UNIVERSITY OF MARYLAND EXTENSION | AgFS Agriculture & Food Systems

Vegetable & Fruit News

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Fig 1.) Cabbage Maggots feeding on cole crop roots. Photo H. Schug

Maggots in Cole Crops and Alliums

Hayden Schug, Agent, Charles County, UMD & Veronica Yurchak, Extension Vegetable Specialist, UMD.

While scouting fields earlier this week, cabbage maggot larvae were found feeding on mature cole crop roots in Southern Maryland. Onion maggot larvae were also found feeding on mature onions on the Eastern Shore. Although these maggots are a pest growers typically associate with spring production, populations can persist throughout the growing season, particularly during periods of cooler weather or when irrigation has been high. While the first generation typically causes the greatest economic damage, cabbage maggots can produce 3-4 generations each year, with the final generation often remaining active into October during warmer years.

Adult onion and cabbage maggots are both small gray flies that resemble small house flies. The adults lay eggs in the soil at the base of plants, and once the eggs hatch, the white larvae (maggots) begin feeding below ground level on bulb/roots and lower stems (Fig. 1 & 2). Eggs typically hatch within 3-7 days, allowing larvae to quickly begin feeding on plants. Because the damage occurs beneath the soil surface, infestations can often go unnoticed until plants begin showing aboveground symptoms. The first signs of injury are often plants that appear stunted, wilt during the heat of the day despite proper soil moisture, or begin to yellow (Fig. 3). Pulling affected plants often reveals tunneling in the bulb/roots or lower stem.

Fig 2.) Onion maggots feeding on mature onion bulb. Photo V. Yurchak

Feeding wounds also provide entry points for secondary diseases such as bacterial soft rot, increasing losses beyond the initial insect damage. In severe infestations, the root system may be so heavily damaged that plants pull from the soil with little effort because much of the root tissue has already been consumed or damaged. Affected roots may also have a soft, decaying appearance and produce a noticeable rotting odor. Young seedlings and recently transplanted cole crops are especially vulnerable, while larger, well-established plants are generally better able to tolerate some level of feeding.

Fig. 3) Kale wilting due to severe feeding damage. Photo H. Schug

Unfortunately, once maggots have entered the roots/bulbs there are no rescue treatment options, making preventative management critical. For future plantings, growers can reduce maggot pressure by avoiding successive host crop plantings in the same field, incorporating crop residue soon after harvest, and allowing it to fully decompose before planting another cole crop. Floating row covers can also be highly effective when installed immediately after planting to prevent adult flies from laying eggs around the base of susceptible plants. Be sure to place row covers prior to the start of adult fly activity to ensure no egg laying occurs before the exclusion netting is established. Where maggots have been a recurring problem, the use of treated seeds or transplant insecticide applications may be a good option, particularly for higher-value crops. Products containing cyantraniliprole (Verimark) are commonly used as transplant tray drenches, while directed applications of products such as Belay, Warrior II, or Mustang may also provide control when directed at the base of the transplants where flies are likely to lay their eggs. Regardless of the product selected, applications are most effective when the insecticide is concentrated around the base of the plant where eggs are deposited. Even under good management, some level of feeding injury should be expected. As always, follow all label restrictions and application recommendations.

2026-2027 Mid-Atlantic Commercial Vegetable Production Recommendations Guide can be found at **https://go.umd.edu/MACVPRG**

July Vegetable Scouting Tips

Veronica Yurchak, Extension Vegetable Specialist, UMD

Cucurbits: Squash bugs, vine borers, aphids, spider mites, and cucumber beetles are all active. For squash bugs, scout for copper colored egg masses usually (but not always) laid on the underside of leaves. The threshold for squash bugs is 1 egg mass per plant. Insecticide applications for squash bugs should target the young nymph stage. Acetamiprid (Assail), lambda-cyhalothrin (Warrior II), sulfoxaflor (Transform), and flupyradifurone (Sivanto) all provide greater than 80% squash bug mortality. Labeled options for squash vine borer include Assail, the combo product Cormoran, and various pyrethroids. If treating for other pests such as squash bugs and aphids, Incipio and Exirel can also provide SVB control. Keep in mind that frequent pyrethroid applications can eliminate natural enemies and result in increased aphid and mite populations, and that pyrethroid resistant cucumber beetles have been detected in several areas on the Eastern Shore. Assail and Harvanta are both effective alternatives to pyrethroids for managing cucumber beetles. A recent article from Michigan State University on the collective management of various cucurbit pests can be found at https://bit.ly/MSUCUCU.

Continue to monitor for spider mites, making sure to use 5-10x magnification to detect mite eggs or small larvae, which may be present in much greater numbers than adult spider mites. Abamectin and acequinocyl are highly effective for controlling both spider mites and broad mites. Other options with efficacy primarily on spider mites are listed in the recommendations guide.

Potatoes: Continue scouting for potato leafhoppers and Colorado potato beetles. The threshold for potato leafhopper is 1 per stem. Remember to harvest potatoes as quickly as possible to reduce the potential for wireworm damage.

Solanaceous Crops: Keep an eye out for beet armyworm, which is beginning to show up in the region. Beet armyworms may be resistant to diamide insecticides. Yellow striped armyworms (YSAW) have also been found in tomatoes, peppers, and eggplant. Early control of YSAW is recommended, as larger stages become more tolerant of many insecticides. Continue scouting for thrips and symptoms of tomato spotted wilt virus. Remove infected plants to reduce potential virus spread. In eggplant, the second generation of Colorado potato beetles is active. Recommended thresholds for eggplant over 6” tall are 4 small larvae or 2 large larvae per plant.

Regional reports of southern blight in tomatoes and peppers are beginning to emerge, though the pathogen can infect nearly all vegetable crops. The most common symptom occurs on the lower stem area at the soil line, where a brown/black lesion develops and may completely girdle the stem, causing plant wilting and potential lodging. Later stages of the infection will show characteristic sclerotia, which look similar to mustard seeds on/around the base of the stem.

Sweet Corn: Trap counts for corn earworms have been fairly low across the state over the past week or so, but high temperatures speed up egg hatch and increase feeding/development rates of existing eggs and larvae. Extension entomologist David Owens at University of Delaware recommends keeping a tighter spray schedule, despite lower trap counts, following a pyrethroid or pyrethroid+methomyl application. Japanese beetles are also actively clipping silks at this time.

Ten Years of Managing Grower-Friendly Apple Trees Created at the Maryland Research and Education Center in Keedysville, Maryland

Christopher Walsh, Carol Allen, Julia Harshman, Kathleen Hunt,[1] and Douglas A. Price[2]
[1.] Department of Plant Science and Landscape Architecture, UMD. [2] Western Maryland Research and Education Center, Keedysville, MD.

During the past winter we interviewed more than 100 people in the apple business ecosystem. When we asked them what their most important problem is. Their answer was “labor”. This is not only a problem for American apple growers. It was a top problem mentioned by fruit growers in the Republic of South Africa and by fruit growers in Chile, Peru and Mexico.

To address the labor issue, we began an apple breeding project in the 1990s. Our goal was to create grower-friendly apple trees with reduced susceptibility to fire blight, were scion-dwarfed to reduce pruning labor, and produced quality apples under Maryland's hot, humid growing seasons.

To test the tree size, vigor and management needs of our apple trees, we planted a series of our "Elite Selections" a decade ago at Keedysville. Each selection was grafted onto a clonal semi-dwarf rootstock. Merton-Malling 111 (M,111) is a vigorous semi-dwarf stock that produces trees that are about 70 percent of standard size. Trees were planted at a 9 by16 foot spacing (302 trees per acre) in four randomized blocks. Each replicated plot in this planting consisted of three trees of the same scion-rootstock combination. The trees were left unpruned for a decade to observe their natural size, architecture, and fruit quality.

After ten years of unpruned growth, these elite trees had outgrown their initial spacing and were difficult to manage (Fig 1). During this past winter, two of the three trees in each replicated plot were removed. The remaining trees were lightly pruned in March, 2026. Pruning cuts were made prior to budbreak using a lightweight chainsaw on a pruning pole. The time needed to make the necessary thinning-out cuts was recorded as minutes per tree. To make the pruning times meaningful, time per tree was multiplied by 302 to give an estimated pruning time required per acre.

Fig 1.) Ten-year-old apple trees planted at a 9 by 16 ft spacing. The conically shaped apple trees on the left are MD-TAP1 on M.111 rootstock. The larger, denser canopies of the spherical-shaped trees on the right are CP 101, propagated on the same rootstock. Photo C. Walsh

The architecture of these seedling trees varied considerably (Fig 1). There was a dramatically larger canopy volume between CP101 and MD-TAP1 trees budded on M.111 rootstock. We also noted an increase in pruning time with an increase in trunk cross-sectional area (TCA). This is logical, as the TCA is correlated with the dry weight of wood measured in an unpruned apple tree.

Once we saw that it was possible to develop a much smaller tree on M.111 rootstock, we began trials with MD-TAP1 and MD-TAP2 budded on G.890 rootstock. Geneva 890 is a precocious, semi-dwarf rootstock recently released by the USDA/Cornell University apple-rootstock breeding program. Our goal with these plantings was to test whether the scion dwarfing in the MD-TAP patented trees budded onto a semi-dwarfing rootstock could create a manageable pedestrian orchard.

To maximize early production, no pruning was made on the G.890 planting until the summer of the third leaf. That pruning merely isolated the central leader. At the beginning of the fourth leaf, rootstock suckers were removed and the central leader was headed at about eight feet (Fig 2). No additional heading cuts were made in the scaffold limbs to keep them pliable. This dormant pruning was completed quickly; it required about 30 seconds per tree. With fewer simple tasks, we believe these trees sill recuce hand labor, and could be easier to handle using mechanized, robotic pruning.

We began planting MD-TAP1 and MD-TAP2 trees on G.890 rootstocks at Keedysville in 2023 using a six-foot in-row spacing. Since that worked well, we planted rows of this same scion-rootstock combination at 40, 60 and 80 inch in-row spacings in 2025. In that 2025 planting we hope to train the trees to be 'robot-ready'.

Fig 2.) This row contains both MD-TAP1 and MD-TAP2 apple trees on Geneva 890 rootstock spaced 6 feet apart in the row. Trees began cropping in September 2025, and were minimally pruned in April 2026. Photo C. Walsh

While the University of Maryland does not propagate trees for sale, we are working closely with commercial fruit-tree nurseries to evaluate this budwood. Once nurseries begin commercial propagation, growers should be able to plant orchards that require less labor. These trees could also eliminate the need for trellising for a manageable pedestrian orchard.

Below we have list a few attributes of the elite trees evaluated in this planting:

CGM-1W (An unpatented seedling thought to be McIntosh Wijcik pollinated by Gala)

- Trunk cross-sectional area 15.2 cm^2
- Upright spur-type tree with short, stiff branches and short internodes
- Produces large, yellow apples that ripen in early September
- Pruning time estimated - 10.1 hours per acre.

MD-TAP1 (A patented, novel seedling of Goldrush apple tree)

- Trunk cross-sectional area 20.4 cm^2
- Upright spur-type apple tree with some pliable branches and short internodes
- Produces yellow apples that ripen in early September
- Pruning time estimated - 10.1 hours per acre.

MD/TAP2 (A patented, novel seedling of Fuji apple tree).

- Trunk cross-sectional area 23.9 cm^2
- Upright spur-type tree with still branches and short internodes
- Red apples that ripen in mid-September to mid-October
- Pruning time estimated - 22.6 hours per acre.

F610 (An unpatented, vigorous Fuji seedling apple tree)

- Trunk cross-sectional area 23.0 cm^2
- Upright tree with a strong central leader and good branch angles)
- Yellow apples that ripen in late September
- Pruning time estimated - 51,3 hours per acre.

CP101 (A patented, Cripps Pink seedling apple tree marketed as Antietam Blush)

- Trunk cross-sectional area 35.2 cm^2
- "Umbrella-type" tree with thin branches that fruit on lateral and terminal buds
- Produces red apples that ripen in mid-to-late October
- Pruning time estimated - 65.4 hours per acre.

Recent High Temperatures Could Reduce Yield and Quality in Some Vegetables.

Emmalea Ernest, Extension Fruit & Vegetable Specialist, UD
****This article first appeared on the UD Weekly Crop Updates on 7/10/2026.****

In the last few weeks, the Mid-Atlantic region had very high temperatures, which could affect vegetable yield and quality, especially in crops that were flowering or had developing flowers during that time. In tomatoes, peppers, cucurbits, sweet corn, and beans, pollination is critical for the yield and quality of the resulting crop.

Cucurbits are generally very heat tolerant, although temperatures over 100 °F are reported to impact pollination and high temperatures can decrease the number of female flowers.

The flowers of **Snap** and **Lima Beans** are most susceptible to heat stress when they are still in the bud stage. High night temperatures in the 10 days before flowers open can reduce pollination and thereby pod set. Poor pollination is responsible for curled and misshapen pods in snap beans. In lima beans, high temperatures delay pod set or can lead to split sets. The critical temperatures for snap beans are 68 °F at night and 86°F during the day. Critical temperatures for lima beans have not been established but are probably ~70 °F at night. Limas are quite tolerant of high daytime temperatures if they are not drought stressed.

Sweet Corn is susceptible to high temperatures during pollination. A recent study from the Midwestern US found that daytime temperatures above 86 °F during pollination will reduce yield. Irrigation mitigated yield loss from high temperatures up to 95 °F. Yield loss was observed even in irrigated sweet corn at temperatures above 95 °F. Sweet corn that is heat stressed during pollination will have poor tip fill or other signs of incomplete pollination.

Tomato flowers are susceptible to heat stress during the bud stage. Daytime temperatures of 90 ° F and night temperatures of 76 °F cause heat stress in tomatoes. The optimal temperatures for tomato growth are much lower: 70-82 °F during the day and 62-64 °F at night. Heat stressed tomatoes fail to set fruit or set only small fruit with few seeds.

Bell Peppers are often considered to be heat tolerant, but some recent research found a link between average daily temperature in the seven days after flowers open and eventual fruit size. Average daily temperatures above 68 °F during that time reduced fruit size, even under low fruit loads.

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What Is Cyclosporiasis?

Carol Allen, Agent Associate in Food Safety

****This article first appeared on the UMD Food Safety Newsletter on July 6 & 13 2026.****

Cyclosporiasis continues to be in the news with cases in Michigan and Ohio rising dramatically in the past week. As of July 13, 2026 there have been 1,645 cases reported in 34 states, of these 141 cases required hospitalization (Fig 1.). There have been no reported deaths. An additional 440 cases were in people were traveling outside the United States during the 14 days before they got sick. In the Mid-Atlantic, neither Maryland or Virginia are seeing the rapid increase in cases of cyclosporiasis. Virginia reports a total of 10 cases for the year and Maryland reports 32 cases, again for the year.

Travelers outside of the US are at the greatest risk of exposure to these parasites by drinking contaminated water and eating contaminated food. Within the US, a typical year may see hundreds to thousands of cases nationwide, with healthcare providers seeing the peak in domestic cases between May 1 and August 3.

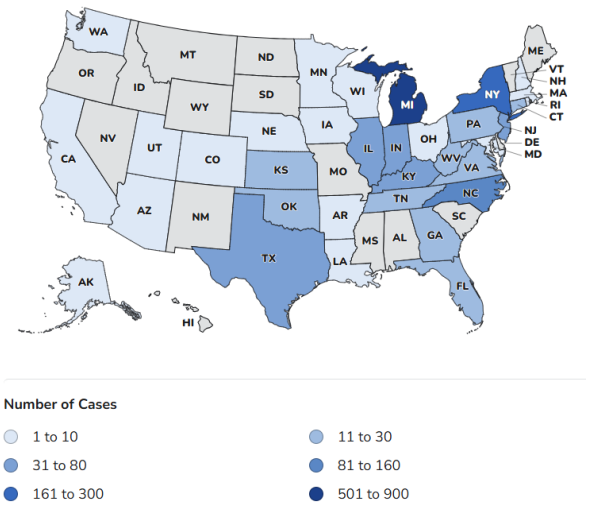


Fig 1.) This map shows where the 1,645 people with cyclosporiasis acquired in the United States since May 1, 2026. Cases may not be limited to these states, since the true number of people sick with cyclosporiasis was likely higher than the number reported. Image from cdc.gov

We typically see food borne illness outbreaks that are caused by bacteria. Cyclosporiasis is caused by a number of species of a microscopic parasite in the genus *Cyclospora*. The nature of the parasite makes trace back difficult as the life stage that is most often found in feces is an oocyst. That "resting" stage or unsporulated oocyst needs about two weeks in a favorable environment to produce infective sporulated oocysts. That lag time is what makes traceback difficult.

It is characterized by a watery, explosive diarrhea and other gastrointestinal symptoms. It is often unreported in healthy individuals. If untreated, cyclosporiasis can persist with periods of remission and recurrence.

At this time no link has been found tracing back to a common source. Clusters of cases are currently undergoing traceback efforts by the FDA. The CDC has initiated surveillance of the disease https://www.cdc.gov/cyclosporiasis/index.html

While GAP and PSR training focuses primarily on bacterial pathogens, *Cyclospora* presents us with different problems.It is an intestinal protozoan that survives in the environment as oocytes, which are difficult to assay. *Cyclospora* is also resistant to standard sanitizers and can survive on fresh produce to cause food borne illness in humans. Historically it has been found in basil, berries, peas, cilantro, lettuces, and other fresh produce.

Cyclospora has been of minor concern in countries with trained workers and good sanitation procedures. In those countries cyclosporiasis outbreaks have usually been traced to high-risk raw produce imported from areas with poor public sanitation programs.

Cyclospora is not passed from human to human directly, but is spread via the fecal/oral route. Contaminated water, often surface water, contacting produce near or at harvest or contacting contaminated soil is thought to be the typical route.

Worker training in basic health and hygiene will be an important part in preventing outbreaks (Fig 2). Emphasis should be placed on not using field areas for defecation and the importance of hand washing after using the toilet and before handling produce. As travelers can carry the parasite, worker health and hygiene training should be initiated immediately when new workers start on the farm.

At the farm level for both workers and visitors make sure to have a plan in place to clean and maintain portable toilets. Keep them away from the growing environment where contamination of produce can occur, including all sources of water. Use a reputable third-party company for cleaning, sanitation and disposal of human waste into an adequate sewage system or through other adequate means. Have a plan for monitoring and managing leakages or spills of human waste.

The presence of *Cyclospora cayetanensis* in Mid-Atlantic waters has been of increasing concern since first documented in 2018. Kalmia Kniel, Ph.D. at the University of Delaware has been looking at the prevalence of the pathogen in Delmarva waters and the possible efficacy of Zero Valent Iron filtration in removing and inactivating the protozoa in irrigation water. Read more about the project at https://bit.ly/UDCYCLS.

*Fig 2.) Downloadable and printable posters available in English and Spanish for free on Growing Safe Produce web platform (**https://pci.iica.int/**). Platform also has bilingual videos and interactive web applications.*

Upcoming UME Events!

Additional upcoming events can be found on the UME events website. *If you need a reasonable accommodation to participate in any event or activity, please contact your local University of Maryland Extension Office 2 weeks prior to the event.*

IPM Webinar Series
The series meets on the third Thursday of every month from 12 to 1 pm. For more details and registration, visit **https://go.umd.edu/ipmwebinar**. Maryland Pesticide Credits are available. If you need a reasonable accommodation to participate in this event, please contact Hayden Schug at 301-226-7502.

- **Aug 20**—Common Diseases Right Now and How to Manage Them- Dr. Ana Cristina Fulladolsa, Plant Diagnostician, University of Maryland Plant Diagnostic Lab
- **Sep 17—**Root-Knot Nematode Management in Vegetable Crops - Ben Beale, University of Maryland Extension

Anne Arundel County Urban Farm Tour and Ice Cream Social
Thursday, Jul 23, 2026, 5:00 PM - 7:30 PM, at the Anne Arundel Extension Office (97 Dairy Lane Gambrills, MD 21054). Ice cream will be served at 5:00pm followed by a walking farm tour that begins at 6:00pm. This year the tour will highlight hops, wine grapes, blackberries, sweet corn and flour corn varieties, pumpkins, high tunnel vegetables and herbs, cut flowers, and bee keeping. This event is free. If you need special assistance to participate, please contact the Anne Arundel County Extension office at 301-226-7470 by July 22nd. Register at **https://bit.ly/3TdlHj9**

Central Maryland Fields Crops Research Twilight, Barbecue and Ice Cream Social
Tuesday, Aug 04,2026, from 4:00 PM - 9:00 PM at the Central Maryland Research and Education Center (2005 Largo Road, Upper Marlboro, Maryland). University of Maryland Extension Educators and Specialists will showcase their field crop, vegetable and fruit research plots. Dinner will be served at 4:00 pm followed by homemade ice cream prior to the farm tour at 6:00 PM. This event is free. However, a reserved meal ticket is required. If you need special assistance to participate, please contact the Anne Arundel County Extension office at 301-226-7470 by August 3rd. Register at **https://bit.ly/4auWl1Z**

Cover Crop Showcase
Wednesday August 19th, 2026 from 9am to 1pm. Kings Grant Farm 7029 Quakerneck Rd. Chestertown, MD. Learn about cover crop planning and management and weed management in cover crops, and the latest results from the Maryland "planting green" research trials. Activities include: Interactive drone and cover crop related equipment demonstrations, Tour strip trials showcasing 14 species of summer cover crop & Interactive soil pit demonstration. Pesticide & Nutrient Management Credits Available. **This is a free event and lunch is included.** Register at **go.umd.edu/covercropshowcase** or by calling 410-651-1350

Farm Succession and Transition Web Series
The free program will assist Maryland farm families in starting the succession and transition planning process, including building strong communication around difficult family conversations, understanding health insurance options for farmers, and defining an effective succession plan. A grant funds the program through the Northeast Risk Management Education Center.
Each session will run for one hour beginning at noon. The schedule is as follows:

- **July 28 at noon** – *Communication Skills*, presented by Dr. Alex Chan, Ph.D., UME
- **August 4 at noon** – *Health Insurance Options for Farmers*, presented by Jesse Ketterman, Ph.D., UME
- **August 11 at noon** – *Defining an Effective Succession Plan*, presented by Paul Goeringer, J.D., LL.M., AREC

Participants can attend one or all three sessions, depending on their interests. For more information or to register, go to https://go.umd.edu/SuccessionWebinars. For more information, please contact Paul Goeringer at lgoering@umd.edu.

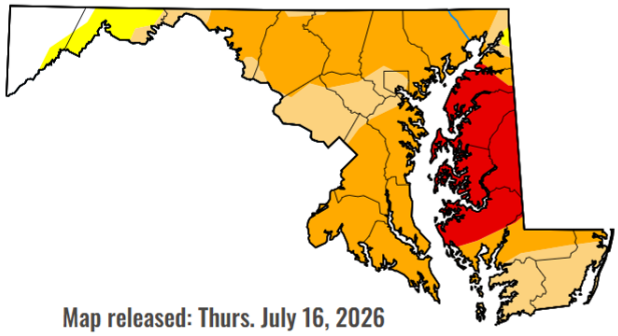
Weather Update– July 16, 2026

The weather information contained in this chart is compiled using the data collected using the Online Phenology and Degree-Day Models site (https://uspest.org/cgi-bin/ddmodel.us). The Drought Map is from U.S. Drought Monitor (**https://droughtmonitor.unl.edu/)** Information is available for free for all to use.

Table 1.) Degree Days as of July 16, 2026 at Base 50 degree Fahrenheit.

Location	Base 50°F
Annapolis (MD029)	2260.6
Baltimore, MD (BWI)	2104.9
Chestertown, MD	1953.0
College Park (KCGS)	2172.5
Frederick (KFDK)	1921.7
Garrett County Airport	1391.4
Greater Cumberland Reg (KCBE)	1881.0
Hagerstown (C1323MD)	1971.0
Jarrettsville MD	1747.9
Mont Co. Airport	2028.5
Patuent River Naval Air MD/ Lexing-	2231.1
Pocomoke City (MD070)	2158.8
Ridgely (005MD)	1977.0
Salisbury/Ocean City (KSBY)	2095.1
Vienna (MD038)	2356.3
Waldorf	1923.4

Maryland Drought Map



Map released: Thurs. July 16, 2026
Data valid: July 14, 2026 at 8 a.m. EDT

Intensity

- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)
- No Data

Authors

United States and Puerto Rico Author(s):
Curtis Riganti, National Drought Mitigation Center

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Emily Zobel, Editor
Agriculture Extension Agent

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University of Maryland Extension

(410) 228-8800
EZOBEL@UMD.EDU