

The Produce Pages

Serving the fruit and vegetable growers of Eastern New York



Dormancy in Tree Fruit Pruning Considerations

December 2015

BY ANNA WALLIS

With harvest wrapped up and cooler temperatures setting in, it is time for everyone to hunker down for winter, including the trees. Dormant pruning is the next big task in the orchard. But pruning at the wrong time can lead to invigoration of your trees and winter injury. Here is some information to consider before breaking out the loppers.

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The Produce Pages

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Serving the Educational and Research Needs of the Commercial Small Fruit, Vegetable and Tree Fruit Industries in Albany, Clinton, Columbia, Dutchess, Essex, Fulton, Greene, Montgomery, Orange, Putnam, Rensselaer, Saratoga, Schoharie, Schenectady, Ulster, Warren and Washington Counties

Dormancy Requirements

During the summer, foliage on the trees produced carbohydrates via photosynthesis, which was used for shoot and fruit growth. Some photosynthate was stored in woody tissue and will be used to fuel bud burst and initial vegetative growth in the spring.

At this point in the season, the trees are slowly shutting down and going into a dormant period. Dormancy is used to describe the period where trees are 'visibly inactive,' growth ceases, leaves are shed, and winter buds are formed. It is a survival strategy in which perennial plants stop growing and 'shut down' in order to withstand cold winter temperatures.

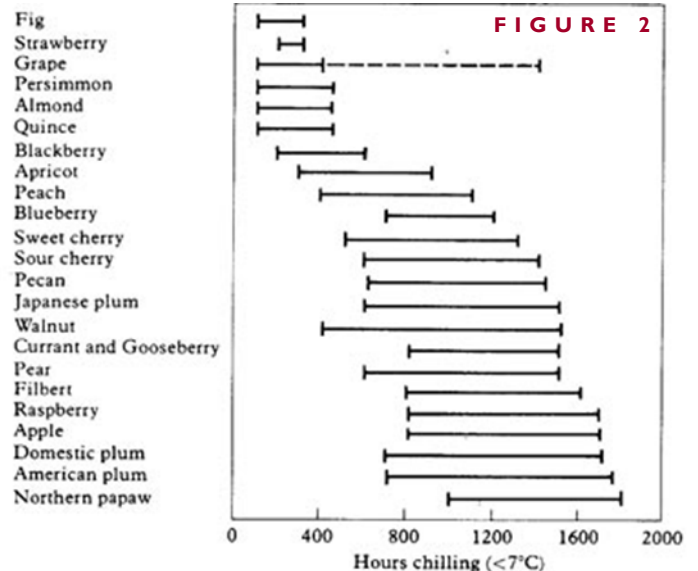
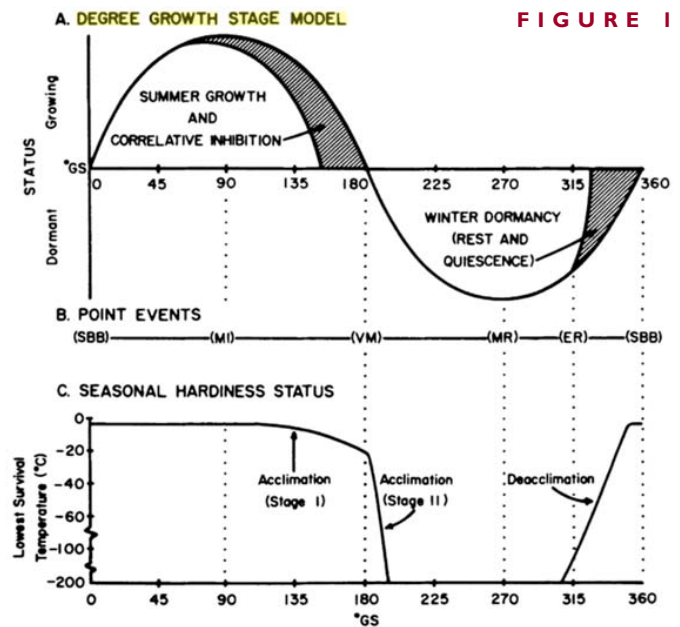
In apple trees, dormancy is controlled by temperature. This is different than some other perennials, which respond to day length as well as temperature. At the minimum, apple trees require 1-2 weeks consistently below 53°F. In a study testing dormancy requirements of various rootstocks, "Plants of cultivar 'M9' ceased growing completely [when kept] at 6, 9, and 12°C (42, 48, and 53°F) [for] 1 to 2 weeks, formed winter buds, shed their leaves and apparently went dormant."

In the orchard, dormancy requirements will be dependent on many factors, including cultivar, rootstock, tree size, and stress during the growing season. It would be safer to wait until temperatures have been consistently below 50°F for about a month, to assume trees are completely dormant.

Endo-dormancy and 'Chilling Requirements'

Like any biological process, dormancy is not black and white. It is a gradual process that involves several stages (Figure 1). The transition to complete dormancy is called **eco-dormancy** or **acclimation**. During this time, trees are 'dormant' due to unfavorable growing conditions. They will still respond to favorable growing conditions by putting out new growth in response to warmer temperatures, and buds are not completely hardy.

The term for complete dormancy, when the tree is in complete rest, is **endodormancy** or **winter dormancy**. During this period, internal physiological mechanisms prevent growth, *even if there are favorable growth conditions (i.e. temperature, moisture, and day length)*. Trees will not be able to resume growth until they have been cold for a predetermined period of time. This is called a **chilling requirement**, and is different for each species and variety (Figure 2). For example, figs require very little chilling (less than 400 hours) while apple chilling requirements range from 800 to 1650 hours. The higher the chilling requirement (number of



hours) the longer the plant will stay dormant, and the more 'hardy' it is considered.

Once the chilling requirement is satisfied, endodormancy is broken. Trees re-enter eco-dormancy, during which they will respond to environmental conditions favorable to growth. Warm spring temperatures 'wake them up,' and they begin growing again.

Pruning considerations for 2015

This year, we have experienced an exceptionally warm fall. In Peru, we experienced temperatures in the mid 50's and 60's throughout October; in the Hudson Valley, highs were in the 70's more than a few days. Therefore, trees may not yet be completely dormant. Pruning trees before they have reached endodormancy may invigorate them, preventing them from becoming

completely hardy, potentially leading to winter injury.

The best time to prune is when trees are completely dormant. This is especially true for younger plantings and smaller trees. If conditions are suitable for working outdoors, it is recommended to begin pruning in late December, and even safer in January-March of the New Year. If you decide to begin pruning in late December, start with your largest trees as these will be the most tolerant to the deleterious effects of winter injury.

Sources

Westwood, M. N. "Dormancy." *Temperate Zone Pomology: Physiology and Culture*, 3rd Edition. Portland: Timber Press, 1993. Print.

Heide, O.M. and A.K. Prestrud. "Low temperature, but not photoperiod, controls growth cessation and dormancy induction and release in apple and pear." *Tree Physiology*. 25 (2004): 109-114.



EPA Proposes Ban on Widely Used Insecticide

KEVIN BESLER

The Environmental Protection Agency (EPA) has submitted a document to the Federal Register (document number 2015-28083) that proposes to revoke all tolerances for insecticides containing chlorpyrifos as an active ingredient. A revocation of all tolerances means that any products containing chlorpyrifos would be banned from use. Note that this is a proposed rule, meaning that chlorpyrifos insecticides are still legal to use as labeled; a final ruling is not expected until December of 2016.

Chlorpyrifos is an organophosphate insecticide that inhibits the breakdown of acetylcholine, which is the chemical that motor neurons within the nervous system release in order to activate muscles. Insect pests that are exposed to chlorpyrifos are unable to breakdown acetylcholine, which leads to paralysis and, eventually, death. Chlorpyrifos-containing insecticides are used to control insects and other arthropods in warehouse and agricultural situations. In fruit and vegetable production it is commonly sold under the trade names Lorsban, Cobalt, and Vulcan and comes in a variety of formulations. These insecticides are commonly used on brassicas, onions, grapes, stone fruits, apples, and strawberries.

In the proposed rule the EPA stated that "the primary source of risk comes from chlorpyrifos and

chlorpyrifos oxon in drinking water in highly vulnerable watersheds (generally small watersheds where the land is agricultural and could be treated with chlorpyrifos (i.e., heavily cropped areas)). However, as explained in this proposed rule, some uses of chlorpyrifos do not by themselves present risks of concern from either food or drinking water and are only a concern when aggregated with all exposures to chlorpyrifos. EPA therefore invites comments that address whether some tolerances or groups of tolerances can be retained."

A full description of the proposed rule and justification can be found at www.regulations.gov by searching "chlorpyrifos" or electronically by following this [link](#). The EPA is accepting comments now through January 5, 2016. Comments can be submitted electronically through the website or mailed to: OPP Docket, Environmental Protection Agency Docket Center (EPA/DC), (28221T), 1200 Pennsylvania Ave. NW., Washington, DC 20460-0001.

Getting to Know Growers



Greetings grape growers! My name is Jim O'Connell. I am the berry and grape educator for Cornell Cooperative Extension's Eastern New York Commercial Horticulture Program, and I cover the region from Albany south to Putnam County. I know haven't had the opportunity to visit all of you yet, so in an effort to meet more of you, I am planning some traveling pot luck dinners.

Over the winter and maybe into early spring, I want to set up a series of educational dinners with you. I want to get to know you and your farms, and discuss programming needs. The first of these dinners is planned for 6pm on January 13, 2015 at Stable Gate Winery, located on 10 Linda Way in Castleton-On-Hudson, NY 12033. Valerie Feldman, owner and operator of Stable Gate Winery will be our host.

Further announcements with a signup sheet will be sent out in advance of the dinner. In the meantime, if you would like more information, and/or if you would like to host a dinner, please contact me, Jim O'Connell, via phone at 845-943-9814 or email at jmo98@cornell.edu.

Trunk Borer Management in Apples

Update

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In the article titled [‘EPA Proposes To Ban Chlorpyrifos’](#), (**Growing Produce**; posted by Christina Herrick), EPA had been requested to respond to a petition identifying Chlorpyrifos levels found in drinking water by April 15th, 2015. This concern was raised from a petition submitted by the Natural Resources Defense Council (NRDC) and Pesticide Action Network North America (PANNA). Instead of submitting a ruling, EPA proposed a timeline to allow for additional data analysis to best understand the concern. As EPA was unable to make a safety finding as required under the Federal Food, Drug, and Cosmetic Act (FFDCA), and requested a timeline extension to acquire additional data, the 9th Circuit rejected EPA’s timeline and ordered EPA to either deny the petition, issue a proposed revocation, or issue a final revocation rule by Oct. 31, 2015. EPA was required to do so and stated...“Therefore, as we are informing the court, we have **proposed** to revoke all chlorpyrifos tolerances based on the science as it stands.” Issuing a **proposed revocation** provides an opportunity for [public input prior to any final decision](#). The court also required EPA to provide the timeline for a **final rule** should EPA issue a proposed revocation by Oct. 31. EPA is notifying the court of the anticipated release of the final rule in December 2016,” the agency said.

Admittedly EPA stated that there are “not risks from exposure to chlorpyrifos in food”....“But, when those exposures are combined with estimated exposure from drinking water in certain watersheds, EPA cannot conclude that the risk from aggregate exposure meets the Federal Food, Drug, and Cosmetic

Act (FFDCA) safety standard. EPA has determined that safe levels of chlorpyrifos may be exceeded in parts of the U.S. for people whose drinking water is derived from some small vulnerable watersheds where chlorpyrifos is heavily used. If the tolerances are revoked, EPA would cancel the associated food uses of chlorpyrifos,” the agency said.

Although the situation is far from resolved, if the revocation stands, where does that leave the tree fruit industry with regards to trunk borer management? From my observations in the field this season, the borer complex has become a major threat to the tree fruit industry. Recent tree decline leading to the loss of hundreds of apple trees in Hudson Valley orchards, all on M.9 rootstock in tall spindle planting systems, point to stress induced by dogwood borer (DWB) *Synanthedon scitula* (Harris), American plum borer (APB), *Euzophera semifuneralis* (Walker), and infestations of an ambrosia beetle, the black stem borer (BSB), *Xylosandrus germanus*. When coupled with drought stress this season, these pests appear to be the primary



Borer induced tree decline and collapse, Germantown, NY 2015

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causal agents of severe tree fruit decline and death in NY. In very few incidences have we found surveyed trees to have succumbed to decline from drought stress alone.

Over the past 40 years, the use of a Lorsban directed trunk applications, using a high pressure, dilute and coarse sprays, effectively control the larva of DWB infesting rooting initials. Recent work conducted by Dr. Art Agnello (NYSAES, Geneva, NY) provides data on alternative insecticide active ingredients, suggesting effective control of DWB using Assail 30SG and Rynaxypyr WG ([APPLE EVALUATION OF VARIOUS TRUNK SPRAYS TO CONTROL BORERS INFESTING BURR-KNOTS, 2006: Agnello & Kain](#)).

From early results in managing the BSB ([Breth; 2014](#)), Lorsban has also provided the most effective level of control to reduce infestation and re-infestation from this pest in young apple on dwarfing rootstocks.

Alternative options for management of DWB would include mating disruption in blocks of 5 acres or more. The Isomate product for mating disruption of dogwood borer on apple is now labeled and available. The manufacturer is CBC (America) Corp. [Work conducted by Dave Kain and Art Agnello using this product in field trials has shown this approach to be a viable approach to DWB management.](#)

In orchards where there are active infestations, one or more directed insecticide applications will need to be made during the first season using mating disruption to bring borer larva under control. As Assail 30SG is presently labeled for DWB management in trunk applications, it would work as a Lorsban replacement based if the EPA proposal to revoke the food tolerance on Lorsban stands.

“Estimated costs of applying chlorpyrifos (Lorsban 4E) based on a plant density of 800 trees per acre, \$8 per hour for labor and a price of \$30 per gallon for Lorsban 4E, are approximately \$25 per acre. Treatment with Isomate-DWB dispensers at a rate of 150 per acre the first season, followed by 100 per acre thereafter, using the same labor rate, costs approximately \$63.60 per acre for the first season and \$42.40 per acre in subsequent seasons. Assuming that the efficacy of Isomate-DWB is equal or superior to that of Isomate-LPTB, then the ease with which pheromone dispensers are applied, the fact that no special equipment is needed and, presumably, the improved worker safety, may make the use of this product an attractive alternative for some growers” ([Kain & Agnello](#)).



Black Stem Borer Gallery Entrances

Dogwood borer1B	*Lorsban 4EC	1.5 qt/100 gal water	PB/28(A)	96	High	[17.1]
1B	*Lorsban 75WG	2 lb/100 gal water	PB/28(A)	96	High	[17.1]
4A	Assail 30SG	8 oz/acre	7	12	Moderate	[17.2]

2015 Cornell Pest Management Guidelines for Tree Fruit Production

* Restricted Use Pesticide

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Broad Mites on Blackberries

WRITTEN BY K. DEMCHAK,

PENN STATE UNIVERSITY AND D. JOHNSON,
U. OF ARKANSAS

SOURCE: PENN STATE EXTENSION NEWS,
10/29/15

Editors' Note: Broad mites have been seen for years on greenhouse crops, but lately have become problems on field peppers in eastern NY. A close relative, cyclamen mite, are a problem in June bearing strawberries. We have yet to see them in blackberries, but this article helps us understand that there is a progression and that we should be looking for them.

Broad mite (*Polyphagotarsonemus latus*) has been a pest of tropical, subtropical and greenhouse crops for over a century, and has been problematic for pepper growers in PA and for the last couple of years. Now we can add blackberries to the list of crops that they frequent.

In PA, we first found broad mites on blackberries in 2013. In 2015, we found that they can contribute to a nearly total crop loss on primocane-fruiting blackberries. On these plants, bacterial issues are part of the problem with

symptoms similar to those from fire blight (tissue browning and death) present. At this point, we don't know whether the two issues just happen to be present at the same time, whether injury by the mites may be contributing to tissue susceptibility to bacterial infection, or whether other interactions are coming into play. In Arkansas and North Carolina, researchers began experiencing problems with broad mites on primocane-fruiting blackberries in 2006 and a commercial grower has had problems since 2014.

Typical damage from broad mites is tissue distortion, reduced terminal leaf growth, either downward or upward curling or cupping of leaves (Photo 1) and flower clusters that appear compressed (Photo 2) or blossoms that dry up. Symp-



Photo 2: Infested blackberry terminal growth showing upward leaf cupping and compression of flower cluster.
Photo credit: Kathy Demchak, Penn State Univ.



Photo 1: Leaf distortion and cupping of blackberry leaves infested by broad mites.

Photo credit: Donn Johnson, Univ. of Arkansas



Photo 3: Greatly-magnified young blackberry fruit with broad mite female (right) and eggs (left of center).

Photo credit: Sara May, Penn State Univ.

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Photo 4: Terminal dieback of blackberry plant resulting from broad mite infestation.

Photo credit: Donn Johnson, Univ. of Arkansas



Photo 5: Young blackberry fruit with numerous broad mite eggs and adults.

Photo credit: Tim Gleason, Penn State Univ.

toms on flower clusters may not show up until the second year of infestation. Broad mites build up to hundreds per leaflet on younger terminal leaves. These mites are very tiny - less than 0.2 mm (about 1/100th of an inch) as are their distinctive eggs dotted with white spots (Photo 3). These mites are difficult to see even with a 16X hand lens.

Because of the small sizes of broad mites and the eggs, symptoms of leaf curling and dying terminal foliage (Photo 4) and flower clusters are all that a grower is likely to notice.

With citrus, the mites are found in depressions on the fruit where the females lay their eggs, and as is evidenced by the number of mites and eggs on a young blackberry fruit (Photo 5), it appears that blackberries provide a similarly desirable fruit surface.

At this point, we mainly want to make growers aware of this potential problem in case they have seen similar symptoms (either terminal leaf and flower distortion or symptoms similar to fire blight), especially if they are growing primocane-fruited blackberries in the field or high tunnels. We're not sure exactly why we are seeing this new mite pest on blackberry at this time or where it came from. Perhaps this pest is better able to sur-

vive in more mild winter temperatures, both in the field and in high tunnels.

In both instances where broad mites were problematic in PA, the blackberries were grown in high tunnels, but they are ones from which the covers are removed for the winter. Since the tunnel climate is generally conducive to increased mite populations, their numbers may have increased, regardless of whether the cover was removed for the winter or not. Interestingly, there is some evidence that they may be able to gain mobility by attaching themselves to whiteflies.

So, what can one do to control broad mite infestations? First, keep watch for them, and if you notice just a plant or two exhibiting suspicious symptoms, rogue it out along with a couple of plants to each side of it. It appears that it is possible to hold the problem at bay, or slow it down greatly by utilizing this simple practice. Practices similar to those that would assist with controlling two-spotted mites (conserving natural enemies, releasing predatory mites early enough and at timings that would allow them to establish in the planting, and avoiding use of broad-spectrum insecticides) may be beneficial, though there is currently very little information in this area.

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Few miticides are labeled for use on blackberries at this time, resistance development is a huge concern, and efficacy data is somewhat limited, so we will need to do some work before making recommendations on miticide usage. Stay tuned for more news on this front.

Acknowledgement: Thanks to Sara May at [Penn State's Plant Disease Clinic](#) for assistance in diagnosing this problem in Pennsylvania.

Additional Reading/References:

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Johnson, D. 2015. [Do You Have Broad Mites on Blackberry? Arkansas Fruit and Nut News, Vol. 5, Issue 5, June 8, 2015.](#)

Myers, M. and Bogash, S. 2015. [Broad Mites in Fruiting Vegetables. Penn State Extension, posted June 22, 2015.](#)

[University of California IPM Pest Management Guidelines: Citrus, Broad Mite.](#) Updated 2015. UC ANR Publication 3441.

FSMA Final Rule

ERIK SCHELLENBERG

The Food Safety Modernization Act is now in the Federal Register, and will go into effect in the next 60 days. The first thing to know about it is that even non-exempt farms don't have to comply immediately. The soonest that any farm needs to be in compliance with the Produce Rule is two years from now. That is for farms that gross over \$500,000 or otherwise do not qualify for a conditional exemption. Farms making between \$250,000 and \$500,000 will have three years, and farms making between \$25,000 and \$250,000 will have four years. All income brackets will have an additional two years to comply with certain requirements pertaining to the use of agricultural water.

The Produce Rule is 801 pages long, so you can imagine that it will take some time for Cornell Extension to digest it and deliver the key points in a summarized form so farms can begin the work needed to comply with the Rule. We will begin offering the required FSMA one day food safety training course in January 2016. We have been preparing for this along with the Produce Safety Alliance for quite a while, and the curriculum of the course is already finalized and two train-the-trainer courses have been given. There will be many options to get the required training, as the FDA will approve other curriculums and other organizations will also be offering approved certificate trainings.

The food safety certificate will cover the basics of on farm food safety, and the requirements of the law with an eye towards the similarities and differences between FSMA and GAPS. It is important to know that GAPS certification does not exempt you from attending the FSMA food safety certificate training. If you already have a GAPS certificate, this may be an opportunity to send a different employee from the farm so that more of the farm management knows the ropes about food safety, and they can bring back the information regarding any additional work that must be done to comply with FSMA.

Dates and times for the courses have yet to be determined, as we will be coordinating state-wide to offer the best coverage. Stay tuned for food safety news because there may be significant changes that you need to make on your farms to comply with FSMA. We will be providing all the necessary educational materials and question answering to make sure that you can comply with the Rule within the time frames listed above.

Visit the ENYCHP Website

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Email or call any of the educators with questions or comments on the website – we want to make it work for YOU!

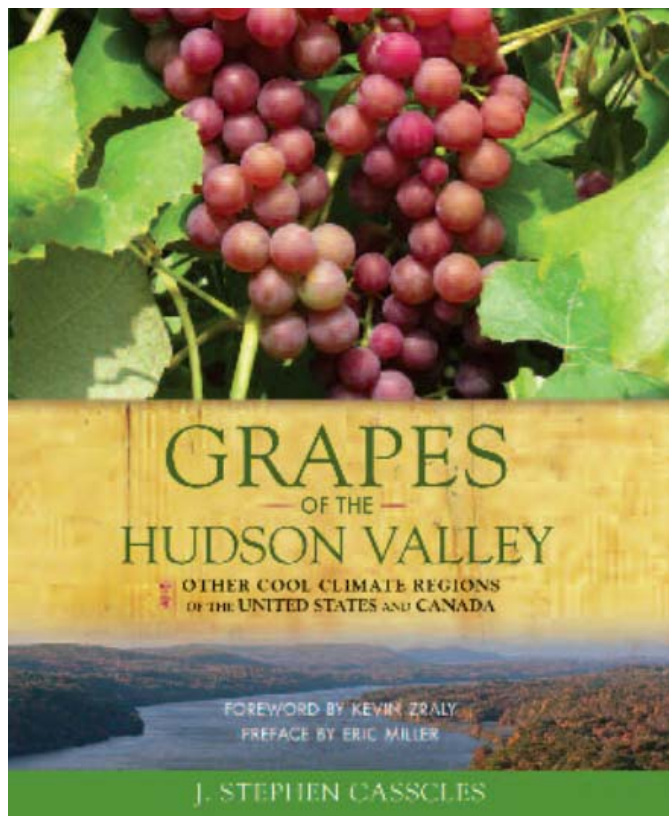
Winter Blankets Keep Grapes Warm

JIM O'CONNELL

Winter blankets aren't just for people to bundle up with next to the fire place anymore. Now grape growers are using them to protect sensitive varieties from winter injury. While the blankets people use to stay warm during the winter are often cotton or wool blends with colorful patterns, these blankets are constructed of a white non-woven polyester fabric and are called frost blankets.

Similar to floating row covers used in strawberry production, these frost blankets work by trapping heat and maintaining a warmer temperature under cover than the surrounding ambient air temperature. Previous research done in Quebec, Canada reported success with these blankets, maintaining temperatures at 0F or above.

This fall/winter, I am doing some preliminary work at a newly planted vineyard in Dutchess County. The frost blankets will be tested on two *vitis vinifera* cultivars: Merlot and Chardonnay. Ambient air temperatures and temperatures under the frost blankets will be recorded using ibutton data loggers. As a comparison to the frost blankets, some rows of vinifera will be buried under wood chips and will be similarly monitored for temperatures. Because the vines are so young, bud mortality will not be collected. Final preliminary results will be reported in the seasonal ENYCHP grape newsletter.



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September 2015

To Buy or Not to Buy: Influencing Customers throughout the Consumer Decision Making Process

DEBRA WOOD PEROSIO

CHARLES H. DYSON SCHOOL OF APPLIED
ECONOMICS AND MANAGEMENT

CORNELL UNIVERSITY

Have you ever walked down the street and smelled a burger being charcoal grilled? Or how about when you are in a supermarket and you smell bread baking? All of a sudden the cravings start, and before you know it, a fresh loaf of bread is in your shopping cart! How do these aromas create such a strong urge when just a few minutes earlier you had no intention of purchasing fresh bread?

Consumer behavior is a discipline that helps to explain why people buy what they buy. It is important for marketers to understand consumer behavior, so they can influence their target market throughout the consumer decision making process. Specific examples of strategies a marketer might consider to influence a customer's purchase decision are outlined below.

The diagram below illustrates the consumer buying process.

Problem recognition

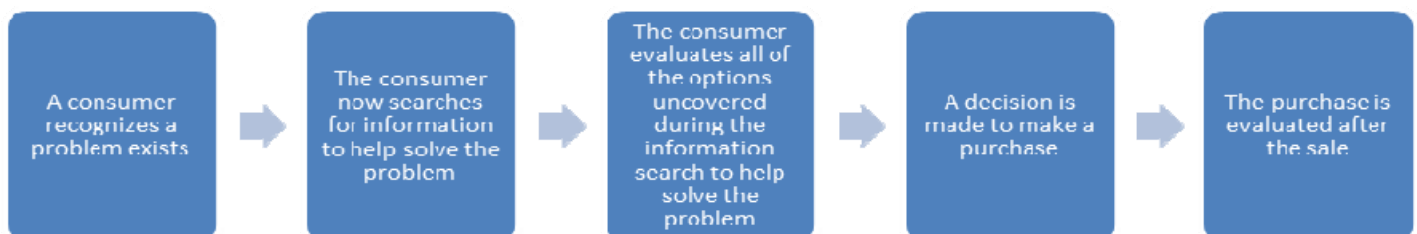
A problem is recognized when a consumer experiences an imbalance between their present and preferred state. Typically some type of stimulus triggers this imbalance...maybe that chargrilled smell or an advertisement for a new restaurant. Certainly a frozen computer or a knee injury can create a problem that begs for immediate attention. Many "imbalances" are created by marketers through their promotional efforts and can occur at every step in the consumer decision making process.

Strategies for marketers to consider: Creating an Imbalance

- Create irresistible aromas
- Position a product to make it cool...create an image so that consumers think they can't live without it...Apple does a great job with this!
- Focus your discussion around safety...think about ADT ads and Life Alert Ads
- "Health" is an excellent focus area of promotional efforts....products that promote better health are popular with consumers today
- Appeal to consumers' sense of self, lifestyle and their aspirations. Kashi does a great job of appealing to consumers who see themselves as healthy people who love adventure and the outdoors

Information search

Depending on the magnitude of the imbalance a consumer may need to initiate an *information search*. Following the aroma of the burger down the street is a simple search while fixing a computer, seeking medical advice or learning more about the Apple Watch suggests a more complex time intensive information search is warranted.



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Information searches are more complex and lengthy when the consequences of the purchase hold great importance to the consumer. If the burger you are chasing down doesn't turn out to be delicious, it's no big deal; however, if the doctor you select for your knee injury is less than competent, the consequences can be serious.

Very simple information searches are done "internally." You think about which restaurants are in the area, make a decision, and you're done. Other, more complex searches require an "external" information search utilizing websites, brochures, advertisements, magazines, etc. to provide the information necessary to make an informed decision. These external information sources are where marketers can influence their target market.

Strategies for marketers to consider: Influencing the information search

- Make sure information about your business is "everywhere" that consumers are and on every "screen." If a consumer needs information about a new computer or an orthopedic surgeon, the information should be easily available and available in many forms. Too many clicks, a webpage that will not load, or no website at all will deter potential customers. If you are promoting a restaurant, make sure the menu is easy to access on mobile devices, computers and tablets.
- If you have a small local business, post flyers in public places like the post office or grocery store. Put the flyers where your customers will be!
- Don't be afraid to advertise the "old fashion way" with print ads, flyers, brochures and tear-off sheets. Depending on your target audience and the type of product or service offered, a flyer may be more effective than a complex social media campaign or an expensive ad in a local newspaper.

Evaluate Alternatives

As the information search evolves, a list of alternatives is generated. Sometimes the list is short and simple...I'll follow the smell to the burger, while other times it is longer and more complex. As con-

sumers sift through alternatives they tend to rank order them; those with the attributes that are most important rise to the top of the list.

Strategies for marketers to consider: Influencing customer rankings

- It is critical that consumers understand what makes your product or service unique. Whatever that unique feature is should be the focal point of all promotional efforts. Think about Volvo (safety), Wal-Mart (price), Wegmans (fresh). The stronger the positioning, the better chance that your target market will recognize your product and place it at the top of the list!

Purchase

After an imbalance has been created, an information search conducted, and the alternatives have been evaluated, a purchase decision follows.

Strategies for marketers to consider: Closing the sale

- One of the most effective ways to "close the sale" is by offering some type of promotion or discount that entices consumers to take the plunge. For many, everyday consumer products or low risk/low price purchases, a discount or incentive will convert a consumer's interest into a purchase.
- For more complex, high risk/high price purchases, personal interaction with the consumer is important to help close the deal. A pleasant conversation with the administrator setting up your appointment with an orthopedic surgeon may help a consumer feel comfortable with their choice.

Post Purchase Evaluation

Did you ever get a product home and wonder what were you thinking when you purchased it? Buyer's remorse is not uncommon particularly when dealing with more costly purchases.

Strategies for marketers to consider: Minimizing buyer's remorse

- The best way to keep your customers happy even after the sale is with follow-up post-

Continued on next page

purchase actions, especially for more costly/risky purchases. A phone call, email, or letter works great.

- Keep customers involved with the company after the purchase with social media...entice them to "like" or "follow" you on Facebook or twitter.
- Offer incentives on future purchases.

There are many places throughout the consumer decision making process that marketers can intervene and "nudge" people toward their products or services. This should be an all-out effort with a strategic plan in place that influences customers during each step of the consumer decision making process. Hopefully with a great plan in place, more sales will be closed!

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"Smart Marketing" is a marketing newsletter for extension publication in local newsletters. Past articles are available at <http://agribusiness.dyson.cornell.edu/SmartMarketing/index.html>.

ENY COMMERCIAL HORTICULTURE UPCOMING WINTER LOCAL PROGRAMS

February 15, 2016.

Northeast NY Tree Fruit School.
Lake George, NY.

February 16-17, 2016.

**Hudson Valley Fruit School –
Tree Fruit Sessions.**

February 18, 2016.

**Hudson Valley Fruit School – Berry and
Grape session.**

New Dates Added Regularly at:

<http://enych.cce.cornell.edu/>



Carrot Variety Trial Summary - 2015

CRYSTAL STEWART

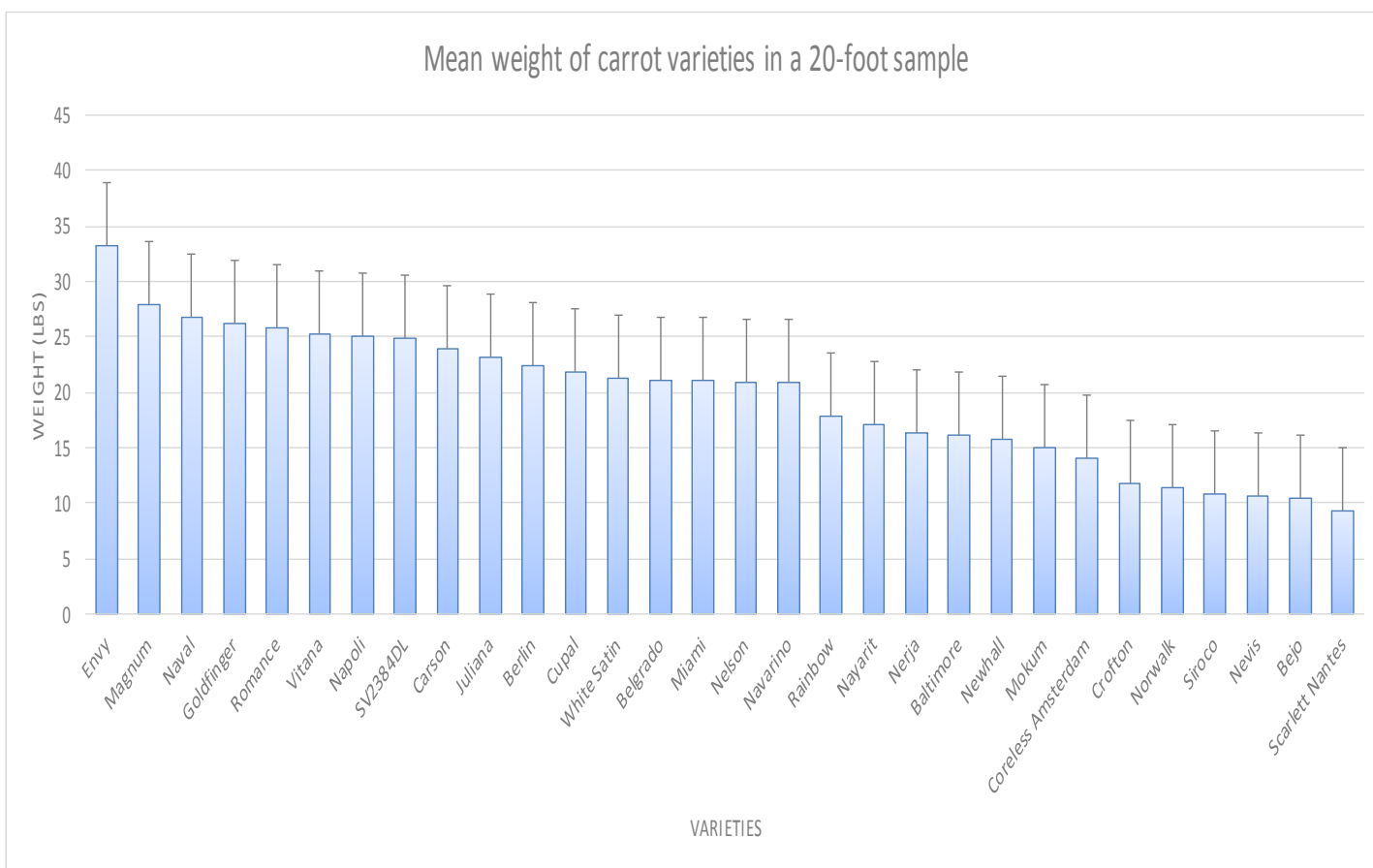
Key conclusions: There are significant differences in yield, quality and marketability of commercially available carrots, with some of the newer varieties providing clear improvements over old standards.

Introduction: Fresh market growers in Eastern New York have been asking for an evaluation of available carrot varieties for many years, in part due to an increase in foliar disease problems on many farms and in part due to demand for the next high yielding, high quality root. An assessment of 31 currently available varieties helped to start answering this question, while also leading to additional questions about how to grow a better carrot on a variety of soil types.

Background: The carrot variety trial was planted at the Hudson Valley Farm Hub in Hurley, NY on June 26th. The trial was planted with non-pelletized seed using an Olimpia Gaspardo vacuum precision planter at a rate of 30 seeds per foot in a two-inch band. The trial was grown organically, with optimum fertility and fairly good weed control. Carrots were harvested on September 25th. Three, twenty-foot samples of each variety were used for evaluation.

Results: The carrots varied dramatically in their yield, with some of the new varieties leading the field and some older varieties having the lowest yields. This information is shown graphically below, with error bars indicating which carrots are statistically different from each other. If a graph line (blue) does not overlap with the error bars around it, the carrot yields are statistically different. Bars which overlap are numerically but not statistically different.

Continued on next page



In addition to total yield, we also measured the percent of each variety that was marketable, and extrapolated yields too 100-foot and one-acre. These extrapolations are based on the yield picked from the three twenty foot sections. Table One shows these numbers, with varieties ranked from highest marketable yield to lowest.

There were also many qualitative differences between the varieties, including notable differences in *Alternaria* susceptibility of the foliage. The best tops included some of the top yielding varieties such as Envy, Magnum, Naval, and Goldfinger (figure 1). Older standards such as Scarlet Nantes, Coreless Amsterdam, and Mokum did not fare as well with *Alternaria* resistance or yield, nor did some new arrivals such as Sirocco or Nevis. Taste is of course a key when considering varieties, and growers rated this quality during a twilight meeting where we looked at the trial. The favored

variety was Baltimore, with Envy and Juliana also being favorites.

Another quality which was evaluated carefully during this trial was susceptibility to cracking. This plot was not irrigated, and precipitation was quite variable during this growing season. After about a month of dry weather, we received a saturating rainfall. These conditions are not ideal for growing carrots but are ideal for showing which varieties will hold up during challenging conditions. Some of the same favorites rose to the top, while varieties such as Scarlet Nantes, Belgrado (a processing carrot), and Juliana had significant culls due to cracking (Figure 2). Notably this is an issue which might be resolved by careful irrigation management.

Continued on next page

Table One: Varieties ranked by marketable yield

Variety	% Marketable	Total yield (lb) in 60'	Yield/100'	Yield per acre at 17200 row feet/acre
Envy	78%	99.7	166	28,566
Cupal	78%	65.7	110	18,834
Goldfinger	78%	78.7	131	22,561
Carson	75%	71.9	120	20,611
Vitana	74%	76.0	127	21,787
Nelson	73%	56.6	94	16,225
Romance	73%	77.5	129	22,217
Navarino	72%	62.7	105	17,974
Miami	71%	63.4	106	18,175
Nelson	70%	69.1	115	19,809
Magnum	70%	83.5	139	23,937
Baltimore	69%	48.7	81	13,946
Crofton	67%	35.3	59	10,119
Rainbow	66%	53.6	89	15,365
Berlin	66%	67.1	112	19,235
Naval	66%	80.3	134	23,019
Norwalk	65%	34.4	57	9,861
Belgrado	64%	80.1	133	22,948
SV2384DL	62%	74.7	125	21,417
Napoli	62%	75.3	125	21,572
Ingot	60%	69.7	116	19,981
Mokum	60%	44.9	75	12,871
Siroco	59%	32.4	54	9,288
Nerja	59%	48.7	81	13,961
Bejo 2976	58%	31.4	52	9,001
Juliana	57%	69.6	116	19,938
White Satin	55%	63.6	106	18,232
Newhall	52%	47.0	78	13,473
Nayarit	50%	51.1	85	14,649
Nevis	48%	32.0	53	9,173
Coreless Amsterdam	44%	41.9	70	12,011
Scarlett Nantes	39%	27.8	46	7,969



Figure 1: Varieties with good tops.
Images: Anne Bloomfield, HVFH

Continued on next page

Figure 2: Carrot varieties showing susceptibility to cracking.

Images: Anne Bloomfield, HVFH



Conclusions: Newer varieties such as Envy, Magnum, Naval, and Goldfinger show promise in replacing older varieties such as Coreless Amsterdam, Mokum, and Scarlet Nantes. Careful selection from available new varieties can yield carrots which are smooth, straight, good-tasting, and have quality tops. As with any trial, growers should remember that varieties could respond very differently on their soils and in their microclimate. We always recommend doing your own trialing to compare current varieties to new ones in each unique system.

In order to see pictures of each of the varieties grown in this trial, visit our website at <http://enych.cce.cornell.edu/> and click on the carrots tab. If you have specific questions, please email Crystal at cls263@cornell.edu or call 518.775.0018.

Additional research questions: This trial created a broad base from which to evaluate a variety of fresh-market carrot varieties of both Imperator and Nantes lineage. Another year of trial data will help determine if the results observed this year were typical for each variety. Additionally, replicating the trial with irrigation will also provide useful information about how each variety performs under ideal conditions.

The question of how ridge cultivation affects deep-rooted crops still remains following this trial. Comparing flat ground, raised-bed and ridge cultivation for germination rates, marketable yield, and overall quality is another avenue for future research.

This research was funded in part through a grant from the New World Foundation. Many thanks for the support of the Farm Hub crew for maintaining the research plots and assisting with





Farm Food Safety Training with GAPs

A Produce Safety Workshop

DECEMBER 14 - 15

8:30 AM – 4PM

CCE ORANGE COUNTY

18 SEWARD AVENUE, MIDDLETOWN, NY, 10940

Co-sponsored by: Cornell Cooperative Extension Orange and Ulster Counties, Cornell University - The National GAPs Program & The Produce Safety Alliance, and The Local Economies Project of The New World Foundation.

Goals of this workshop:

- Understand how GAPs (Good Agricultural Practices) impact produce safety on your farm
- Learn what is needed to participate in a 3rd party audit
- Begin writing a farm food safety plan to implement practices

Day 1: Agenda

- ⇒ 8:30 am **Registration, Refreshments, Welcome and Introductions, introduction to Local Economies Project**
- ⇒ 8:45 am **Food Safety Begins on the Farm: Review of Produce Safety Issues & Market Implications**
- ⇒ 9:30 am **Introduction to Buyer Requirements, 3rd Party Audits, and Regulations**
- ⇒ 9:50 am **Break**
- ⇒ 10:10 am **USDA GAPs Audits: An Overview , NYSDAM**
- ⇒ 11:10 am **GAPs: Recordkeeping and Worker Training**
- ⇒ 11:40 am **GAPs: Traceability & Transportation**
- ⇒ 12:15 pm **Lunch**
- ⇒ 1:00 pm **GAPs: Production Water Management**
- ⇒ 1:45 pm **GAPs: Postharvest Water Use & Packinghouse Sanitation**
- ⇒ 2:30 pm **Break**
- ⇒ 2:45 pm **GAPs: Manure, Compost, and Wildlife Management**
- ⇒ 3:05 pm **Regulatory Updates: FSMA & The Proposed Produce Rule**
- ⇒ 3:30 pm **Developing a Farm Food Safety Plan**

⇒ 3:45 pm **What to Expect in Day 2, What to Bring, Bag of Resources, and Evaluations**

⇒ 4:00 pm **Adjourn**

Day 2 Agenda: Writing Your Own Farm Food Safety Plan

⇒ 8:30 am **Computer set up and check of software**

⇒ 9:00 am **Walk through of USB drive materials**

⇒ 9:30 am **Begin working on individual farm food safety plans**

⇒ 10:00 am **Continue working on your own farm food safety plan (Breaks as needed)**

⇒ 11:30 am **Discussion: How is it going? (Time as long as needed)**

⇒ Noon **Lunch**

⇒ 12:45 pm **Continue working on your own farm food safety plan (Breaks as needed)**

⇒ 2:30 pm **Reach a stopping point on your plan**

⇒ 2:45 pm **Wrap up and Course Evaluation**

⇒ 3:00 pm **Adjourn**

Bring the following items with you on day 2 of the workshop

- Laptop computer unless you reserved one of ours in advance
- A list of crops you want to be certified in (if planning to participate in an audit)
- Farm maps with fields outlined
- If you have a packinghouse, bring a packinghouse floor plan that shows product flow from the time it enters the packinghouse until it leaves. Can be hand drawn and simple.
- A list of services you have contracted. This may include pest control, portable toilet rental/servicing, trucking/transportation, etc. and any recordkeeping documents they supply.
- Lots of questions!

Participants will be provided with:

- A flash drive pre-loaded with templates to use in writing your own farm food safety plan including templates of recordkeeping forms
- Bag of Resources: Farm Worker Training CD, A Grower Self Assessment for Food Safety Risks, Posters, Magnets, Coloring Book, and Photonovellas

Sign Up for this GAPs training

Contact Erik Schellenberg at jk2642@cornell.edu or call 845-344-1234

Calendar of Events

December 8-10, 2015. *Great Lakes Fruit, Vegetable, and Farm Market EXPO and Michigan Greenhouse Growers Expo.*

<http://www.glexpo.com/#>

December 15-17, 2015. *New England Vegetable and Fruit Conference.*

<http://www.newenglandvfc.org/>

January 7-9, 2016. *North American Strawberry Growers Conference*, Savannah, Georgia. Held in conjunction with the Southeast Regional Fruit and Vegetable Conference.

<http://www.seregionalconference.com/>

January 19-21, 2016. *Empire State Producers EXPO*. Syracuse, NY.

<http://nysvga.org/expoinformation/>

February 2-4, 2016. *Mid-Atlantic Fruit and Vegetable Convention*, Hershey, PA.

<http://www.mafvc.org/>

February 9-11, 2016. *NJ Agricultural Convention and Trade Show*, Atlantic City, NJ.

<http://www.njveggies.org/convention>

March 2-4, 2016. *North American Raspberry and Blackberry Conference*, Colonial Williamsburg in Williamsburg, VA.

<http://www.raspberrylblackberry.com/>

2016 Enrollment for ENYCHP Commences in December!

The Cornell Cooperative Extension Eastern NY Commercial Horticulture Program (ENYCHP) covers 17 counties in eastern NY (Albany, Clinton, Columbia, Dutchess, Essex, Fulton, Greene, Montgomery, Orange, Putnam, Rensselaer, Saratoga, Schoharie, Schenectady, Ulster, Warren and Washington Counties). The ENYCHP consists of 13 specialists that provide research and educational information to the growers and others involved in the tree fruit, small fruit, vegetable and grape industries. The specialists work closely with Cornell University faculty and other industry staff to provide growers with the most up to date production, marketing and pest management information in the region.

You are invited to enroll in the ENYCH Program for 2016. The cost to enroll is \$100 for 1 year (tax deductible business expense) and coincides with the new calendar year starting January 1. Below are a few of the benefits you will receive for your \$100 enrollment in the ENYCHP:

- 1 free Cornell University Commercial Integrated Pest Management Guidelines
- Your choice of 4 seasonal newsletters
- The Produce Pages—the ENYCHP winter newsletter publication
- Access to cutting edge research and Extension Educators with experience and expertise in their field
- Local and regional meeting announcements
- Discounted event registration for enrolled ENYCHP members (when applicable)
- NYS DEC pesticide applicator and special permit trainings offered
- Special, timely alerts on important pests outbreaks in the area

Look for enrollment forms in the mail and through your email. On-line enrollment will be available in early December.

Orange County participants should enroll through their CCE at: https://s3.amazonaws.com/assets.cce.cornell.edu/attachments/11754/Ag_enrollment_2015_legal.pdf?1447185740

Thank you for your support!

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The Cooperative Extension Association
of Rensselaer County
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61 State Street, Troy, NY 12180

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AGRICULTURAL & FOOD BUSINESS OUTLOOK CONFERENCE

WEDNESDAY, JANUARY 20, 2016

B25 WARREN HALL, CORNELL UNIVERSITY CAMPUS, ITHACA, NY

New York agricultural leaders learn about the short-and long-term outlook for agriculture and agricultural products. Breakout sessions concentrate on dairy, grains and feed, and horticultural products. By attending, you will:

- Better understand critical issues facing agriculture in New York and the Northeast
- Learn about the near-term outlook for major New York commodities
- Interact with fellow leaders of the vibrant New York agricultural industry

Registration:

\$65 by January 4, 2016. (Registrations after January 4 will be \$80.) . Parking Permit (required for on-campus parking) additional \$10. Registration and more information can be seen / is being added at:

<http://dyson.cornell.edu/outlook/economic-outlook-conference>

Questions or to register by phone: Contact Gretchen Gilbert, gcg4@cornell.edu, 607-254-1281

The registration fee includes morning refreshments and lunch. (Lunch location TBD.) Other dining options on campus are available, at your own expense.

<http://www.campuslife.cornell.edu/campuslife/dining/eateries.cfm>

Cornell Cooperative Extension and the staff assume no liability for the effectiveness of results of any chemicals for pesticide use. No endorsement of any product is made or implied. Every effort has been made to provide correct, complete, and current pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly and human errors are still possible. These recommendations are not substitutes for pesticide labeling. Please read the label before applying any pesticide. Where trade names are used, no discrimination is intended and no endorsement is implied by Cornell Cooperative Extension.

Diversity and Inclusion are a part of Cornell University's heritage. We are a recognized employer and educator valuing AA/EEO, Protected Veterans, and Individuals with Disabilities.