



Home, Yard, and Garden Pest Newsletter

Issue 2 • May 5, 2021

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Phenology and Insect Management

Have you ever heard sayings such as “plant corn when oak leaves are the size of squirrels ear” or “apply crabgrass preventer when forsythia are blooming”? Sounds like old folk-lore but actually there is a science behind these statements. Phenology is the study of periodic plant and animal life cycle events and how they relate to seasonal/environmental changes. Rather than planning annual gardening tasks solely by the calendar, scientists have found correlations between temperatures and certain events by observing such things as bird migration, plant budding, flowering and fruiting and insect activities. American Indians observed nature and determined that soil was warm enough to prevent corn seeds from rotting at the same time oak leaves were emerging in the spring. Unknowingly they were using a phenological indicator. Oak leaves were a visual cue that told them it’s time to plant corn.

Horticulture uses plant development to predict insect-pest activity. This is very useful as part of an integrated pest management (IPM) program

because it helps to properly time pesticide controls to target the most susceptible life stage of a pest. Insects are cold blooded and their growth and development is directly aligned with weather conditions, particularly temperature. Plants and insects are likely to be similarly affected by cloud cover, rainfall, and the number of hours at various temperatures. The observation of visual cues such as plant bud break and bloom time, lets us know when certain pests are likely to be present and in a vulnerable stage to control. Pest populations vary from year to year so scout the pest-prone plant to make sure the insect is present. Once identified, correct pesticide applications should result in a high percentage of control with the least amount of chemical compared to the calendar method that does not take into account seasonal temperatures.



Spiraea x vanhouttei in bloom

We know that insects emerge earlier in warm years than in cool years – but how to predict? Scientists monitor growing degree-days. This is a measure of the amount of heat that accumulates over a specified base temperature during a 24-hour period. A base line temperature of 50°F has been commonly agreed upon for landscape/turf calculating the development of insect pests in landscape/turf. One degree-day accumulates for each degree the average temperature remains above 50° over those 24 hours. In a 24-hour period sever-

al degree-days can accumulate. If the temperature does not rise above 50 in that 24 hour period, no degree-days are reported.

There are several ways to calculate the number of degree-days but the easiest is the Average Method. Simply add the daily maximum and minimum temperatures and divide the sum by two to get the average temperature for the day. Subtract the base temperature (50) to get the number of degree-days for that 24-hour period. If the result is 5 degree-days, add them to the running total for that season. If the result is a negative number don't add to the accumulated number.

The Illinois Water Survey keeps track of growing degree-day reports from across the state. You can select a base temperature of either 40 or 50 degrees F. Although most insects do not develop at temperatures below 50 degrees F, many plants start developing at 40 degrees F. Generally, the number of days when high temperatures hover in the 40's degrees F is similar from spring to spring, so plant phenology works to predict insect development. Occasionally, there are extended periods of high temperatures in the 40's degrees F, resulting in plant phenology being less precise in predicting insect development. This is one reason for scouting before treating when using any of these methods.

The green-industry has phenological indicators for some of our insect pests. For example newly hatched Eastern tent caterpillars appear at the same number of degree-days when Saucer Magnolia (*Magnolia x soulangiana*) is in pink bud to early bloom. Bridal Wreath spirea or Vanhouttei spirea (*Spiraea x vanhoutteii*) is an indicator for various pest life stages from blooming through finished bloom.

Euonymous scale is a real problem to control since this pest protects itself with a hard outer shell. It has piercing/sucking mouthparts so it removes plant liquids while completely protected from chemical contact sprays. But there is a time in its lifecycle when it is not protected. This is when the eggs hatch and the crawler stage is present. The crawlers are spreading out to find a spot where they can anchor in and form their armored coat. They are very small and often go unnoticed. The visual cue is when Northern catalpa (*Catalpa speciosa*) is in early bloom. Never assume they are there, verify that the crawlers are present before applying a chemical control. The most vulnerable stage of bagworm is present when Northern

catalpa is in full bloom.

Crabgrass seeds germinate when the soil temperatures are above 55°F for 7 - 10 days. Frequently, the soil has warmed to this temperature when we have had the correct number of degree-days for forsythia to bloom. Don't apply every year on April 15 – when forsythia blooms, check soil temperature data to verify that the timing is right.

This article was authored by Martha Smith and Phil Nixon. It was originally published on April 22, 2013.

Republished by Travis Cleveland - tclevela@illinois.edu

Boxwood Leafminer

Boxwood leafminer (*Monarthropalpus flavus*) is a tiny midge that can harm boxwoods in its larval stage. The adults emerge in the spring around the time weigela is in bloom. Females lay eggs under the surface of a leaf and larvae feed on the tissue within the leaf.



Boxwood leafminer (Monarthropalpus flavus) larvae in open leaf cells, Jim Baker, North Carolina State University, Bugwood.org



Boxwood leafminer (Monarthropalpus flavus) leaf discoloration, Penn State Department of Plant Pathology & Environmental Microbiology Archives, Penn State University, Bugwood.org

Larval feeding causes a raised green blister that can be seen on the leaf's surface. The blister may become discolored or flake off later in the season. The leafminers overwinter within the leaves as larvae. They have one generation per year in Illinois.

Boxwood leafminers can cause leaf discoloration, blistering and early leaf drop. In heavy infestations, twigs may begin to dieback. Most varieties of boxwood are susceptible to boxwood leafminers.

Contact insecticide can be applied when adults are actively laying eggs. Adult emergence and egg laying coincides with weigela blooming (GDD base 50: 400-600). Contact insecticides targeting adults include, carbaryl (Sevin), abamectin (Avid), acephate (Orthene) and pyrethroids labeled for use on boxwood leafminer. Imidicloprid (Merit or others) can be applied to target feeding larvae but must be applied after blooming is complete.

Sarah Hughson - hughson2@illinois.edu

Getting to Know Common Wasps

Throughout the summer you may encounter many different types of wasps. These wasps can look similar at first glance, but they often have very different natural histories and behaviors. While one wasp species might be aggressive and sting, another may be more interested in the food you're serving at your family picnic or the juicy spiders in your garden. The following descriptions are intended to help landscape professionals and gardeners identify a few common wasps and determine whether they are problematic, neutral or beneficial in your shared space.

Yellow Jackets, Hornets, Paper Wasps and Potter Wasps (Vespidae)

While adult **eastern yellowjackets** (*Vespula maculifrons*) feed on nectar and other sweet foods, they seek out protein rich foods to feed their grub-like young. They may carry insects or bits of meat from a picnic or trashcan back to their nests to feed their young. The nests are constructed underground and may house as many as 2000 individuals. Like honey bees, yellowjackets are social and their nests house queens, workers and drones (males).

Early in the season these insects may not be aggressive but as the season progresses and food sources become less available, yellowjackets may become persistent in their search for food and sting more easily. Their stings are painful and can be life threatening for people with wasp or bee allergies. These and other yellowjacket species may need to be controlled if they nest in a high traffic area, a location where work needs to be done or a location where children play. Wasps and bees are active during the day, so if nest control is needed, an insecticide labeled for wasps should be applied at night.



Top left: Eastern yellowjacket (*Vespula maculifrons*) adult, Gary Alpert, Harvard University, Bugwood.org

Top right: Northern paper wasp (*Polistes fuscatus*) Jon Yuschock, Bugwood.org

Bottom: [Potterwasp](#) (*Eumenes fraternus*), Jon Yuschock, Bugwood.org

Northern paper wasps (*Polistes fuscatus*) are a species you might recognize as the wasps that build a nest under overhangs or near outdoor lights on homes. Their nests are sometimes called “umbrella nests” because they often have a curved top with open comb-like cells on the underside. The nests are built in the spring by a few females but after a queen is established, the nest may grow to house as many as 200 individuals.

Northern paper wasps forage for protein rich food like insects and bits of carrion, as well as sweet foods like nectar and fruit. Northern paper wasps are usually docile but may become aggressive if their nest is disturbed. Like eastern yellowjackets, they can be controlled if they become a risk to people by nesting in a high traffic area like a lamp or overhang near a door. If treatment is needed, it should be applied at night.

Potter wasps (*Eumenes fraternus*) are solitary in nature. Each female builds a marble sized mud urn to house one or multiple offspring. The nests may be built on plants or on the sides of homes. The adult collects insect larvae or spiders and puts them inside the mud nest before laying one or more eggs and sealing the chamber. The young will hatch and feed on the stored food items until they emerge from the nest as adults. The adults feed on nectar from flowers. These wasps rarely sting people and may help remove caterpillars in the area.

Thread-waisted Wasps (Sphecidae)

Black and yellow mud daubers (*Sceliphron caementarium*) are solitary wasps about 1 inch long. These wasps usually have an elongated and very slender attachment point between their abdomen and thorax. Nests are constructed using small amounts of mud carried from puddles or other bodies of water and situated in sheltered locations, including porches and building overhangs. These wasps are behaviorally similar to potter wasps, preying upon insects and spiders, then storing and sealing them in their nests for their developing young. The adult wasps feed on the nectar of flowers like Queen Anne's lace and rarely sting people.



Black and yellow mud dauber (*Sceliphron caementarium*), Howard Ensign Evans, Colorado State University, Bugwood.org

Cicada killers (*Sphecius speciosus*) are large wasps, about 2 inches long, with red-brown heads, black bodies and yellow banding on their abdomens. Females sting and paralyze cicadas, which they carry back to their subterranean burrow to feed their young. Females may sting people but this typically only occurs if someone attempts to handle them or if they are stepped on.



Cicada killer (*Sphecius speciosus*), Nancy Hinkle, University of Georgia, Bugwood.org

Cicada killers are sometimes confused with Asian giant hornet (*Vespa mandarinia*) because of their large size but they are a native species that rarely sting humans. Asian giant hornets are not native to North America and have not been identified in Illinois. For more information about cicada killers, please refer to [Issue 11, 2018, of the Home, Yard & Garden Pest Newsletter](#). For more information about Asian giant hornet, please refer to [Issue 3, 2020, of Home, Yard & Garden Pest Newsletter](#).

Spider Wasps (Pompilidae)

Spider wasps vary in size but most are about ½ inch long. They are usually black, but may have a bluish shine, with transparent wings. Wasps in this group stun spiders with a venomous sting and are protected from the spider's bite by their hard exoskel-



Spider wasp
David Cappaert, Bugwood.org

eton. After stunning the spider, the wasp will carry it back to her burrow or mud cell to feed her single offspring. Adult wasps feed on the nectar of flowers or honeydew produced by aphids. Spider wasps are not aggressive but may sting if they are threatened or handled. Spider wasp species in Illinois can have a mildly painful sting, though some species native to the Southwest (tarantula hawks) can produce a very painful sting. Give these insects a respectful distance if you are vacationing in the Southwest.

Parasitoid Wasps (multiple families)



Left - Tomato hornworm caterpillar parasitized, Maria Turner, University of Illinois

Right - Braconid wasps on a centimeter scale, Jim Occi, BugPics, Bugwood.org

Parasitoid wasps feed and develop on other insects, making them beneficial to landscapers and gardeners. The image above shows a tomato hornworm (left) that has been parasitized by braconid wasps (similar species shown right). These wasps lay their eggs in the caterpillars. As the young develop inside the caterpillars, the caterpillars will slow or stop feeding on the plants. When the young larvae mature, they will pupate in tiny cocoons on the surface of the parasitized caterpillars (pictured left). These tiny cocoons are a good indication that these beneficial insects are making a home in your garden. When they emerge as adult wasps, they will feed on the pollen, nectar of flowers or honeydew from aphids, then seek out a new caterpillar host for their own young. Parasitoid wasps do not sting people the way a hornet or bee might. If you find a parasitized caterpillar, the best thing to do is leave it undisturbed so the wasps can reproduce and consume more pest insects.

Sarah Hughson
Hughson2@illinois.edu

Purple Weed Blooms Abound

It's been a great spring for the color purple. The redbud trees are in full bloom and looking glorious in the central part of the state now. But for several weeks, the ground has been purple as well due to a few cool-season weeds that seem to be enjoying the mostly moderate temperatures we've been having. The landscape colors have been striking. Of course, pollinators appreciate these early season blooms too! I've recently witnessed some confusion surrounding the identification of the following weeds, so a little review could be useful.

Henbit (*Lamium amplexicaula*)

Henbit has perhaps been the most noticeable as it covered acres and acres of fields. However, it's starting to disappear as the fields are now being sprayed, tilled, and planted.

Yes, henbit interferes with germinating crop seeds by keeping the soil cool and shaded. This cool-season annual or biennial is generally low growing but can grow to 16 inches tall. As a mint, the stems are square-shaped (4 sided). Additionally, stems are green to purplish, and may be smooth or hairy.



Henbit flowers and leaves, Chris Evans, University of Illinois, Bugwood.org



Henbit plants, Michelle Wiesbrook, University of Illinois

The leaves are triangular to circular in shape and have palmate venation with a deep crinkle along the veins. The leaf edges have rounded teeth. Upper leaves are borne directly on the stem, while lower leaves are found on long petioles (opposite each other). Leaves are typically 1/2 to 1 inch long and hairy. They often begin as a dark green but tend to lighten in color as they age. The roots are fibrous. Henbit flowers are tubular, up to 3/4 inch long, pink to red to purple, and borne in whorls in the upper leaf axils (where the leaves meet the stems). To me, they look like pink puckered lips. Henbit normally produces flowers April to June but can sporadically until fall. Reproduction is by seed and by rooting stems.

Purple deadnettle (*Lamium purpureum*)

Purple deadnettle is a winter annual with triangular-shaped leaves which are less deeply lobed than those of henbit. They are attached to the stem by a short petiole. An important note is that the leaves and stems are often conspicuously red or purple which lends to the plant's name. This plant looks very similar in overall growth and leaf shape to spotted deadnettle, a perennial groundcover that has white markings on the leaves. Purple deadnettle can sometimes be found growing alongside henbit in Midwestern farm fields.



Purple deadnettle flowers and leaves, Joseph M. DiTomaso, University of California - Davis, Bugwood.org



Purple deadnettle plants, Robert Vidéki, Doronicum Kft., Bugwood.org

Ground ivy (*Glechoma hederacea*)

Ground ivy is another low growing weed with a purple flower. Commonly found in lawns and landscapes, it may be difficult to control but it is actually quite pretty when in full bloom. Also known as creeping Charlie, this plant is a creeping perennial with smooth (sometimes hairy) leaves in pairs on long petioles. Leaves are 1/2 to 1 1/2 inch in diameter. The leaf shape is round to kidney-shaped with a rounded toothed margin. The color is medium to dark green. Ground ivy emits a minty odor when crushed or mowed. Flowers appear April to June and are small, lavender to blue-purple, and funnel shaped. They are found clustered in the leaf axils. Ground ivy is a common weed of lawns and is sold as a groundcover.



Ground ivy flowers and leaves, Michelle Wiesbrook, University of Illinois



Ground ivy plants, Michelle Wiesbrook, University of Illinois

Common violet (*Viola* spp.)

Common violet is a common lawn weed that many are familiar with. A dense stand of violets in bloom can be striking. This cool-season perennial spreads by seeds and by creeping rhizomes. The leaves are kidney-shaped to broadly oval, with a heart-shaped base and a pointed tip. The margins are typically toothed. Leaf size is 2 to 4 inches. Stems are low growing typically but can reach 12 inches in height. Many colors of flowers ex-



Violet flowers and leaves, Michelle Wiesbrook, University of Illinois



Violet plants, Michelle Wiesbrook, University of Illinois

ist from white to blue to purple to yellow. Cultivated types exist as well. Violet blooms early in the spring and is common across lawns and landscapes but not field crops. Although, I did see my first case of it growing happily in a corn stalks this year – not too far from the lawn.

As a reminder, a plant is considered to be a weed only when unwanted. You may not mind them growing in your lawns, fields, and beds and that's fine. One person's weed is another person's flower and vice versa.

Michelle Wiesbrook - buesinge@illinois.edu

Mayapple Rust

You probably won't find mayapple (*Podophyllum peltatum*) in a typical landscape. However, this herbaceous perennial is common in many woodland areas. The plant emerges in early spring to capture sunlight before the trees canopies above produce leaves and shade. Mayapple then senesces and goes dormant by mid-summer. I recently encountered numerous mayapple colonies, with their unmistakable umbrella-like leaves, while walking through my neighbor's wooded lot.



Mayapples infected with rust

Several of the plants had symptoms of mayapple rust. The upper surface of the affected leaves displayed yellow or light green spots, while the lower leaf surfaces displayed striking, bright orange spores and pustules. Some leaves puckered where the lesions occurred. Despite the appearance and some leaf drop, mayapples seem to tolerate the disease without permanent injury. Mayapple rust is not considered a significant problem and does not require treatment.



Interestingly, mayapple rust is autoecious and does not require an alternate host. This contrasts with the heteroecious rust diseases that infect many landscape plant species. Heteroecious rust diseases, such as cedar-apple rust, need two host plant species to complete their life cycle.

The mayapple rust pathogen was previously named

Puccinia podophylli. In 2012, Minnis et al. resurrected *Allodus podophyllias* as the accepted name for this species based on DNA sequence analysis of this and other rust species. For information on the name change view: [Mayapple Rust Resurrection https://driftlessprairies.org/wp-content/uploads/2015/02/Mayapple-Rust.pdf](https://driftlessprairies.org/wp-content/uploads/2015/02/Mayapple-Rust.pdf)

Travis Cleveland - tclevela@illinois.edu

Jumping Worm Update

Jumping worms were first identified in Illinois in 2015. These invasive earthworms have been confirmed in several counties across the state, and observations suggest eggs can overwinter in warmer parts of the state. Jumping worms are native to East Asia. They have been sold in the United States as bait under the names crazy worm, Alabama jumper, and snake worm. The worm has characteristic coloration and behavior. Adult worms are approximately the same size as other naturalized earthworms, but are much darker. Most of the body is dark gray or brown, with a milky white or light gray band of tissue (the clitellum) circling the body. The clitellum is smooth, compared to other species where the clitellum is raised compared to the body. When disturbed, jumping worms become very active, wriggling and thrashing vigorously.



Jumping worm identification features

Jumping worms are voracious consumers of organic material, which can affect soil quality. Organic matter in the soil is converted to earthworm casings, giving the top layers a grainy structure that looks like dry coffee grounds. This affects the soil structure, availability of nutrients in the soil, and soil water holding capacity. In turn, these changes can affect plant growth.

They breed quickly and eggs survive Illinois winters. Adults reach maturity in approximately 60 days, allowing populations to double during the growing season. These worms are also capable of reproducing without mating. There are concerns about the effect these worms will have on native areas, ornamental plantings, and agronomic fields. The worms have been identified in several U.S. states, including Wisconsin (2013) and Indiana (2015). From reports from Wisconsin, it appears that these worms are most damaging in areas without other established earthworm populations.

Management consists of preventing the spread of these invasive worms. Recommendations to prevent the spread of jumping worms and their eggs include cleaning equipment before moving to another site, reducing the transportation of mulch and soil, and carefully inspecting nursery plants before installing them in a new landscape. If soil is infested, maintaining organic matter through fertilization and mulching may help reduce the adverse effects of the worms.

For more information, please see: <https://extension.illinois.edu/news-releases/keep-eye-out-jumping-worms-gardening-season>

Fact Sheet: https://extension.illinois.edu/sites/default/files/jumping_worms_factsheet_04152021.pdf

Diane Plewa - dplewa@illinois.edu

Easter Lily Care

If you were gifted an Easter lily (*Lilium longiflorum*) in April, you might be wondering what you do with it after it blooms. Often, they are tossed into the trash as a one-hit-wonder, but these lilies have the potential to bloom again in the summer or the late fall, providing the plant and weather cooperates.

Easter lily, also known as the Bermuda lily, is native to the Ryukyu islands of Japan. They were

introduced to the U.S. in 1919 by Louis Houghton, a World War I soldier, who brought them back in a suitcase for family and friends. He brought them to the west coast, where they are now commercially grown for the potted Easter Lily Market. According to the National Agriculture Statistics Service, the sales of Easter Lilies in Illinois are worth a little over \$500,000, a fraction of the 24 million-dollar sales across the United States.

When the Easter lily blooms, the cooler you keep the plant, the longer the flowers will bloom before falling off. Once the first flower blooms, the others generally follow within a week or two. Another way to keep it blooming longer is to remove the pollen sacks immediately. This will also prevent the pollen from staining furniture and clothing. Be sure to cover your fingers with a tissue and then gently twist off the pollen sacs.

If you plan to keep your lily indoors, it should be kept away from drafts and heating sources that will dry the plant. Bright and indirect light is the best with temps 60 – 65 day temperatures. Water the plant only if the soil is dry to touch. Do not overwater as it may cause rot, and the bulbs will turn to mush.

If planting outdoors, be sure to plant it at the same depth as the pot. Water thoroughly and fertilize. Like above, you want to keep this in an area with partial sun/afternoon shade and not in a place where it will remain wet. Be sure not to trim back any of the green, as it provides energy to the bulb.

Easter lily is hardy to USDA Zone 7, which means they most likely won't make it through the winter, although if protected with mulch and a mild winter, they might come back. Those in Southern Illinois might have more luck keeping them yearly. Should you not want to risk a deep freeze, plant it in a container that can be brought back indoors for the winter.

Maria Turner mrestrep@illinois.edu

Sources:

<https://lancaster.unl.edu/hort/nebline/easterlily.shtml>

https://www.nass.usda.gov/Publications/Todays_Reports/reports/floran20.pdf

Modified Growing Degree Days

Station Location	Actual Total	Historical Average (11 year)	One-Week Projection
Base 50° F - March 1 through May 2			
Freeport	223	99	249
St. Charles	251	103	282
DeKalb	236	100	267
Monmouth	273	158	309
Peoria	292	179	334
Champaign	299	201	345
Springfield	316	250	364
Perry	341	238	391
Brownstown	321	239	378
Belleville	374	315	436
Rend Lake	419	350	482
Carbondale	408	340	476
Dixon Springs	432	366	504

Insect development is temperature dependent. We can use [degree days](#) to help predict insect emergence and activity. Home, Yard, and Garden readers can use the links below with the degree day accumulations above to determine what insect pests could be active in their area.

[GDD of Landscape Pests](#)

[GDD of Conifer Pests](#)

Degree day accumulations calculated using the [Pest Degree-Day Calculator](#) (a project by the Department of Crop Sciences at the University of Illinois and the Illinois Water Survey).

Kelly Estes – kcook8@illinois.edu



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