any good candidates.

Great Outdoor Summer Job Opportunity:

2022 UMaine Cooperative Extension Apple Orchard Scouts

The University of Maine Cooperative Extension has two full-time summer position available for apple orchard scouts. Start date is mid-May or as soon as possible thereafter. The end date is late-August. We are somewhat flexible for both start and end dates, and can also accommodate if a scout needs a couple of the regular work days off during the May-August scouting period.

No agriculture, biology or other experience is required. Pay is \$13.10/hour. Scouts must have had a driver's license for two years. The apple scout route is based at the UMaine Highmoor Farm Agricultural Research Station at 52 Route 202, Monmouth ME. However scouts can begin and end workdays at a Cooperative Extension office closer to their residence to reduce travel time to and from work. (There are offices in every Maine county).

The scouts work as a pair in a 4-day 40-hour work week. The scouts are provided with training, vehicle, and gas to travel to orchards in a weekly route through central/southern Maine between Bangor and Sanford to inspect apple trees, check traps, and collect data on apple insect and disease pests.

Scouts report observations to growers and to their supervisor by email and enter data into an Excel spreadsheet. The data are also used to produce a statewide email newsletter sent to over 500 subscribers to help apple growers make decisions regarding pest management strategies. This has been a great job for college students since 1989, with many scouts liking it so much they came back for second and third years. Many have gone onto careers in agriculture, ag support services and/or graduate degrees in biological sciences. If there is interest, the summer work could also be used as a summer internship/class credit experience.

Please contact: Glen Koehler, Assoc. Scientist IPM, Univ. Maine Coop. Extension.
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Closing Words

“An apple a day keeps the doctor away.”
~ Benjamin Franklin

“Good apple pies are a considerable part of our domestic happiness.”
~ Jane Austen

(Science-based) “...results are relevant simply because the question is often asked – and if it is not answered scientifically, it will be answered unscientifically.”
~ G. J. Oldenborgh, et al, 2021

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Putting Knowledge to Work with the People of Maine. Where brand names for chemicals are mentioned, no endorsement is implied nor is discrimination intended against products with similar ingredients. Consult pesticide product labels for rates, application instructions, and safety precautions. The label is the law. Disregard any statements in this publication if they appear to contradict label instructions. Users of pesticide products assume all associated risks. The University of Maine is an EEO/AA employer, and does not discriminate on the grounds of race, color, religion, sex, sexual orientation, transgender status, gender

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