UNIVERSITY OF MARYLAND EXTENSION | AgFS Agriculture & Food Systems

Vegetable & Fruit News

A research-based publication from the University of Maryland Extension Team

June 2025 **Volume 16, Issue 3**

Inside this Issue:

Bean Leaf Beetles Showing Up in Early Snap Beans

Veronica Yurchak, Vegetable Specialist, University of Maryland (vjohnso4@umd.edu)

Bean leaf beetles (BLB), *C. trifucata*, are showing up in snap beans in some areas of the Eastern Shore. This sporadic pest has the potential to cause serious damage to snap beans, soybeans, and other legume crops. Adult beetles are relatively small and range in color from yellow to red with varying numbers of black spots along their wing covers (Fig. 1). The distinguishing characteristic is a small black triangle on the upper side where the wing covers meet. This can help distinguish this pest from the spotted cucumber beetle, which is considered only a minor foliar pest of legumes.

There are typically three generations per year, with the first generation of overwintering adults emerging early in the season around the same time as snap bean planting. Adult females lay a total of 250-350 eggs over their lifetime at the base of snap bean plants. The larval stage feeds on roots in the soil but is typically not considered a major concern for the crop. The adult beetle causes the majority of the damage and can severely defoliate early seedlings and even kill plants when infestations are high enough. If occurring later in the growing season, BLB can also cause feeding scars on pods resulting in an unmarketable crop.

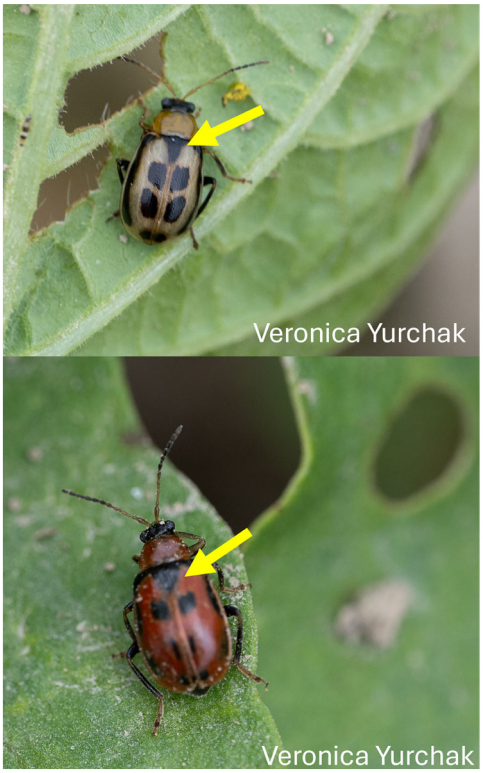

Figure 1. Bean leaf beetle adults with characteristic highlighted. Photo: V. Yurchak, UMD

BLB feeding damage to seedlings is easily recognized and appears as holes chewed in the plant leaves that may become larger as the plant grows (Fig. 2). The treatment threshold for BLB in snap beans is 20% defoliation in the prebloom stage or 10% defoliation during podding. Both pyrethroids and neonicotinoids are labeled for BLB control in snap beans and can be found in the Mid-Atlantic Commercial Vegetable Production Recommendations Guide. An efficacy trial conducted at the Virginia Tech ESAREC in Painter, VA also found BLB reductions using the organic insecticides SpinTor and Entrust.

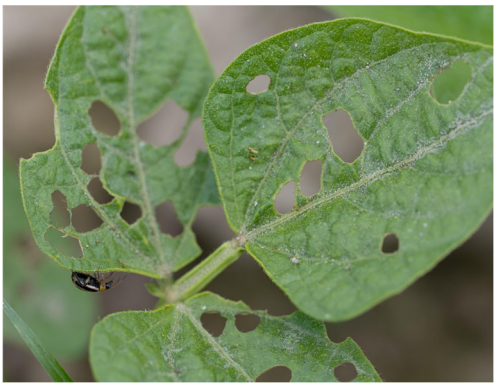

Figure 2. Bean leaf beetle feeding damage on snap bean. Photo: V. Yurchak, UMD

Cross-striped Cabbage Worms Appearing in Cole Crops

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Growers across the state should begin scouting for cross-striped cabbageworms (CSCW). Unlike the more common brassica caterpillar pests which lay their eggs individually, CSCW females lay eggs in clusters of 3 to 25. As a result, a single plant can quickly become infested with numerous hungry caterpillars, resulting in faster, more severe damage. In recent years, we've seen CSCW activity ramp up earlier in the season, and this year is no exception. Egg masses and mid-stage caterpillars have already been found in Eastern Shore counties.

Adult CSCW moths are short-lived and nocturnal, and therefore rarely seen. Egg clusters are flattened, yellow, and can typically be found adhered to the underside of leaves (Figure 1). The caterpillars are a bluish-grey color on top and green underneath, with numerous black bands across their backs and a yellow stripe down each side (Figure 1). When feeding, CSCW chew small holes in leaves until only leaf veins remain. They may occasionally also feed on, or burrow into, developing brassica heads. Infestations typically appear as completely skeletonized leaves/plants with adjacent plants undamaged.

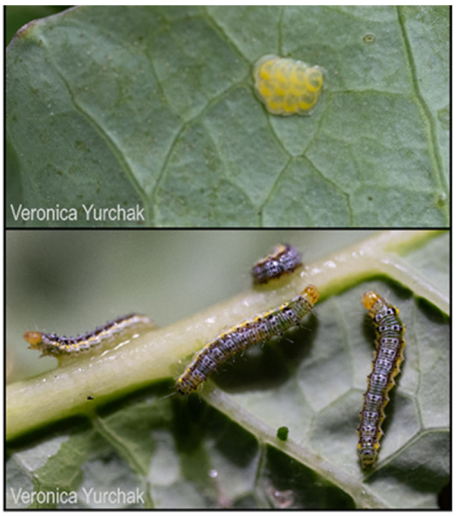

Figure 1. Cross-striped cabbage worm egg mass on cauliflower leaf (Left). CSCW larvae on kale (Right). Photo: V. Yurchak, UMD

Due to the aggressive nature of this pest, treatment thresholds are much lower than those recommended for diamondback moths, imported cabbageworms and cabbage loopers. Scout weekly to twice weekly, and spray when 5% of plants are infested with CSCW. When choosing insecticides, consider more IPM friendly products to help conserve natural enemies, as CSCW are frequently attacked by various insect predators and parasitoids. Some IPM friendly options include diamides, Bt products, and spinosyns. Also avoid over-application of nitrogen fertilizers, as this has been shown to contribute to increases in larval CSCW populations.

Spotted Wing Drosophila Active Consider Management in Cherries and Blueberries

Shea III, Research Associate, UMD, Arthur Young, Research Associate, UMD, Chia-Hua Lue, Assistant Professor of Biology, Hood College, Kelly Hamby, Associate Professor/Extension Specialist, UMD

We have detected spotted wing drosophila adults in our traps at the Western Maryland Research and Education Center; therefore, spotted wing drosophila are likely active around the state.

On farm monitoring can help track activity and population trends but thresholds are still complicated for spotted wing drosophila. In cherries, initiate management programs when 5 -10% of regional traps are capturing adults and fruit are at a susceptible stage.[1] In blueberries, in many cases early season cultivars will be ok even without management.[2] You can increase confidence in skipping early season sprays by sampling fruit for larvae.[2]

More conservatively, you can initiate management programs in cherries or blueberries as soon as fruit are susceptible, and adults are being captured. Both cherries and blueberries become susceptible as soon as the fruit color begins to change and become increasingly at risk the further ripe they become.

In terms of insecticide products, Insecticide Resistance Action Committee (IRAC) modes of action groups 28, 5, 3A, 1A, and 1B all provide good to excellent control depending on the specific active ingredient used.[3] Products and rankings for small fruit can be foud in Demchak and Hamby 2023.[3] Remember to rotate modes of action to reduce the risk of insecticide resistance developing and to follow all label instructions. The label is the law.

Figure 1. Male (black circle) and female (wide red circle) spotted wing drosophila surrounded by other drosophila species that were captured in a Scentry SWD trap. Photo: Shea III

References and other recommended resources:

1. Perkins, J., and J. Wilson. 2024. The 2024 Outlook for spotted wing drosophila in Michigan cherry orchards. Michigan State University News. https://www.canr.msu.edu/news/the-outlook-for-spotted-wing-drosophila-in-michigan-cherry-orchards

2. Isaacs, R., Wise, J., and C. Garcia-Salazar. 2022. Insecticide options for spotted wing drosophila control in blueberry. Michigan State University News. https://www.canr.msu.edu/news/insecticide-options-for-spotted-wing-drosophila-control-in-blueberry

3. Demchak, K., and K. Hamby. 2023. Unusually high spotted wing drosophila pressure. Vegetable and Fruit News. Volume 14, Issue 6. https://extension.umd.edu/resource/unusually-high-spotted-wing-drosophila-pressure/

Considerations for Control of Palmer amaranth and Other Pigweeds in Vegetables

Kurt Vollmer, Ph.D.,
Extension Weed Management Specialist

Palmer amaranth and other pigweeds have emerged and are thriving in some places (Figure 1). These weeds can quickly become too large and dense to control with many herbicides, so fields should be scouted and control measures implemented without delay (Figure 2). Shielded applications of herbicides, such as Gramoxone and Rely, applied at a spray volume of 20 gal/A can be used to control small plants between rows. Most soil-applied herbicides labeled for vegetable production will only provide fair to good pigweed control. Consult the product label before using any herbicide, and be aware of any rotational restrictions before making an application.

Figure 1. Palmer amaranth emergence in a recently tilled field, Tuesday Jun. 3, 2025. Photo: K Vollmer UMD.

Mid-Atlantic Commercial Vegetable Production Recommendations can be found at https://go.umd.edu/Vegetable-Production-Recommendations

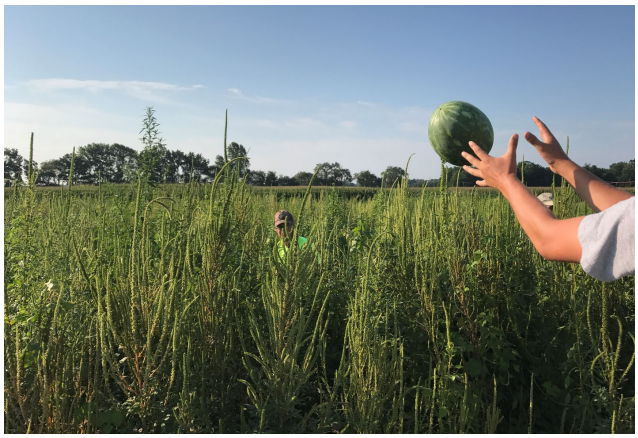

Figure 2. Harvesting watermelon in a field infested with Palmer amaranth in Georgetown, DE. Thursday, Aug. 3, 2017. Photo: K Vollmer UMD.

Cultivation can be effective on small seedlings (<3 inches), but larger plants are likely to re-grow if roots or stem remain in contact with the soil. Since Palmer amaranth can emerge throughout the growing season, repeated cultivation is necessary for control. Adding straw or another type of mulch (980 to 1,960 lb./A) can help reduce the density of Palmer amaranth and other weeds. Larger Palmer amaranth and waterhemp plants should be pulled and disposed of properly. Plants should be bagged and buried or burned along the field's edge. If working in a plasticulture system, plants will desiccate when placed on top of black plastic.

Regardless of the control method used, be sure to scout in a timely manner after each operation to determine if additional control is needed.

2025 Maryland Weed Management Twilight Tour!

June 25, 2025, 4:00 PM to 6:00 PM at the UMD Wye Research and Education Center (211 Farm Lane Queenstown, MD 21658). **Additional information and registration can be found at go.umd.edu/2025weedtwilight**

If you need a reasonable accommodation to participate in this event or activity please contact us on or before June 20, 2025 at 410-827-8056 x135.
This institution is an equal opportunity provider.

Vegetable Crop Insect Scouting

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Cucurbits – Continue to scout for striped cucumber beetle. The treatment threshold is 2 beetles per plant, and keep in mind that many beetles on the Eastern Shore are showing reduced susceptibility to pyrethroids. Harvanta and Assail are two effective, non-pyrethroid control options. Assail is also 100X less toxic to honeybees compared to many other neonicotinoids and is a good option if bees are active in the crop.

Continue scouting for squash bugs on summer squash. Treatment thresholds are an average of 1 egg mass per plant. Growers should wait to spray until eggs have hatched and a follow up spray may be necessary if a combination of eggs and nymphs are present, as eggs are impervious to insecticides.

Also begin scouting for aphids, which can stunt plants and reduce yields when populations are high enough. Aphid populations are regularly kept under control by natural enemies so watch for outbreaks following pyrethroid and other broad spectrum insecticide applications.

Squash vine borers will begin emerging in most areas of the state as we reach 1,000 GDD (50° F base beginning on Jan 1). This typically coincides with the production of runners on vines. The threshold is generally considered to be two or more adult borers per 65.5 feet of crop row.

Legumes – Continue scouting for bean leaf beetles. If found, treatment will be required when small pods begin forming. The treatment threshold for BLB in snap beans is 20% defoliation in the pre-bloom stage or 10% defoliation during podding.

Alliums – Continue scouting for thrips in onions and other allium crops. No reliable thresholds have been established for thrips management in onions. It is very important to remember to rotate products when spraying for thrips. Entrust, several neonicotinoids and pyrethroids, Torac, as well as a few other products listed in the recommendations guide can all be used.

Cole Crops – Continue to monitor for caterpillars – imported cabbageworm, diamondback moth, cabbage looper, and cross-striped cabbageworm. Remember the threshold for cross-striped cabbageworm is worms present on just 5% of plants.

Potatoes – According to David Owens in Delaware, potato leafhoppers have been reported in low numbers on the Eastern Shore. Thresholds are 1 adult or nymph per 10 leaves. Group 4 insecticides, pyrethroids, carbamates, Torac and Portal are all labeled for leafhoppers. Sivanto (group 4D) and Portal have lower bee toxicity. For all insecticide applications, treat later in the day when pollinators are less active.

In fields with a history of wireworms, blooming potatoes can be treated with Movento, which can suppress wireworms by moving down into the root system. Movento is also labeled for nematode suppression.

Eggplant and Tomato – Flea beetles and colorado potato beetles continue to be the primary pests in eggplant. Tomatoes are typically much more tolerant of these pests. Treatment thresholds for flea beetles in eggplant are 2 beetles per plant in early eggplant transplants (< 3’ tall), 4 beetles per plant in 3-6’ tall plants, and 8+ beetles per plant for eggplants over 6’ tall. Watch for thrips and stink bugs moving into tomatoes following small grain harvest later this month.

BENEFICIAL BUG SPOTLIGHT:

D. INSULARE

Veronica Yurchak, Vegetable Specialist, University of Maryland; vjohnso4@umd.edu

The goal of this series is to increase awareness and knowledge of beneficial insects in cropping systems to help differentiate them from pests of concern. *Diadegma insulare* is the most important parasitoid of the diamondback moth (DBM) in North America. This wasp has been known to parasitize up to 70% of DBM larvae in many areas of the US and is commonly found in brassica fields in the Delmarva region. In 2022, DBM parasitism rates of over 75% were found in multiple locations in Virginia.

The wasp itself is small (~6mm), rarely seen, and not easily differentiated in the field from other parasitoid wasps. *D. insulare* presence is more easily detected by looking for the tell-tale sign of DBM parasitism – parasitized BDM pupae. Upon finding a host, the female wasp will insert a single egg into a mid-size DBM caterpillar (Figure 1). A single wasp can lay up to 800 eggs in her lifetime! The egg then hatches and the wasp larva feeds and develops inside the DBM caterpillar, which survives just long enough to spin its cocoon. Shortly afterwards, the BDM caterpillar dies and the wasp builds its own pupal case inside the DBM cocoon. Over time, this changes the appearance of the cocoon from the light greenish color of a healthy BDM pupa to a darker color (Figure 2), at times with a distinctive white band across the middle. After about one week, a new adult wasp emerges. There are typically 4 to 6 generations of parasitoid wasps per year, coinciding with the number if DBM generations, and the parasitoid overwinters in the pupa stage in crop debris within the DBM cocoon.

Figure 1. D. insulare wasp parasitizing a small BDM caterpillar. Photo: M. Furlong University of Queensland.

Adult *D. insulare* wasps are very sensitive to insecticides, and larvae will similarly die inside the DBM if the caterpillar is killed by an insecticide. Severe DBM outbreaks are often associated with intensive insecticide use, which quickly reduces populations of parasitoid wasps but is oftentimes less effective on the DBM itself, which easily develops resistance to many insecticides. Thus, more selective, IPM friendly products (e.g., *Bt*) are often recommended early in the season to protect natural enemies like *D. insulare* and allow their populations to build. Larger parasitoid populations can also be supported by providing areas near cole crop fields containing flowering plants such as sweet alyssum, wild mustard, and buckwheat, which serve as preferred nectar sources for adult wasps.

Figure 2. (Top) Healthy DBM pupa. (Bottom) Parasitized BDM pupa. Photo: M. Furlong University of Queensland; & V. Yurchak.

Climate Change and the Orchard: It's Been a Difficult Spring for Fruit Growers

Christopher S. Walsh, Professor Emeritus, Department of Plant Science and Landscape Architecture

This spring's weather was unkind to Maryland fruit growers. Whether you believe in climate change or not, you know that an early bloom, an advective April freeze, and one of the wettest months of May on record has hurt fruit production.

On April 9, many apple and peach trees were in bloom. At the University orchard in Washington County, 20F was recorded during an advective freeze (Figure 1). As this was caused by a cold, windy air mass from Canada, the usual frost protection measures used during radiational freezes were ineffective. Years ago, apple bloom at this orchard began on about April 20 and ended in early May. An early bloom in 2025 resulting from warmer winter weather, coupled with a late-spring freeze lead to major crop losses. We have grown Gala at Keedysville for more than 40 years. This is the first I can recall of a near-total loss of fruit on that variety. Oddly enough, GrannySmith trees at the same site still appear to be carrying a full crop.

Then the spring weather got wet and windy. Rainfall in May 2025 was well above average. Weathermen in Washington DC noted it was one of the top ten May rainfalls ever recorded. This was particularly hard on our early -season strawberry growers. Multiple rains in early May were particularly difficult to manage on early-season plasticulture plantings in Southern Maryland and on the Eastern Shore.

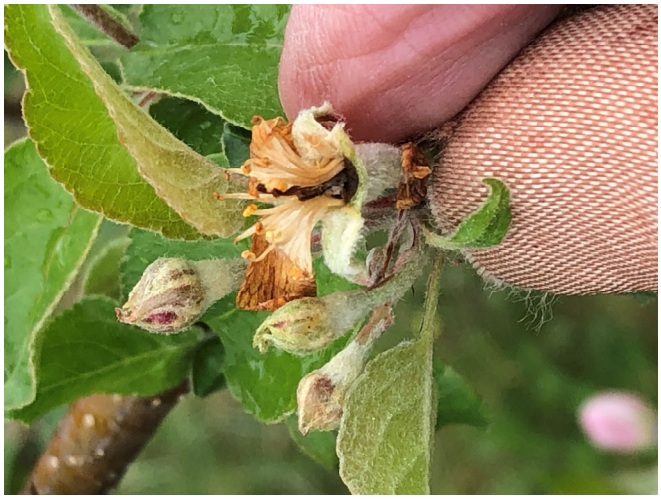

Figure 1. April 9 freeze damage to apple flowers. Photo by C. Walsh

In a typical year, heavy May rains would trigger a severe fire blight outbreak. Thankfully, growers report less-than-average fire blight despite the rainy weather. Strikes appear to have been primarily to susceptible varieties such as Cripps Pink, CrimsonCrisp and hard-cider varieties like Dabinett. Did the early-April freeze greatly reduce the fire blight inoculum? Or did the freeze-damaged flowers reduce the chances for *Erwinia* colonization and shoot blight?

With the uneven effects on crop, growers did not choose to chemically thin. Growers who did thin used a light dose to - hopefully - break up clusters. Either way, we can expect a heavy return bloom in 2026. I've never favored adding a light application of summer growth regulators to enhance return bloom. This year, I doubt anyone will find that necessary, unless they were lucky enough to set a bumper crop. While we are looking at a light apple crop, the low set counts and heavy May rains should lead to excellent fruit size. Here's hoping for 'normal' summer and fall weather and a good-quality apple crop.

Understanding and Preventing Lenticel Breakdown in Apples: from Tree to Storage

Isabella Lora B.S. Student & Macarena Farcuh, Ph.D., Assistant Professor and Extension Specialist mfarcuh@umd.edu

What is lenticel breakdown in Apple Fruits and what causes it?

Physiological disorders in apples are abnormalities that occur in the tissue during the pre-harvest and post-harvest periods, not caused by pests or pathogens. These physiological abnormalities drastically lower growth profitability because they make the fruit unmarketable.

Lenticel breakdown is a physiological disorder affecting apple skin around the lenticels (small lens-shaped natural openings in the cuticle of apples). It is the result of microcracks and abrasions that develop on the skin layer of apples preharvest. Lenticels appear as slightly sunken blotches that result in underlying tissue drying out and becoming brown and spongy (Fig. 1). Symptoms of lenticel breakdown appear as dark brown/ black pits concentrated in multiple areas on the skin (Fig 1 and Fig. 2) that may increase in depth and diameter during postharvest storage and might even combine. Lenticel breakdown is mainly seen on the side of the apple that is exposed to sunlight rather than the shaded side. Direct exposure to sunlight weakens the lenticels and increases their susceptibility to injury and breakdown. Generally, this disorder will develop after a few days of storage, as limited reports are indicating its incidence before packing.

Figure 1. Honeycrisp apple affected by lenticel breakdown on the skin. Photo: Dr. Randy Beaudry, Good Fruit Grower.

What factors cause or contribute to apple lenticel breakdown development?

Genetics – Cultivar susceptibility: Because of the sensitivity and structure of their lenticels, some apple cultivars are genetically susceptible to lenticel breakdown, which makes them more vulnerable to the incidence of the disorder. Lenticel breakdown is typically seen in Honeycrisp (Fig. 1), Gala (Fig. 2), Golden Delicious, Fuji, Braeburn, and Ambrosia. For example, in the case of Honeycrisp, its large lenticels and thin skin, make it more prone to lenticel breakdown, while Gala apples are known to have delicate skin and sensitivity to environmental factors, increasing their risk of developing the disorder.

Figure 2. Gala apple with large dark brown spots indicating moderate symptoms of lenticel breakdown. Photo: Washington State University.

Fruit Maturity at Harvest: Delaying apple harvests can be tempting, especially to help improve fruit color and size for increased market appeal. However, this approach can negatively impact fruit quality and increase physiological disorder development. Because the natural ripening hormone ethylene will increase as fruit ripens on the tree, the fruit will become softer and more vulnerable to lenticel breakdown while being stored. This softness will increase the likelihood of breakdown by making the skin more susceptible to microcracks around the lenticels in environments with varying humidity. Delaying harvesting may cause the apple's cell walls to lose some of its structural integrity, leaving the skin more vulnerable to bruising and abrasions during handling and transportation.

Pre-harvest management factors: Regarding nutrition, it is important to consider that calcium plays a crucial role in stabilizing the cell wall of apples, which directly affects the integrity of the fruit's tissue. Microcracks and abrasions caused by irregular water supply, high humidity, and low wind (poor air circulation) can increase the incidence of lenticel breakdown. Furthermore, unbalanced nutrition with high potassium and magnesium to calcium (K+Mg):Ca ratios and high nitrogen to calcium (N:Ca) ratios can also increase susceptibility. Regarding fruit size, it has been reported that smaller fruits are generally at a lower risk and larger fruits are more susceptible. It is important to consider that excessive pruning can result in uneven fruit exposure and variations in the moisture content of the apple's surface. These variations may cause stress to the fruit, harming the lenticels and increasing the risk of lenticel breakdown in apples. Inadequate pruning can potentially worsen the problem by reducing ventilation and raising the humidity level around the fruit.

Environmental Factors: Rapid temperature changes can have a big effect on apple growth and can raise the possibility of lenticel breakdown, especially in hot weather. Temperature increases above 77°F (25°C) can put physiological stress on apple trees. This can cause apples to mature too quickly and reduce the quality of the fruit increasing the possibility of microcracks and thus of the occurrence of the disorder. Uneven water retention in apples can result from variations in water supply, which can be caused by irregular irrigation techniques or sudden downpours, as it generally occurs during the hot and humid summers of the Mid-Atlantic. On the exterior of the fruit, these quick shifts in water supply cause internal pressure that results in microcracks. Additionally, low wind conditions combined with high humidity levels might make this problem worse as water will tend to build up on the skin of the apple due to improper evaporation caused by a lack of air circulation. The possibility of tissue stress and abrasion development is increased by this extra moisture in conjunction with an inconsistent water supply.

Post-Harvest Management Factors: Fruit ripening can be accelerated, and fruit quality may eventually be compromised by delaying cold storage, thus increasing the development of lenticel breakdown. Additionally, apples can become stressed during postharvest with sudden temperature changes. Thermal shock can occur when cold apples are packed alongside warm ones or if they’re submerged in hot water. This can weaken the skin and increase the possibility of microcracking and lenticel breakdown. Furthermore, fluctuations in humidity during storage can also increase the development of the disorder, thus these should be monitored constantly. Ideally, a humidity of 90-95% should be maintained. Adequate ventilation is of uttermost importance to avoid ethylene build-up during storage and maintain adequate carbon dioxide and oxygen levels.

Research suggests that carbon dioxide levels should be kept below 1% to reduce lenticel damage, and oxygen should be maintained around 2-3% to promote normal respiration and avoid anaerobic (limited oxygen) conditions that may increase susceptibility to this disorder. By keeping these gasses within ideal ranges, adequate ventilation will lower physiological stress and maintain fruit integrity. Poor handling, temperature changes, or months of storage can worsen this problem and cause more obvious abnormalities and more breakdown of tissue.

What are the practices that can be implemented to reduce apple lenticel breakdown development?

Ensuring balanced tree vigor through pruning and thinning will minimize the stress on the fruit and help in reducing lenticel damage. Balancing nutrition and maintaining an adequate crop load as well as a regular water supply will also decrease disorder development. Avoiding delayed harvests as well as avoiding delaying cooling in storage, can help guarantee that the fruit maintains its quality, increasing its marketability and reducing the likelihood of post-harvest problems. Ethylene management, through the use of SmartFresh (1-methycyclopropene, Agrofresh, US), which blocks ethylene perception, can delay the ripening process, lower ethylene production, and decrease the incidence of lenticel breakdown. Utilizing controlled atmosphere (CA) storage will help minimize respiration and ethylene formation by maintaining high carbon dioxide levels (1-3%) and low oxygen levels (1-2%), to prevent lenticel breakdown. Maintaining consistent temperature and humidity levels in storage is crucial for reducing moisture-related stress, which can worsen lenticel breakdown. Enough ventilation keeps the fruit cold throughout and prevents hotspots, which hastens aging. Finally, be mindful of the genetic background of the cultivar you are working with as they vary in disorder susceptibility.

Newsletter Feedback Survey. Please Tell Us How We Are Doing!

We have created a short survey to help determine the effectiveness of the format and content of the UME Fruit and Vegetable Newsletter. All information is anonymous. Participation in this survey is entirely voluntary, and you may choose to skip any questions that you do not feel comfortable answering. The survey should take approximately 10 minutes to complete.

Survey Link: https://go.umd.edu/VFNS25

If you have any questions about the survey or for a paper copy please contact Emily Zobel (410)228-8800, or ezobel@umd.edu

We greatly value your input. With your feedback, UME will be better able to provide educational programs and services that meet your needs.

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.* This institution is an equal opportunity provider.

- **IPM Webinar Series: Pamaranth and pigweed control** - Dr. Kurt M. Vollmer, University of Maryland Extension Specialist-Weed Management June 26. 12-1 pm.
  Additional information and registration can be found at **go.umd.edu/ipmwebinar**

- **2025 Maryland Weed Management Twilight Tour. June 25th**, 2025, 4:00 PM to 6:00 PM at the UMD Wye Research and Education Center (211 Farm Lane Queenstown, MD 21658). Pesticide and CCA credits available. This event is free and open to the public This event will be held rain or shine and dinner will be provided. Additional information and registration can be found at **go.umd.edu/2025weedtwilight**
  If you need a reasonable accommodation to participate in this event or activity please contact us on or before June 20, 2025 at 410-827-8056 x135.

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Header photo By E. Remberg

Fruit & Vegetable News is published by the University of Maryland Extension, Agriculture & Food Systems Team.

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