

PENNSYLVANIA
VEGETABLE GROWERS

NEWS

for the commercial vegetable, potato and berry grower

PVGA

Volume 48/Issue 4



Cover photos provided by Art King | Harvest Valley Farms



Pennsylvania Vegetable Growers Association

An association of vegetable,
potato and berry growers.

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President's Message | *Peter Flynn | President*

Feeding Our Neighbors, Feeding the World — Finding Our Path in Pennsylvania Vegetable Farming

As I reflect on conversations with local growers here in Lancaster County, I am reminded of the unique challenges and opportunities facing vegetable producers in Pennsylvania. Recently, a farmer asked me about expanding into larger retail markets — selling to large chain stores. Having watched how these chains operate, I shared my perspective: these retailers often use produce as a loss leader during the season, buying from local farms, selling below cost, to drive store traffic. This practice makes it difficult for small or mid-sized local growers to sell to anyone at a profit.

Meanwhile, a recent West Chester Daily Local News article titled “Regenerative Farming — So What’s in Your Yogurt?” by columnist Mary Brown highlighted a northern Pennsylvania farm producing skyr yogurt with a litany of buzzwords: USDA certified organic, pasture-raised,

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COVER PHOTO CORRECTION

The Issue 3 cover photos were not provided by Art King of Harvest Valley Farms, but we actually part of an article included in Issue 4, Best Success with Peppers and provided by Steve Bogash. We apologize for this error and any confusion it may have caused.

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Our Mission

PVGA serves Pennsylvania's vegetable, potato, and berry growers
through education, research, advocacy, and promotion.

Our Vision

PVGA is the driving force in ensuring the future viability of the
vegetable, potato, and berry industries in Pennsylvania.

*Inquiries about membership, this publication or advertising rates
should be directed to PVGA at the above address.*

non-GMO, antibiotic-free, hormone-free, chemical-free, regenerative, and even integrating traditional ecological knowledge (TEK). As a farmer, I appreciate the sentiment — but it made me think about how all these words pollinate the marketing field as effectively as honeybees on strawberries.

I was also reminded of Will Harris of White Oak Pastures in Bluffton, Georgia, who transitioned from conventional commercial meat production to a pasture-based system. In the short documentary *One Hundred Thousand Beating Hearts*, produced by Arizona State University, Harris recalls his neighbor telling him he'd never feed the world that way. Harris replied, "I'm not trying to feed the world. I'm trying to feed my neighbors." Gabe Brown, the North Dakota regenerative farmer and author of *"Dirt to Soil"*, echoes that idea, and both men sell at a premium because their customers believe in what they do.

That is worth celebrating. But I also think we need to remember that these "buzzword" systems alone will not feed the world but, only the privileged who can afford the added costs.. The one that intrigued me the most is traditional ecological knowledge — TEK — drawn from indigenous agriculture. The oldest corn yield statistics I could find go back to around the 1860s, averaging about 20 bushels per acre. Today, the U.S. national average is over 170 bushels per acre. Clearly, modern agronomy has delivered incredible gains.

Still, there is wisdom to be drawn from TEK. We know, for example, that no-till methods — a practice rooted in traditional soil stewardship — often outperform conventional tillage over time. Recent data shows that conventional tillage corn yields can average around 134 bushels per acre, while no-till systems have averaged 160 bushels per acre. There is much to learn from these traditional methods — but they must be adapted to the realities of today's food system.

Another challenge for local organic production is our climate. In the arid West, where humidity is low, pests and weeds are more manageable. That makes large-scale organic production possible in those climates, while here in Pennsylvania, high humidity creates significant insect and weed pressures. Organic growing on the East Coast is closer to major markets, but the environment often makes it harder to be profitable without substantial inputs and risk.

We should also think hard about how large grocery chains market "local" produce as a loss leader. This practice can undercut the value of our products and challenge our ability to compete, which, arguably, is the whole point. Unless growers work together through co-ops or find direct-to-consumer markets, it will remain difficult to sustain fair pricing.

In the end, every farm is different. We must choose what is best for our land, our families, and our communities. No-till is well suited for grains and beans but not always for vegetables. And while reading about regenerative agriculture in articles written by non-farmers can be frustrating, let's remember most farmers are already working hard to optimize fertilizer use, minimize pesticides, and conserve resources to stay profitable — practices that often align with regenerative goals, even if they go by a different name.

We can learn from the past and from our peers, grow our businesses through what we learn at conferences and twilight meetings, and continue to adapt. We must grow to our values — but we also must grow profitably. That is the real measure of a sustainable farm, whether we're feeding the world, or just feeding our neighbors.

Pete Flynn
PVGA President

PVGA Wants to Showcase YOUR Farm!

- **Twilight Meetings** – PVGA is looking for additional Pennsylvania locations to host twilight meetings. These on-farm gatherings offer a unique chance for growers to experience the thriving operations of their peers up close and personal, all while the season is in full swing. Would you like your farm to be the location for an evening of insightful exchanges, where fellow growers can connect, share knowledge, and discover innovative practices in a relaxed and inspiring setting?
- **Articles and Photos** – We invite you to showcase your expertise and passion in the Pennsylvania Vegetable Growers News! We want to hear your dialogue through personal articles and photos that we can include in our printed newsletter. Whether it's sharing your unique stories, detailing your work journeys, offering insights from your experience in the industry, or your favorite recipe, your contributions will enrich our community and inspire fellow growers.

We look forward to hearing from you! Contact us at pvga@pvga.org



You are Invited

PVGA Twilight Meeting



Visit a fellow grower's farm



Kaelin Farm



Wed, August 20, 2025



6:00-8:00 pm



990 Prospect Rd
Evans City, PA 16033

RSVP | While walk-ins are welcome,
pre-registration is encouraged

Email | pvga@pvga.org

Phone | 717-973-5915

Matt Kaelin will take us around the farm and talk about some of the practices he and his family are implementing to serve the Pittsburgh region. The home-built fence tensioner and installer was very useful this past year in helping Matt get deer fence up and will be on display. Heather Grab, the new entomologist with Penn State, will be joining the twilight to answer questions and offer insights on monitoring for insect pests of sweet corn. The Kaelin farm will be one of Western Pennsylvania's trapping locations this year, so you can also learn more about how corn earworm is trapped and monitored.

Questions? Contact Glen Bupp at
gbb5154@psu.edu

Dr. M. D. Orzolek | Prof. Emeritus Vegetables | The Pennsylvania State University

HORTICULTURAL Observations



Plant Growth – How it Works

Plant growth from a seed initiates from germination with radicle emergence, the young root - the brain of the plant - Starts to assimilate both nutrients and water to supply the vegetative cells expanding above ground below the roots that start building structure. As long as the root(s) stay healthy, both water and nutrients are supplied to both phloem and xylem for distribution within the developing plant. At this point, leaves are developing which start to photosynthesize and produce 6 carbon sugars as well as proteins and enzymes. Once the plant reaches juvenility, flower initiation begins and reproductive structures will be

formed including mature flowers, fruits and vegetables. Maximum yield potential for that plant is only possible if plant stress has been minimal or mitigated.

So far in 2025, there have been more rainy days than sunny days and lately temperatures have been 15 F below normal for this time of year. Unfortunately, the current weather conditions favor weed seed germination and growth as well as some plant diseases. Hopefully, weather conditions will improve reducing stress on plants and encouraging maximum yield potential.

Growers Classified

PVGA offers a classified service to vegetable, potato, and berry growers. Classified ads for used equipment or surplus supplies will be published at no cost in a Growers Classified section.

The ads will be published on the PVGA website, in the email update, and in the printed newsletter

Ads will be restricted to equipment or supplies specific to vegetable, potato, and berry production, not general farm equipment. Other such free classified sections are available in publications like Lancaster Farming, but this is designed to focus specifically on items of interest to our growers. Businesses that commercially sell equipment or supplies will not be able to advertise for free.

There are several ways to place a classified ad

- Email to pvga@pvga.org
- Mail to PVGA | 908 N 2nd St, Harrisburg, PA 17102
- Fax to 717-236-2046

FOR SALE

**30 x 148 Greenhouse
\$3,000**

- Dismantled and on a wagon
- Purchased from Nolt's
- Includes most of the baseboards and end boards

Contact Art King at [724-816-0853](tel:724-816-0853)
or kings5@consolidated.net

CLASSIFIED

Best Success with Peppers

Steve Bogash | Steve Bogash Consulting

Transplanted peppers require some special handling to get the most out of them. Here are some of what I believe to be the most important practices to get the most out of this crop.

-Old transplants that are in bloom or worse, carrying small fruit, will never develop into the robust plants needed to carry large yields. Removing flowers and fruit can help a little, but these plants seldom produce well. Bell pepper transplants are generally at their best 5-7 weeks post emergence. As soon as the transplant plugs are tight enough to be handled for transplanting, they are ready to go to the greenhouse, tunnel, or field. Yes, small transplants that are just ready to transplant are far superior to large, older transplants! Be sure to harden off transplants for a few days once they come out of the greenhouse.

- Only plant peppers when the soil temperature is 65F or above. At lower temperatures the roots do not grow but will readily rot.
- Pepper plant stems do not tolerate touching black plastic mulch at transplanting, especially during hot weather, and will burn readily upon contact on a sunny day. Tender transplants that touch the plastic are also much more likely to dampen off.
- Peppers are very susceptible to *Phytophthora*, so running a proactive fungicide program can make a significant difference in the overall return on investment from a field. Drench transplants with a biological root inoculant such as RootShield® Plus, or Actinovate® AG. Including Stargus® at transplanting can boost management of multiple soil diseases. Combining bio inoculants can enhance overall disease resistance. Consult your suppliers' technical representative for information on effective combinations.
- 'Box tying' peppers works especially well when plants are grown on a double diagonal row. This is a great way to use last year's wooden tomato stakes. Tying them up prevents wind damage and goes a long way to preventing sunscald that we often see in unsupported peppers after a summer thunderstorm knocks them down. Box tying peppers also makes so much sense in limiting harvest damage to what are often very brittle plants.
- Consider including Silicon (Si) nutrients in your drip irrigation program to further strengthen pepper stems. Many Si products are not tank-mix friendly with other nutrients (mostly for pH issues), so jar test any



Box-tied peppers in a high tunnel at the Penn State SE Research Farm.

combinations, then test that solution on a few plants before treating the whole planting block. Literature about the benefits of Si continues to increase, so maybe it's time to see what all the fuss is about.

- Removing that first fruit that forms in the top of bell pepper plants is often a very worthwhile use of time and labor. This fruit, when it matures, can be hard to pick without damaging it or the plant. Knock them off as soon as you can see the developing fruit. This minor delay in harvesting the earliest fruit is more than worthwhile in plants that are less beaten up from harvesting this fruit later in the season.
- In the NE, it is significantly easier to get greater yields of beautifully colored bell peppers in high tunnels and greenhouses vs. field grown. Fruit rots increase rapidly in field grown bells as they ripen beyond green.
- High tunnel bell peppers benefit from some shade during the peak of summer sun intensity. Install 30-40% shade fabric by early June and remove it around the end of August. You may have to experiment a little on your site as to the ideal degree of shade as that can be site specific as well as the best dates to install and remove the fabric.
- Consider 'bullhorn' type peppers for field-grown, fully colored, sweet peppers. They are generally very

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disease resistant and produce beautifully colored, sweet peppers in the field. These bullhorn types are often fully colored long before the first bell peppers. Tread carefully in adopting these peppers as they are not nearly as common in vegetable markets.

- Bell peppers are prone to sunscald. Box tying so they don't fall over helps a lot. Consider the proactive use of anti-sunscald agents to eliminate this issue. Our hotter summers have really driven the need for these applications. Haven® and glycine betaine-based products like LALSTIM OSMO® can significantly reduce sunscald and do not leave a white residue. Both products also increase transpiration which can improve the uptake of calcium, magnesium, and potassium which can improve fruit quality.
- Peppers are heavy feeders and will benefit from high K, Ca, & Mg programs at fruit set like tomatoes.
- Include Regalia® at 1 qt / 100 gallons in the transplant water to get your plant root systems off to the best start. This will improve overall health and stimulate root growth. For smaller uses such as high tunnels, drench at 10 ml / gallon immediately after transplanting. Starter nutrients can and should be included in this drench.
- Plasticulture peppers often benefit from two irrigation lines. This is especially so with double rows. On a 15" x 15" or 18" x 18" spacing the distance from a plant to a single line down the center can reduce irrigation efficacy and stress transplants and heavily fruiting plants on hot, sunny days with the wind blowing.
- Begin tissue or sap testing peppers at 4-5 weeks post-transplant. This first test is essential in determining the quality of the earliest peppers and making sure that there are sufficient nutrients to keep plants growing aggressively. Switch from a balanced fertilizer like



20-20-20 or 20-10-20 to a low N, high K blend at this time, then adjust as needed based on your test results.

- Peppers are susceptible to bacterial spot which will express on leaves and fruit. Begin with hot water treated seed (meticulously follow the instructions in the Ohio State Extension Bulletin HYG-3085-05, Hot Water and Chlorine Treatment of Vegetable Seeds to Eradicate Bacterial Plant Pathogens) for the best results. At transplanting begin a proactive disease management program using Regalia®, plus copper, plus mancozeb every 7-10 days to help keep your plants protected from both fungal and bacterial diseases. Factor the 5-day PHI for mancozeb into your application scheduling once harvesting.

Growers that follow these practices will harvest the highest quality peppers and the best returns on their investments in time and money.

Enjoying the Bite of Bitter Vegetables

Lori Klein, Ed.D., MPH, NDTR |
Penn State Extension Educator –
Food, Families, and Communities

Learn to love the intense flavor and bitter bite that some vegetables have.

Bitter vegetables tend to be those that many consider to have strong or “harsh” flavors and come in a variety of forms. Leafy greens such as spinach, kale, and dandelion greens are a tasty addition to a variety of soups. Similarly, a salad of spring mix often includes tender bitter greens (such as arugula, radicchio, and endive) that are delicious when served with a vinaigrette. Shredded red and green cabbage made into a colorful slaw can be a delicious topping for fish tacos. Sliced radishes and scallions, too, can add an extra tang to many dishes. Asparagus, broccoli, and Brussels sprouts can be grilled, roasted, or steamed as a side dish.

What if you or someone in your family dislikes the intense flavors of these veggies, though? There may be a scientific explanation for this. There are genetic differences in how people process taste (Bray & Carek, 2020). Being offered bitter vegetables during childhood can result in a lifelong enjoyment of them. On the other hand, for others, bitter flavors remain strong and off-putting throughout their lives. Alternatively, other people’s taste buds change over time, and they learn to love a bitter bite as they age. The bottom line is that there may be hope for the spinach “haters”—which is important because eating more vegetables contributes to our overall good health.

Cook to Soften Harsh Flavors

If the last time you tried a Brussels sprout, it was boiled and unappetizing, maybe it is time to prepare it in a different way. Seasoning and roasting Brussels



Credit: Ekaterina Bratova / [bigstockphoto.com](https://www.bigstockphoto.com)

sprouts in the oven or air fryer gives them a caramelized flavor and surprising appeal. Indeed, this cooking method has changed the minds of many doubters!

When you cook vegetables, the intense flavors may mellow and complement other foods within a meal. Similarly, sautéed or roasted radishes become sweeter and taste more like a potato or cooked turnip. You can even elevate the simple cooked radish with a spritz of lemon juice or vinegar and some chopped fresh herbs and scallions.

Asparagus, on the other hand, is a bit more delicate. Cook it briefly to keep it tender-crisp. The exact cooking time depends on the thickness of the stalk and whether you steam, roast, grill, or sauté it. Whichever preparation you choose,

consider adding no-salt lemon pepper seasoning at the end to brighten the asparagus’s flavor and add a little zing.

Combine with Other Flavors

Like other bitter vegetables, the intensity of leafier spinach, kale, and dandelion greens softens when these veggies are cooked, and they can then be used to transform an otherwise bland dish. You can easily add greens to eggs (in a quiche), potatoes (such as in colcannon, an Irish mashed potato recipe), and pasta dishes for added nutrition and a balanced taste. Even consider adding a little extra tang by using tomato sauce or citrus. For example, plain scrambled eggs become much more flavorful with the addition of sautéed kale and a spoonful of tomato sauce.

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Entrée salads are a great way to incorporate bitter vegetables and put a new twist on leftovers. You can create them by topping leafy greens with whole grains and protein foods, such as tuna, roasted chicken, beans, and nuts or seeds. Whole grains like brown rice or quinoa also add a nutty flavor.

If raw spinach is too strong for your taste buds, try blending it with frozen fruit and milk for a delicious smoothie. Starting with a two-part fruit to one-part greens ratio will give you a sweeter smoothie, and you can gradually increase the greens as you adjust to a more robust flavor. Strawberries complement and add natural sweetness to spinach greens.

Serve with a Dip or Sauce

Both children and adults are more likely to try out a new vegetable if it is served with a sauce or dip (Bray & Carek, 2020). Often, though, dips, sauces, and salad dressings

are high in fat and weigh down the vegetables. Simply incorporate healthy fats to keep the focus on nutrients. For example, try a Greek yogurt-based ranch dip or creamy guacamole with broccoli and radishes. Or try a lemon vinaigrette sauce over roasted asparagus or leafy greens.

Recognize the Health Benefits

Try at least one of these ideas to add a strong flavorful vegetable to your meals, because they really are delicious once your taste buds adapt. And Popeye wasn't the only one to know how important "eating your spinach" was to being strong. Bitter vegetables have nutritional benefits that protect against cancer and cell damage (Yan, 2023). Like all bitter vegetables, spinach and its leafy cousins are nutritional powerhouses and good sources of vitamins A, C, E, and K, as well as folate, potassium, calcium, and iron. These vegetables are also rich in fiber, which is deficient in

many diets, and can prevent certain cancers and promote gut health.

If bitter vegetables are a hard sell to you or your family, remember that we often have to try new foods multiple times before we develop a taste for them.

References

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PA Growers with High Tunnel Tomatoes, Strawberries, and Cucurbits Needed for Survey

Lauren Hendricks, a master's student in the Plant Pathology department at Penn State is surveying soilborne pathogens and needs soil samples from high tunnel tomato, strawberry, or cucurbit plantings to assess the amount of *Fusarium oxysporum* found there. *Fusarium oxysporum* is the cause of Fusarium wilt in tomatoes and cucurbits, and certain strains can even attack strawberries. If there is a better understanding of which races of *Fusarium oxysporum* are already present on grower farms, they will be better able to develop recommendations for its management. Lauren will provide cooperating farmers with a summary of findings for your farm. If you are interested in participating or have any questions, reach out to Lauren at lfh5189@psu.edu, 717-712-5284 (cell) or 814-863-7217 (fax). Your assistance is appreciated!



Function of Plant Growth Regulators (PGR's) in Plants

Dr. M. D. Orzolek | Prof. Emeritus Vegetables | The Pennsylvania State University

There have been many new supplemental and nutritional materials appearing on the commercial market in the last 3 years. Some have plant growth regulators as active ingredients in their composition. Below is a table of current Plant Growth Regulators naturally occurring in horticultural crops and their function in the plant.

PGR	Where produced or found	Major functions in the plant
Auxin (IAA)	Embryo of seed, meristems of Apical buds and young leaves	Stimulates stem elongation (low con concentration only), root growth, cell differentiation, and branching; Regulates development of fruit; Enhances apical dominance; functions In phototropism + gravitropism; Promotes xylem differentiation; retards leaf abscission.
Cytokinins	Synthesized in roots and transported to other organs	Affect root growth and differentiation; stimulate cell division and growth; stimulate germination; delay plant senescence.
Gibberellins	Meristems of apical buds and roots, young leaves, embryo	Promote seed and bud germination, stem elongation, and leaf growth; Stimulate flowering and development of fruit; affect root growth and differentiation.
Brassinosteroids	Seeds, fruit, shoots, leaves, and floral buds	Inhibit root growth; retard leaf abscission; promote xylem differentiation.
Abscisic Acid	Leafs, stems, roots, green fruit	Inhibits growth; closes stomata during Water stress; promotes seed dormancy
Ethylene	Tissues of ripening fruit, nodes of stems, aging leaves and flowers.	Promotes fruit ripening, opposes some Auxin effects; promotes or inhibits growth and development of roots, leaves, and flowers, depending on species.

From: Experiments in Plant Physiology by Carol Reiss, Cornell University 2005 Pearson Education, Inc. published as Benjamin Cummings.



Mowing Rye

Harvest Valley Farms

Mowing down the rye like this is not something we usually do. Usually we disc it down, just to get it on the ground, then we seed sudan grass through it. The plan with this field, however, is to bale the rye straw into large round bales and use it to mulch between the rows of plastic in other fields. This was a field that we had fall squash in last year. The rye was 6' tall. It should make a lot of bales.

Growing the Best Vegetables and Small Fruit:

pH and Water Quality Matters

Steve Bogash | Penn State Extension and ProFarm (retired)

Tim Elkner | Penn State Extension Horticulture

As we look around at ways to improve produce production, yield and quality, one area that offers the greatest return in both fruit quality and reduced fertilizer inputs is in getting the pH of your irrigation solution correct. Every crop has an ideal pH range where it can best remove nutrients from the soil solution. Getting your soil and water pH right can be the difference between a profitable crop and high field / packing house losses.

First you need to understand pH a bit to make any sense of this: pH is a logarithmic scale, therefore, even seemingly minor adjustments in the pH of a solution can have a major impact on nutrient uptake. *Note: 1 point on the pH scale is a ten-fold change, so a pH of 7 is ten times more alkaline than a pH of 6. A pH of 5 is 100 times more acidic than a pH of 7 (10×10). A pH of 4 is 1,000 times more acidic than a pH of 7 ($10 \times 10 \times 10$) and so on.* Since tomatoes are the number one dollar per acre crop in PA, this crop will be used as an example for this article.

Tomatoes (peppers and eggplant too) prefer a soil solution pH of 6.2-6.5. That range provides the maximum uptake of nutrients, so whatever fertilizer you provide is likely to be used by healthy plants. As the soil solution pH moves above that range, it becomes increasingly difficult for tomatoes to extract potassium, even if plenty is present. Yellow Shoulders, Gray Wall, Internal White Core..... are all nutrient-driven disorders that result from insufficient potassium at fruit set. If a fruit is set with insufficient potassium, no amount applied later will fix that fruit. In addition, Blossom End Rot and Cracking, while largely Ca/Mg disorders, are part of this picture since getting the nutrients calcium, magnesium, and potassium, all in the correct proportions into tomatoes, reduces or eliminates virtually all common nutrient disorders. A grower cannot get the proportions of these nutrients correct without first addressing the pH of the soil solution. Growers have been able to reduce potassium applications substantially and still get improved pack outs by simply getting their irrigation water and fertigation solution pH to 6.2-6.5.

Throughout much of Pennsylvania and the Mid-Atlantic, our well, spring, and surface waters source from limestone-based aquifers. These waters typically have high pH and alkalinity, which for the purpose of growing the best tomatoes, is any pH above 6.5. pH is the relative acidity or alkalinity where 7 is considered neutral and

anything below that is acid and above that is alkaline. Alkalinity is measured as the bicarbonate content of water (typically CaCO_3) and is most easily understood as the resistance to changing the pH of a solution. For example - it takes very little acid to neutralize a solution with a pH of 7.8 (relatively alkaline) and an alkalinity of 120 ppm CaCO_3 while it will take a lot more acid to neutralize a solution with a pH of 7.5 and an alkalinity of 350 ppm CaCO_3 . The higher the alkalinity value, the more acid will be needed to neutralize the solution. Alkalinity and pH are related but are not the same.

Before a prescription for acid application can be created, your water supply needs to be tested for both pH and alkalinity. Always specify to your laboratory that you need the alkalinity value in 'ppm bicarbonate' as many labs are also testing home water for the calibration of water softeners where grains per gallon is the measurement.

If you are an organic grower, then you will probably be using powdered citric acid to reduce the pH of your irrigation water. It takes about 7-9 ounces of powdered citric acid per 100 gallons of water to reduce most well water by one point on the pH scale. Tom McCarty, Retired Extension Water Quality Educator, Penn State Extension, did extensive experiments with well water collected from sites all over Central PA and found that this formula worked most of the time. Use a two-point calibrated pH meter to refine any acid application. Concentrated vinegar is also allowed under organic standards, but that is probably substantially more expensive and harder to handle due to the weight in handling so much liquid versus powdered citric acid.

Most conventional growers use either 35% or 93-96% sulfuric acid for pH reduction. The 93-96% is readily available from greenhouse suppliers in one-gallon jugs and was available from chemical suppliers in carboys and totes. However, due to illegal drug operations using it as an ingredient, it has become hard to easily purchase large supplies of this higher percentage. 35% sulfuric acid has become the standard for most farm irrigation systems. In order to determine your dose, enter your present irrigation water source pH and alkalinity in ppm along with your target pH into the UNH AlkCalc at http://extension.unh.edu/Agric/AGGHFL/alk_calc.cfm. Pay careful attention to the units in the pull-down menus when entering values or the program will return nonsense numbers.

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The acid recommendations provided by AlkCalc and the citric acid value provided earlier in this article are good starting points. In order to refine your specific acid dosage, you will need to use a digital pH meter that is temperature compensating and uses a two-point calibration. We generally work in the lower end of the pH range, so use pH 4 and 7 calibration solutions. Wire prong meters and litmus paper are not nearly accurate enough to adjust an acid dose rate. Good pH meters use a porous glass bulb sensor that allows hydrogen ions to move through, then compares your water hydrogen ion concentration to that of a reference electrode in the sensor.

A pH meter as described will cost between \$75 and \$200 with better meters on the higher end of this range. Make this a useful purchase by following all directions for use, calibration and storage between uses. Be sure to remove the batteries at the end of the growing season and repurchase calibration solutions at least yearly. Check with your local greenhouse or vegetable supply dealer or with catalog and online suppliers such as Ben Meadows, Forestry Suppliers, and Gemplers' for meters.

If your water requires acid to maintain an irrigation water pH of 6.2-6.5, then the best practice is to run your proportional injectors (Dosatron, Dosmatic, Chemilyzer) in a series with acid as the first station that always runs.

This provides a constant supply of adjusted water to the root zone. When fertigating, it is likely that the dose of acid will need to be adjusted as every fertilizer has some degree of acidifying or alkalizing potential. Use your calibrated pH meter to adjust the concentration of acid based on the output from the injectors. Your acid injector will probably need to be rebuilt at least annually to maintain an accurate dose rate. Most regular proportional injectors designed for soluble nutrients can be used with the rates of sulfuric acid and citric acid as described in this article.

Greenhouse and high tunnel grown produce are usually the first to receive pH and alkalinity correction due to the high crop value. However, field grown tomatoes and peppers can also benefit from water treatment. Due to the amount of water and acid needed for large areas, acid-safe and peristaltic pumps are often better suited for field use. Work with a specialist that has a background in field irrigation to get the best system for your farm.

The greater the range between your current irrigation water pH and ideal values, the more you'll see a difference from improved production and return on your investment through these practices. You'll pick fewer cull tomatoes and have a significantly easier time sorting and packing. Sounds like a great plan.

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Snyder County Farm Hosts Twilight Meeting

Leah Fronk | Penn State Extension | Horticulture Educator | Juniata County

On Thursday, June 26 approximately 35 growers met at the farm of Carl Wenger in Snyder County for a PVGA sponsored twilight meeting. Attendees walked the vegetable fields and discussed many current issues. Extension personnel Tom Butzler, Leah Fronk, and Heather Grab were also in attendance. The first stop was the grafted watermelons. Some in attendance use grafted plants every year, and some have not tried them yet. With grafted plants, growers help to gain an edge on fields affected by soilborne disease and other stressors and produce higher quality fruit compared to standard plants. Despite the rainy weather in June, the 'Mountain Fresh' tomato crop appeared free of disease. A discussion on commonly used tomato varieties interested many in attendance. Attendees debated the balance when choosing varieties based on disease resistance and flavor.

The next stop in the field was the zucchini plants. Penn State entomologist Heather Grab discussed cucumber beetle and squash bug management. Both insects overwinter as adults at the edges of fields, though cucumber beetles emerge first. While cucumber beetles emerged a few weeks ago, squash bugs are emerging now and laying coppery-colored eggs on the undersides of leaves, which attendees were able to observe during the walk. 'Candy' onions are grown on black plastic at the Wenger farm. A few onions appeared to have center rot, a bacterial pathogen that causes leaves in the center of the plant to become water-soaked and soft. The group discussed management options such as copper, early harvest, and length of neck for affected plants. Pumpkins are grown on the Wenger farm and while the group did not walk to the pumpkin field, there was a good discussion about *Phytophthora*. Many growers in attendance have experienced losing cucurbit crops to *Phytophthora* in recent years. Management options discussed included irrigation practices, field drainage, equipment sanitation, nitrogen use and fungicides.

After the field walk, the group walked to a nearby schoolhouse to enjoy refreshments and listen to Joni Davis report about the Worker Protection Standard (WPS). The WPS is a regulation that aims to reduce pesticide poisoning and risk of injury to farm workers. Because of the WPS training and discussion in the field, attendees with their PA pesticide license were able to earn 2 category (PC, 03, 18) credits and 1 core credit.

This Twilight meeting was organized by Leah Fronk, a commercial horticulture Extension Educator based in



Juniata County. Her programming focuses on organic and conventional pest management for vegetable and small fruit crops, as well as assisting growers with issues related to pesticide certification and the Food Safety Modernization Act (FSMA).

PVGA extend many thanks to Carl and his family for hosting this enjoyable twilight meeting, and to Leah for organizing the meeting!

Biodegradable Plastic Mulch: Where Do We Stand!

Dr. M. D. Orzolek | Prof. Emeritus Vegetables | The Pennsylvania State University

The use of plastic mulch for the production of vegetable crops in the United States has doubled in the last 20 years. While energy costs have risen dramatically in the last 5 years, plastic film manufacturers have saved money on the production of mulch film by reducing the thickness of the film. Film thickness has gradually gone from 1.5 mil to 0.5 to 0.7 mil in the last 10 years. The one disadvantage of the thin plastic film is the retrieval potential for growers after the crop has been harvested in the field. Thin films 0.7 mil or less do not re-trieve from the field very easily and thus difficult to recycle. A true biodegradable plastic mulch has been developed and is being sold commercially in Europe and also in North America. This new, innovative plastic film does truly biodegrade in the field and can be rototilled into the soil at the end of the season and at

a savings of at least \$100/A by not having to pick up and dispose of the plastic mulch at a landfill. Field research has demon-strated that the biodegradable mulches will produce equal marketable crop yields compared to non-degradable plastic mulch. Two issues that growers may be apprehensive about are the initial cost of the biodegradable mulch compared to non-degradable mulch and the sometimes unpredictability of the degradation rate of biodegradable mulch.

Vegetable growers in the Mid-Atlantic and the Northeast regions of the U.S. grow almost all of their warm season vegetable crops on plastic mulch to enhance early growth and total yield as well as minimize/eliminate weed problems in the row. Use of plastic mulch with raised beds and drip irrigation (environmental modification) enables growers in these re-gions

to extend their marketing seasons when commodity prices are higher or grow vegeta-bles in their plasticulture system that otherwise would not produce a crop when grown on bare ground/conventional production. If we examine plasticulture on the larger scale, the use of plastic film (mulch) in North America has increased approximately 5% per year since 2000. The increase in mulch film in part has been due to the dry to droughty weather in North America over the last 5 years. The plastic film reduces evapotranspiration rates and the total amount of water required to grow the crop.. The introduction of new colors of mulch by most of the manufacturers in North America has also contributed to the increase in mulch film use in the last 10 years. Many growers are now trying various colors with their vegetable crops including: red, blue, metallized silver, green IRT and brown IRT com-pared to standard black or co-extruded white/black. Current use of plastic film for the pro-duction of horticultural crops in North America is estimated at 600,000 acres per year. Use of plastic mulch has consistently increased the marketable fruit yield at harvest with a con-current reduction in cull fruit.

After removal of used polyethylene mulch films residual pesticides are still present, interim storage and final transportation adds to the complexity. Landfill disposal is under increased pressure due to limited landfill space along with escalating costs and increasing scrutiny on environmental impact of agriculture. Because landfill disposal and recycling are the most commonly employed means of disposal for polyethylene mulch films, natural biodegrada-tion of tilled-in, biodegradable films are an alternative for more efficient and easier farming practice.



Cherry Tomatoes

Harvest Valley Farms

It looks like we are going to have a great crop of cherry tomatoes in the high tunnel this year. This isn't all one cluster, it's actually 4 clusters all hanging the same way making it look like all one cluster. Either way, the yield is going to be phenomenal! We have already started picking them even though they are not ripe.

Mindfulness for a Healthy Heart

Lori Klein, Ed.D., MPH, NDTR | Penn State Extension Educator – Food, Families, and Communities

It turns out that there are ways we can foster heart health simply by slowing down and listening to our bodies.

You may have heard that mindfulness is good for your mental well-being, but did you know that this practice can also benefit your heart?

Mindfulness is commonly defined as noticing what is happening in the present moment without judgment. An example of practicing mindfulness in daily life can be a simple check-in during a hectic moment. You might ask yourself, “What is happening in my body right now?” and realize that you are holding your breath a bit, tensing your shoulders, or feeling nauseous.

Mindfulness does not require that you force yourself to change any of these feelings, simply that you become aware of them. Often, the simple act of recognizing them causes your body to adjust on its own. For example, just by you recognizing the symptoms of stress, your body may inadvertently relax the shoulders and take a deep, relaxing breath. You are now better able to handle the situation calmly. That is mindfulness in action.

All of that is well and good in moments of stress, you say, but how can mindfulness improve my long-term heart health? The answer is two-fold. First, reducing chronic stress in turn reduces the strain that stress puts on your heart. And second, mindful living causes you to be more present in all of your decisions, including what and how you choose to eat. And healthy eating leads to a healthier heart.

Mindfulness and Stress Reduction

While researchers have studied different types of mindfulness programs for a variety of health conditions, mindfulness has been shown to reduce

excess stress, something that can negatively impact our overall physical health.

As noted by The American Heart Association (n.d.), ongoing high stress can increase inflammation, high blood pressure, and irregularities in heart rhythm. So, it follows that when you can manage your stress—which mindfulness helps with— you may also be supporting your heart health.

If You Have Heart Disease

But what if you are already at risk? How can mindfulness help when you have high blood pressure, high cholesterol, or heart disease? Here, again, research shows that mindfulness can be a benefit. Li et al. (2024) examined the overall evidence for mindfulness in patients with coronary heart disease. The researchers found that mindfulness interventions significantly improved sleep quality, stress levels, and systolic blood pressure for patients. While results were inconclusive for other measures of

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Credit: victorflowerfly / [bigstockphoto.com](https://www.bigstockphoto.com)

heart health, mindfulness did make a positive impact, specifically on reducing blood pressure.

Additionally, people with heart-related health concerns frequently experience ongoing chronic stress because of their condition(s). As with any stressor, a mindful response provides an opportunity to pause, notice negative thoughts and emotions without judgment, and take a breath. Just as your condition shouldn't define you, it also shouldn't consume your thoughts. Here, again, mindfulness can make a difference.

Eating Mindfully

Another way you can use mindfulness in a heart-healthy lifestyle is by eating with purpose. When you stop to savor the taste of your food and when you pay attention to internal cues of hunger and fullness, you are eating in a mindful way. This, in turn, can lead to better weight management, which can reduce your cardiovascular risk factors.

The Dietary Approaches to Stop Hypertension (DASH) diet has, itself, already proven to prevent and reduce high blood pressure. But what happens when people practice mindfulness and follow the DASH diet? Are the results even more effective?

Researchers have been working to answer that question for the past couple of years. Loucks et al. (2023) shared ways that mindfulness might help people stick to the DASH eating plan and lower their blood pressure. An issue that sometimes arises with the DASH diet (and others, for that matter) is that people can get bored or frustrated with their results. Additionally, moments of high stress can cause people to stray from their eating plan and begin to "stress-eat." Loucks et al. suggest that when you pay attention to how you feel emotionally, you can better cope with these feelings and be less likely to reach for cookies or potato chips to soothe yourself.

So, did it work? The team concluded that a combination of the DASH diet and mindful eating practices may, in fact, improve eating patterns.

A Short Mindfulness Practice

One of the best things about mindfulness is that you can try it anywhere, anytime, without special equipment. There are a variety of online guided mindfulness meditations and apps if you prefer to have someone lead you. Or simply check in with yourself right now, wherever you are.

Here is an example of how to take a quick mindfulness moment.

First, find a quiet place to sit, and begin to calm your mind.

Then take stock of the sensations in specific parts of your body. For example, Today, in a sitting position, starting with my feet, I notice they are off-center and at awkward angles, and they will feel more grounded if I place them flat on the floor. Moving up my legs, I feel areas of tension that I can adjust by sitting a little more upright. This change supports a tall spine and helps me breathe more fully. I observe how my shoulders lift with each inhale and fall gently with each exhale. My mind centers on the area around my heart that moves with each breath, and I follow this pattern for 10 complete breaths.

In just a few minutes, you will likely feel more relaxed and calm.

Tip: Consider doing something like this the next time you are at a healthcare appointment, especially when you are waiting for them to check your blood pressure. If these are moments of stress for you, this can help ensure a reading that is more accurate to your actual number.

Final Thoughts

Is mindfulness a silver bullet for everything that ails you? Of course not. But can it be beneficial to your health, in particular, your heart health? Research and common sense seem to indicate that incorporating mindfulness into your regular health routine can absolutely lead to a healthier you.

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Nutrient Deficiency Symptoms in Vegetables

Dr. M. D. Orzolek | Prof. Emeritus Vegetables | The Pennsylvania State University

Both nutrient availability and nutrient balance play important roles in plant nutrition. Changing the level of one nutrient in the soil will often affect the uptake or transport within the plant of other nutrients. The effects of one nutritional element on the uptake or use of another nutritional element and the nutrient interactions within the plant can result in the expression of a nutrient deficiency in the plant. Nutrient interactions can be a significant factor in plant growth in the following ways: 1) when the levels of two nutrients are both near the deficiency range and 2) when one nutrient is supplied in excessive amounts while another nutrient is at a level considered only marginally sufficient. Nutrient interactions may be the result of precipitation reactions occurring in soil solution, which reduces availability for plant uptake or the result of competition during nutrient uptake, translocation or metabolic function within the plant. Examples of some important nutrient interactions include ammonium-calcium, phosphorus-iron, phosphorus-copper, phosphorus-zinc, and potassium-magnesium-calcium.

Nutrient Deficiency Symptoms

Nitrogen (N)

- Nitrogen is used in larger quantities than any other mineral element
- Most frequently deficient for normal growth of non-legumes
- Forms taken up by plants NO_3^- and NH_4^+
- Function in plants – 1) part of the amino acids which make up proteins and 2) part of the chlorophyll molecule
- Symptoms
- Plants become stunted and/or become yellow on the older leaves
- N is mobile in the plant so new leaves may remain green
- Excess N may delay plant/fruit maturity
- Excess vegetative growth will reduce reproductive growth (fruits). Excessive plant succulence may make a plant more susceptible to disease or insect attack.

Phosphorus (P)

- Forms taken up by plants H_2PO_4^- primary orthophosphate
- H_2PO_4^- secondary orthophosphate
- Functions in plants – 1) a part of the protein molecule, 2) necessary for transfer of energy during metabolic

processes (ATP) and 3) hastens maturity, promotes good root development, improves drought and cold tolerance, improves seedling vigor and important in seed and fruit formation.

- Symptoms
- Overall reduction in growth, stunting.
- Purple coloration on the underside of leaves, lower leaves first because P is mobile
- Delay in maturity
- Failure of seed to form

Potassium (K)

- It is used in larger amounts than any other element except N. May have luxury consumption – plants take up more than is needed. Located in the cell sap as an organic salt.
- Forms taken up by plants – K^+
- Functions in plants – 1) It is a catalyst in many reactions; carbohydrate, starch and N metabolism, 2) activation of enzymes involved in photosynthesis, and even protein and carbohydrate metabolism, 3) Adjustment of stomatal movement in leaves and water relations, 4) helps disease resistance and 5) increases quality of fruit and vegetables.
- Symptoms
- Tips and margins of leaves turn brown. K is mobile so this occurs first on lower leaves
- Causes fruit to ripen unevenly.

Calcium (Ca)

- Forms taken up by plant – Ca^{++}
- Functions in plants – 1) production of calcium pectate which gives strength to cell walls, 2) needed for peg development in peanuts and 3) required for plant root and tip elongation.
- Symptoms
- Ca is immobile so new growth is affected
- Failure of terminal buds to develop
- Symptoms are not usually seen under field conditions because other problems caused by acidity of soil will generally become limiting factors before Ca.
- Blossom End Rot in tomato is an exception to this generalization.

Magnesium (Mg)

- Forms taken up by plant – Mg^{++}

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- Functions in plants – 1) a part of the chlorophyll molecule - essential for photosynthesis, 2) Related to phosphorus metabolism, 3) Large quantities found in seeds.
- Symptoms
- Mg is mobile so symptoms occur first in lower leaves
- Interveinal chlorosis.
- Lower leaves of severely deficient plants become yellow-orange and areas of purple pigmentation may develop.

Sulfur (S)

- Forms taken up by plant – sulfate some SO_4^{2-} and sulfur dioxide through leaves.
- Functions in plants – 1) a component of 3 of the 21 amino acids – cystine, cysteine, methionine, 2) present in the organic compounds that give the characteristic odors of onion, garlic and mustard.
- Symptoms
- Uniformly chlorotic plants which are stunted and spindly. Similar to N deficiency symptoms. It is less mobile than N so deficiency may be more apparent on younger leaves.

Manganese (Mn)

- Forms taken up by plant – Mn^{++} , Mn^{+++} can be absorbed through the leaves. Required in small quantities. Large amounts are toxic (acid soils).
- Functions in plants – 1) Activation of enzyme systems and 2) Chlorophyll synthesis.
- Symptoms
- The younger leaves develop yellow streaks. Persistence of a uniformly dark green veinal network in the yellow leaves is characteristic of Mn deficiency and distinguishes it from Fe deficiency. Mn is immobile in plant.

Iron (Fe)

- Forms taken up by plant – Fe^{++} (ferrous form) and Fe^{+++} (ferric form) can be taken up by the leaves.
- Functions in plants – A catalyst in the production of chlorophyll and enzyme systems.
- Symptoms
- Leaves on top of plant become pale yellow, while the young mature leaves develop a mottled appearance. The young leaves become pale green and develop interveinal yellowing which spreads from the base towards the tip of the leaf. When the deficiency is not corrected, brown areas usually develop along and around the main veins. Youngest leaves may become almost white. Fe is immobile in the plant.

Copper (Cu)

- Forms taken up by plant – Cu^{+2} can be absorbed through the leaves. Very toxic if too much is applied.
- Functions in plants – Copper is a catalyst for chlorophyll formation.
- Symptoms
- Copper is immobile so upper or younger leaves affected – plants wilt and develop a bluish green cast.

Zinc (Zn)

- Forms taken up by plant – Zn^{+++} can be taken up through leaves. Toxic except in small quantities.
- Functions in plants – Activator of enzyme systems.
- Symptoms
- Zn is immobile – occurs in younger leaves first.
- Interveinal chlorosis followed by a reduction in rate of shoot growth and shortening of internodes (resetting).

Boron (B)

- Forms taken up by plant – H_3BO_3 can be taken up through the leaves. Can be very toxic if applied to some crops at rates not harmful to other crops. Deficiency occurs frequently on alfalfa. Rates of B applied to alfalfa may be toxic to small grains, peas and beans.
- Functions in plants – 1) translocation of sugars across membranes and 2) germination of pollen grains and growth of pollen tube.
- Symptoms
- Yellowing of the tips of the lower leaves is the first symptom of B deficiency in both young and mature plants. The yellowing spreads around the margins of the leaves and progresses up the plant. Brittleness of the foliage is characteristic. Severe B deficiency results in death of the growing point.

Molybdenum (Mo)

- Forms taken up by plant – $\text{MoO}_4^{=}$ and is required in the smallest amounts of any mineral nutrient. Excess may be toxic to grazing animals.
- Functions in plants – 1) It is needed for the conversion of NO_3^- to NH_4^+ in plants, 2) Mo is required by rhizobia for N fixation in the nodules of legumes.
- Symptoms
- Interveinal chlorosis and a pale yellow margin develops on the older leaves.

Reference:

Diagnosing Nutrient Disorders in Fruit and Vegetable Crops. 2005. Peter M. Bierman and Carl J. Rosen, Department of Soil, Water, and Climate, Extension Publication 1190, University of Minnesota.

Matted-Row Strawberry Planting Date Delayed?

Kathy Demchak | Penn State

In a year like this one that had constant rain, planting of dormant plants in matted row systems was delayed for many growers. There are several things growers can do to help their current plantings and perhaps buy more “wiggle room” in the future, should we run into this situation again.

Normally we'd like to plant strawberries early in the spring (April or early May), and this is for several reasons. First, strawberry root growth is best at cool soil temperatures of about 45 to 60 degrees. In 2025 in Centre County, soil temperatures were in this range from April 1 to May 1, so that would have been our ideal planting time. Planting earlier than these dates would have been good for warmer areas of the state, while slightly later planting would have been fine in cooler locations. Second, we want mother plants to become established before they start allocating significant resources to runner production. Runner production can start in late spring and usually doesn't start in a new planting until the plants have 5 or 7 leaves or so. More runners are produced faster as days lengthen and temperatures warm, and this can put stress on a newly planted plant. Third, the plants' carbohydrate reserves can become depleted over time as they are stored, resulting in weaker plant growth.

However, if planting early doesn't happen, what can you do either this year or sometime in the future should weather be similar, or perhaps you just can't plant “on time” due to insufficient labor or other considerations?

If you find that the weather forecast is not looking good for the week that you plan to plant, you can call the nursery and ask them to delay shipment, which they will generally gladly do. After all, they know the plants won't grow well if they aren't stored at cold enough temperatures (i.e., slightly below freezing) and would probably prefer storing them for you rather than trying to help you figure out why they didn't grow well later.

Make sure you have sufficient irrigation to help the planting become established right after planting should the weather turn warm and dry and for any future warm dry spells. Growers should be aware that strawberry plants will produce fewer roots and leaves under hot temperatures, resulting in likely yield reductions in the first harvest year.

Check your new plants' crowns and root systems, especially if you were storing the plants yourself. If they don't look great, find out whether you can obtain more plants from the nursery, or think about whether you might want to try to eek another year out of a portion of an existing planting. There is probably little point in planting plants that are questionable looking from the start.

If the plants' crowns and roots look good, and you have extra plants ordered (or you can obtain more), decrease the spacing between plants within the row so you can hopefully make up for a reduced yield per plant with more plants. Besides making sure that the plants have sufficient water, absolutely remove the flower trusses as soon as they emerge, also. Every bit of energy that can be directed into plant growth will help.

Timing of nitrogen applications that would normally be made after planting could be a little tricky. Typically, when plants are planted early in the season in clay loam or silt loam soils, we recommend applying 20 to 30 lbs of actual N per acre when the first runners are produced, usually 4 to 6 weeks after planting, and again in mid-August. However, if you haven't planted until the time when you would normally make your first nitrogen application, then what should you do? Nitrogen does encourage plants to produce more runners, so we need to be sure that they have enough but also don't want to take a chance on burning the roots. In this case, it would likely be better to stay with rates on the low end of the range (20 lbs of actual N/acre) and still make two applications so that the nitrogen is used efficiently, while condensing the timing a bit and delaying the second application slightly. For example, if plants were planted in early July, the first nitrogen application could be made 4 weeks after planting (early August), with the second application made in early September.

For future years, it may be safest to aim for an early planting date. Besides all of the reasons mentioned above, an added bonus is that you give yourself more weeks to plant that might have good weather, increasing your chances for having a vigorous planting.



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Spotted Wing Drosophila (SWD) - 2025

Kathy Demchak | Penn State University

By the time this is in print, spotted wing drosophila will be present across the state, though in variable numbers. Berries, cherries, and any soft fruit such as late-season peaches are subject to attack.

Finding males with their characteristic wing spots means that females are present to lay eggs in the fruit. Females have larger more heavy-duty ovipositors than other fruit flies, which allows them to poke into otherwise intact fruit.



Male (left) and female (right) spotted wing drosophila fruit. The size and position of the wing spots on the male is the characteristic that makes them discernable from other fruit flies. Females have no wing spots. Photo: K. Demchak, Penn State

Signs that SWD is present include soft areas on strawberries, juice on the receptacles of raspberries once the berry is pulled off, light-colored or soft individual drupelets on blackberries, and pinprick-sized holes in blueberries that exude juice when squeezed. Sunscalding on strawberries and blueberries due to the heat we've had this year could be mistaken for SWD presence.



Blackberry fruit infested by SWD. Eggs connected to white breathing tubes are visible under the skin in the top left and top right drupelets. The top center drupelet is light in color due to SWD larval feeding. Photo: K. Demchak, Penn State

If you wish to monitor for SWD, this can be done using SWD lures or apple cider vinegar with traps, or red sticky cards.

Cultural controls should be used as much as possible, which will help to keep the number of SWD present low, thus decreasing the percentage of fruit lost to damage. Fruit should be harvested frequently and thoroughly. With raspberries this means every day, or every other day at a minimum. Any cull fruit should be removed from the field and bagged. Using landscape fabric in raspberry plantings makes it easier to keep cull fruit cleaned up from the ground. Fruit should be refrigerated as close to 32 degrees as possible immediately after picking. Plantings should be kept weeded and pruned, which will make the environment less favorable to SWD and allow sprays to infiltrate the canopy better.

Many different insecticide sprays have very good efficacy on SWD, but good efficacy is dependent on thorough coverage and a frequent spray schedule, usually about weekly. With a frequent spray schedule such as this, rotating pesticide chemistries is important to avoid resistance development. Effective chemical classes and pesticides in them include the pyrethroids Mustang Maxx, Brigade, and Danitol, the spinosyns Delegate and Radiant, diamides Exirel and Verdepryn, and if growing only blueberries, certain organophosphates (Imidan, malathion if at a higher rate) and carbamates (Lannate). Be sure to check the labels for the crops they can be used on, as not all can be used on all berry crops or tree fruit, and observe the PHIs and REIs. Those using organic practices can use Pyganic or Entrust, but be aware that some SWD resistance to these products has already been found elsewhere. Lannate and Brigade are restricted-use products.

Spotted wing drosophila may not appear on the labels of all of the products listed above. In PA, currently a pesticide can be used for a pest not on the label as long as the timing, rate, site of application, re-entry and pre-harvest intervals, and any other specifications stated on the label are observed. If you are from outside of PA, consult the label and your state's registrations for allowable products in your state.

Penn State has a series of 4 fact sheets with color photos that are available for download and printing for free: "Spotted Wing Drosophila – Part 1: Overview and Identification", which includes photos of SWD but also other fruit flies that could be mistaken for it:

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<https://extension.psu.edu/spotted-wing-drosophila-part-1-overview-and-identification>;

“Spotted Wing Drosophila – Part 2: Natural History”, which describes SWD’s life cycle and more: <https://extension.psu.edu/spotted-wing-drosophila-part-2-natural-history>;

Spotted Wing Drosophila – Part 3: Monitoring, which describes some easy ways to monitor for this pest: <https://extension.psu.edu/spotted-wing-drosophila-part-3-monitoring>;

and finally, Spotted Wing Drosophila – Part 4: Management, which describes cultural and chemical controls that can be used: <https://extension.psu.edu/spotted-wing-drosophila-part-4-management>.

First Sweet Corn Field

Harvest Valley Farms

Our first sweet corn field is planted in black plastic. The black plastic absorbs the heat from the sun and transfers it to the soil. We can get the corn to come ready two weeks sooner using the plastic. That is pretty much the case with just about any crop. The latest improvement on that idea is the use of biodegradable plastic so we don’t have to pick it up. We had corn for dinner last night and I can give you some advice for when you come to the market to get some: Get enough. Because when you eat it, you are going to want more.



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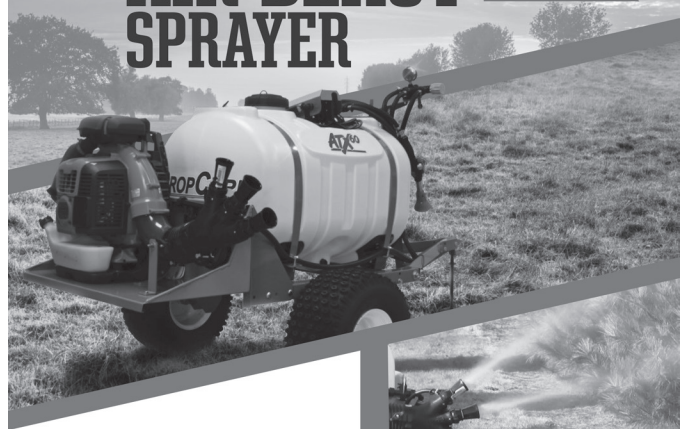
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This is not a form to renew your dues for 2026.

Basic Information (required)

Name _____ Farm Name _____

Address _____

City _____ State _____ Zip _____ County _____

Phone _____ Fax _____ Email _____

Business Information – check all that apply (required)

- ☐ Grower(owner-operator) ☐ Retail ☐ Wholesale
☐ Fresh Market Vegetables ☐ Processing Vegetables ☐ Greenhouse Vegetables ☐ Potatoes
☐ Bedding Plants ☐ Cut Flowers ☐ Small Fruit ☐ Tree Fruit ☐ Wine Grapes
☐ Grower Employee ☐ Processor ☐ Supplier (equipment, chemicals, etc.) ☐ Other _____

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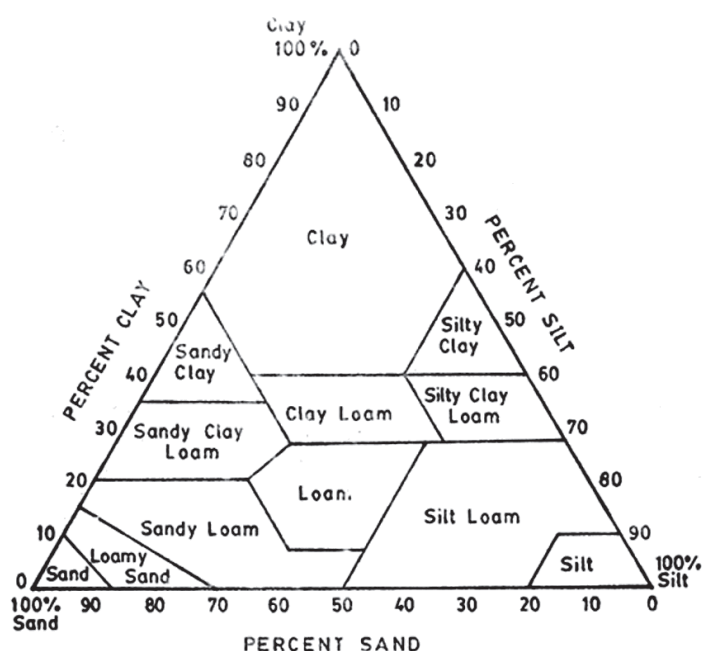


Soils and Fertilizers

Dr. M. D. Orzolek | Prof. Emeritus Vegetables | The Pennsylvania State University

Soils not DIRT are composed of varied size solid particles that have spaces between them. The spaces or pores allow air and water movement in the soil profile. Pore spaces also provide room for plant roots, microbes and other soil organisms.

Soil composed of different proportions of sand (coarse particle), silt and clay (fine particle). The amount of sand or clay in a particular soil will determine 1) water infiltration rates, soil moisture capacity rate of soil warming in the spring and compaction potential.



Soils are a mixture of different things; rocks, minerals, and dead, decaying plants and animals. Soil can be very different from one location to another, but generally consists of organic and inorganic materials, water and air. The inorganic materials are the rocks that have been broken down into smaller pieces. The size of the pieces varies. It may appear as pebbles, gravel, or as small as particles of sand or clay. The organic material is decaying living matter. This could be plants or animals that have died and decay until they become part of the soil. The amount of water in the soil is closely linked with the climate and other characteristics of the region. The amount of water in the soil is one thing that can affect the amount of air. Very wet soil like you would find in a wetland probably has very little air. The composition

of the soil affects the plants and therefore the animals that can live there. The texture of the soil, how it looks and feels, depends upon the amount of each one of the major components in that particular soil.

A Soil Profile refers to the layers of soil; horizon A, B, and C. Horizon A refers to the upper layer of soil, nearest the surface. It is commonly known as topsoil. In the woods or other areas that have not been plowed or tilled, this layer would probably include organic litter, such as fallen leaves and twigs. The litter helps prevent erosion, holds moisture, and decays to form a very rich soil known as humus. Horizon A provides plants with nutrients they need for a great life.

The layer below horizon A is horizon B. Litter is not present in horizon B and therefore there is much less humus. Horizon B does contain some elements from horizon A because of the process of leaching. Leaching may also bring some minerals from horizon B down to horizon C. Horizon C consists mostly of weatherized big rocks.

Soil parameters that influence plant growth: soil pH, soil organic matter and cation exchange capacity (CEC).

Soil pH measures the hydrogen ion concentration in the soil and is expressed as a value between 1 and 14 with 1 being extremely acidic and 14 being extremely basic. Most plants grow well between a pH range of 6.0 to 7.0.

Soil organic matter functions:

- 1) It acts as a storehouse for nutrients – N, P, S, B, Zn, and other micronutrients.
- 2) It increases Cation Exchange Capacity
- 3) It provides energy for microorganism activity
- 4) It releases carbon dioxide
- 5) It increases the water holding capacity
- 6) It stabilizes soil structure and improves soil tilth
- 7) It provides surface protection and thus reduces soil crusting and increases water infiltration rates
- 8) It reduces the effects of compaction
- 9) It buffers the soil against rapid changes in acidity, alkalinity, and salinity.

Cation Exchange Capacity – Cation exchange means the exchange of one cation for another in a solution

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phase. Soil colloids have adsorbed to their exchange sites numerous cations, including calcium, magnesium, potassium, sodium, ammonium, aluminum, iron and hydrogen. These ions are held on the clay particle with varying degrees of tenacity, depending on their charges and their hydrated and unhydrated radii. As a rule, ions with a valence of 2 or 3 are held more tightly than monovalent cations. Also, the greater the degree to which the ion is hydrated, the less tightly it will be bound to the negatively charged particle.

Anions – phosphates, sulfates and to a lesser degree chlorides and nitrates – are adsorbed in soils high in 1:1 clays and those containing hydrous oxides of iron and aluminum than it is in soils with predominantly 2:1 clays. The mechanisms responsible for anion retention in soils are much more complex than the simple electrostatic attractions involved in most cation exchange reactions.

Nutrients/Fertilizers

Macro nutrients required for active plant growth in relatively large quantities (50 to 400 lbs/A):

N – P – K – Mg – Ca – S

Micro nutrients required for active plant growth in relatively minor quantities (5 to 150 ppm):

B-Fe-Mn-Zn-Cu-Mo-Co-

A fertilizer is any substance containing one or more recognized plant nutrient(s) that is used for its plant

nutrient content. Unprocessed animal and vegetable manures, marl, lime, limestone, wood ashes, and other products are exempt from this definition.

A fertilizer material or carrier is a fertilizer which either;

1. Contains important quantities of no more than one of the primary plant nutrients such as N – P – K₂O or
2. Has 85% or more of plant nutrient content present in the form of a single chemical compound or
3. Is derived from a plant or animal residue or by-product or natural material deposit which has been processed in such a way that its content of plant nutrients has not been materially changed except by purification or concentration.

A complete fertilizer contains the three major plant-nutrient elements – N-nitrogen, P-phosphorus, and K – potassium. The fertilizer grade refers to the minimum guarantee of the plant nutrient content in terms of total nitrogen, available phosphorus pentoxide, and soluble potassium oxide (6-24-24) for example with a 1-4-4 ratio of N-P-K. There are both acid forming (decreasing soil pH) and basic forming (increasing soil pH) fertilizers

Dry fertilizers in prilled or pellet form and Clear liquid fertilizers in which the N-P-K and other materials are completely dissolved in solution. Also there are Suspension fertilizers in which some of the fertilizer materials are suspended as fine particles.

PVGA

Featuring recipes that include vegetables

recipe corner

Breaded Parmesan Zucchini Sticks

Submitted by Pete Flynn

INGREDIENTS

- 3 medium zucchini squash, ends trimmed then cut into wedges
- 2 large eggs
- ½ cup grated parmesan cheese
- ⅓ cup Italian style breadcrumbs
- ½ tsp kosher salt
- ¼ tsp ground black pepper

INSTRUCTIONS

1. Heat oven to 400°F.
2. Cover a large baking sheet with foil for easy clean-up.
3. Beat eggs in a shallow bowl.
4. Combine parmesan, breadcrumbs, salt and pepper on a plate.
5. Dip zucchini in egg, then turn in cheese mixture to coat.
6. Place wedges, skin-side down, on baking sheet in a single layer.
7. Bake 20 to 25 minutes or until light golden brown.
8. Serve while hot.

Heavenly Peach Pie

INGREDIENTS

Crust

- ½ cup soft butter
- ⅓ cup sugar
- 1 tsp vanilla
- 1 cup flour

Filling

- 8 oz cream cheese, softened
- ¼ cup sugar
- 1 egg
- ½ tsp vanilla

- 4 cups peaches
- ½ cup sugar
- ½ tsp cinnamon
- 1 tbsp lemon juice
- 1 tbsp flour

INSTRUCTIONS

1. Combine butter and sugar, add vanilla and flour
2. Stir until forms dough
3. Pat into 9-inch greased pie pan
4. Blend cream cheese, sugar, egg and vanilla with mixer until fluffy
5. Pour into crust
6. Mix together peaches, sugar, cinnamon, lemon juice, and flour
7. Spoon on top of cream cheese filling
8. Bake 30-35 minutes at 400°

Refrigerate leftovers

To substitute peaches with raspberries, replace the last five ingredients with the following:

- 2 ½ cups raspberries
- ½ cup brown sugar
- 1 tsp cornstarch

To substitute peaches with apples, replace the last five ingredients with the following:

- 4 cups apples, sliced
- 2 tsp cinnamon
- ½ cup sugar
- 1 tbsp flour

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