Safe Wisconsin Produce

Spring 2026

Soil Amendments and Risk Assessments

When farmers choose whether to use soil amendments and what type to use, there are many factors to consider. What is the cost or return on investment? Where will I store it, and how long does it last? Will it benefit more than just one crop with a specific nutrient need? Among all the considerations are also issues of food safety risk. There are many choices regarding soil amendments and practices that have an impact on food safety risks.

Figure 1. Tractor fertilizing brown field.

Soil amendments are any chemical, biological, or physical material intentionally added to the soil to improve the chemical or physical condition of soil in relation to plant growth, or to improve the capacity of the soil to hold water. The term *soil amendment* is legally defined with many related definitions that impact both regulatory requirements and food safety risk. Non-biological soil amendments such as perlite and granular urea are the lowest risk because microbes that cause human illness (i.e. pathogens) cannot grow in them. No soil amendment is without risk, however, and care must be taken to avoid contamination of all soil amendments.

Biological soil amendments can be further divided into those that are of animal origin and those that are not. Pre-consumer vegetative waste, such as the snipped ends of green beans, weeds, and substandard product from a canning operation, can contain chemical hazards such as soap and sanitizers and physical hazards such as metal wire, field rocks, or personal protective equipment from processing operations. There is a moderate level of food safety risk with this type of waste and other biological soil amendments because of a range of potential physical and chemical hazards and the potential for pathogens, such as Salmonella, to grow. These may or may not be fully composted before application and, like any soil amendment, must be protected from contamination. Table waste like leftovers from restaurants and households could be contaminated by saliva from consumers or feces from pets, so this is considered to be a biological soil amendment of animal origin (BSAAO) and not pre-consumer vegetative waste.

Figure 2. Compost thermometer.

Biological soil amendments of animal origin present a higher risk because of their potential to contain pathogens. Besides table waste, this category includes many products from fish emulsion and bone meal to eggshells and most commonly, manure. When properly treated with a scientifically validated process, the food safety risk is greatly reduced, and these soil amendments can be applied safely to produce at any time up to the date of harvest. Certain soil amendments, like pelleted chicken manure, tend to be heat treated with specialized equipment. Most biological soil amendments of animal origin can be composted to achieve a high degree of safety, and there are two methods provided in the produce safety rule that have been scientifically validated:

Static Composting	Turned Composting
• Minimum 131°F (55°C) • Temperature maintained three consecutive days • Oxygenated conditions maintained • Adequate curing	• Minimum 131°F (55°C) • Temperature maintained 15 days • Oxygenated conditions maintained • Minimum of five turnings • Adequate curing

If you choose one of the aforementioned composting methods, and your farm is covered by the produce safety rule, then you must apply them in a manner that minimizes the potential for contact with covered produce during and after application. You must also keep records of your treatment process. Aside from the flexibility of applying at any time, other benefits specifically for using composted manure instead of untreated manure include greatly reducing nutrient runoff, odors, and even soil compaction since less hauling and spreading is required.

Figure 3. Tractor managing soil.

Regardless of which soil amendments you use, it is important to handle, convey, and store them in a way that minimizes the risk of them becoming contaminated. Using dedicated tools and equipment for treated soil amendments or cleaning and sanitizing tools and equipment before use with any soil amendment are good practices that can help reduce risks. Choose a location to store your soil amendments that will protect them from runoff, wind, and animals. This can include fencing, berms, siting uphill from areas with livestock, or covering them when not in use.

You might still choose raw, untreated manure though this type of soil amendment carries the highest level of food safety risk. For this reason, it is critical that untreated manure is applied in a manner that does not contact covered produce during or after application so that there is no restriction on the time interval between application and harvest (application interval.) If you can only minimize contact with covered produce after application, you should consider an extended application interval such as 90 days or 120 days and whether the crops contact the soil to align with USDA National Organic Program standards. Depending on the days to maturity for your crops this might mean applying raw, untreated manure in the fall well in advance of planting. For now, there is not yet a specific application interval in the produce safety rule for biological soil amendments of animal origin, such as untreated manure, that may contact covered produce after application. Still, there is new data available to help you understand the impacts of many risk factors and guide your farming practices to reduce risks.

The US Food and Drug Administration (FDA) has released an interactive online tool to explore risks as a complement to their report, Risk Assessment of Foodborne Illness Associated with Pathogens from Produce Grown in Fields Amended with Untreated Biological Soil Amendments of Animal Origin. This tool allows users to adjust model variables to see the effects on predicted pathogen concentration on crops as well as risk estimates. You can see how results change across regions, seasons, crops, sources of contamination, and importantly, the effect that application interval has on the predicted number of illnesses. Access the reports and use the online tool here:

FDA Biological Soil Amendments of Animal Origin-Produce Risk Assessment Output Explorer
https://pub-connect.foodsafetyrisk.org/content/6851ecb5-0122-45b7-af14-bd326ee07e6f/

Any application of soil amendments is going to carry some risk, but just being aware of that risk is not the same as mitigating that risk. However, knowing the relative level of risk and potential impact of changes to agricultural practices can help you make a more informed decision within your overall nutrient management plan.

Nutrient Management Plan Survey

Your input is requested to advance the science of nutrient management plans (NMPs.) The University of Wisconsin – Madison is conducting research to further understanding of farmers' perceptions of NMPs, economic barriers, and practicality of implementing site-specific NMPs across a scale of operations. No names will be recorded, your responses are solely for this research project, and completion of this survey is voluntary.

Survey Link:
https://forms.gle/Ug1ZzYHBA4prrY8h8

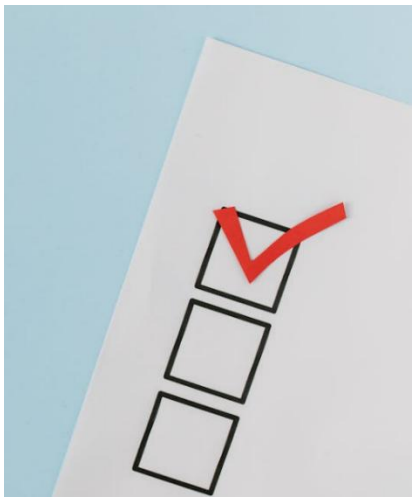

Figure 4. Nutrient Management Survey.

More Tomatoes, Better Tomatoes

Tomatoes are one of the most popular crops grown by farmers in Wisconsin. They are valued not only for their taste and nutrition, but also for the enjoyment of growing them. With a basic understanding of how tomatoes grow and what they need, farmers can improve both the quality and quantity of their harvest.

Did you know?
Tomatoes are the second most consumed vegetable in the United States based on per capita consumption!
Source: USDA Economic Research Service

Figure 5. Tomatoes on the vine.

Choosing the right tomato variety is an important first step, and there are so many shapes, sizes, and colors to choose from! However, it helps to pick varieties that match your growing conditions. Because tomatoes need a long, warm season, farmers in northern Wisconsin should choose varieties that mature quickly such as Quick Pick, Early Cascade, or Sub-Arctic Plenty. Those in southern areas have more flexibility. You should also decide between hybrid and open-pollinated varieties. Hybrids are bred for traits like disease resistance and size, but their seeds cannot be reliably reused. Open-pollinated types, including heirlooms, are known for unique flavors, and their seeds can be saved, though they may be more prone to disease. Growing several different cultivars can help protect against disease and ensure a more continuous supply of fruit.

Tomatoes also differ in how they grow. Determinate plants are bush-like and produce most of their fruit at once, while indeterminate plants grow continuously and produce fruit throughout the season. Indeterminate types usually need support, such as staking or cages, to stay healthy and productive.

It is best to start tomatoes indoors or buy young plants instead of planting seeds directly in the field. Seeds should be started four to eight weeks before transplanting. Once the weather warms and frost danger has passed, plants can be moved outside. Before planting, they should be gradually exposed to outdoor conditions no less than 40°F to 45°F in a process called hardening off.

Did you know?
Tomatoes are considered a priority commodity for FDA due to the number of outbreaks associated with the commodity.

A few food safety reminders:

- Keep livestock and pets out of growing areas as much as possible.
- Assess your crop prior to harvest for contamination with animal feces and don't harvest contaminated produce.
- Don't harvest or distribute tomatoes that have dropped onto the ground.

Tomatoes grow best in full sun and well-drained, fertile soil. Proper spacing is typically 18 to 24 inches between plants and 36 to 48 inches between rows depending on your support system and field equipment. Water deeply but not too often, as shallow watering can weaken roots. Adding mulch at planting can help control weeds and keep moisture in the soil. Fertilizer may be needed, but too much nitrogen can lead to leafy plants with few fruits. Supporting tomato plants helps keep them off the ground, further reducing potential for rot and disease. Cages, stakes, and trellises are all effective methods. Pruning is helpful for indeterminate plants, as it improves airflow and focuses energy on fruit production.

Tomatoes can be affected by diseases like early blight, Septoria leaf spot, and late blight. These problems often thrive in humid, crowded conditions. Preventive steps include proper spacing, crop rotation, and removing infected plants. Insects such as aphids and hornworms can also damage plants and should be monitored.

Harvesting tomatoes when they are fully ripe yields the best flavor, but mature fruits harvested when they are green will still ripen and allow more time for them to reach market. You may wash your tomatoes, but washing produce is not a requirement of the Produce Safety Rule. Store them at temperatures between 55°F and 70°F since colder temperatures will negatively affect flavor. To extend the growing season, farmers can use row covers or sprinkler irrigation to protect them from frost. With proper care, tomato plants can provide a steady and rewarding harvest.

Did you know?
Until the 1700s, many people believed tomatoes were toxic. This wasn't because of the tomato itself—it could have been because of their relation to nightshade plants that do contain a chemical poison. It also might have been due to a reaction with pewter plates (which contained lead). The acidity of tomatoes could leach lead from the plates, causing poisoning. Because of this, tomatoes were nicknamed "poison apples."

- Adapted from "A Plain Language Guide, Growing Fresh Market Tomatoes" available from DATCP at: https://datcp.wi.gov/Documents/GrowingTomatoes.pdf
- Learn more about growing tomatoes in Wisconsin From UW-Extension: Homegrown Tomatoes for Wisconsin – Wisconsin Horticulture
- Growing Tomatoes, Peppers, and Eggplants in Wisconsin – Wisconsin Horticulture

The Spotted Lanternfly is on the Move!

By Mitchell Lannan, DATCP Forest Entomologist | Michelle Bogden-Muetzel, DATCP Plant Pest Communications Specialist

Since its introduction to the eastern United States in 2014, the invasive spotted lanternfly (*Lycorma delicatula*) has quickly spread westward and is now within 50 miles of Wisconsin's southern border. Entomologists at DATCP are preparing for another year of survey efforts to detect potential introductions of this pest. Surveys consist of visually inspecting host plants near areas with high out-of-state traffic, including freeways, trainyards, and warehouses, as invasive species are often accidentally spread from human transport.

Figure 6. Two spotted lantern fly egg masses.

The spotted lanternfly (SLF) is notorious for its ability to spread through hitchhiking, often finding its way into new areas through the movement of its eggs. Eggs are laid in clay-colored masses, resembling a smudge of dirt. These inconspicuous egg masses can be laid on anything stored outdoors, such as nursery plants and pots, lumber and firewood, landscaping rocks, and even vehicles, allowing this pest to spread with ease. Seeing Spots - Spotted Lanternfly and Spring Egg Hatch | BYGL

It is currently uncertain whether SLF will be able to survive in the colder areas of Wisconsin once it gets here. Its primary host plant, the invasive tree-of-heaven (*Ailanthus altissima*), has only been found in the southern half of the state, with large numbers in the Milwaukee and Madison metro regions. The range of tree-of-heaven aligns well with SLF's cold hardiness capabilities, with models showing the highest chances of survival in the southeastern corner of the state along Lake Michigan. The combination of cold temperatures and the lack of tree-of-heaven may leave much of the state less suitable for SLF.

Beyond tree-of-heaven, SLF also feeds on other plant species including grape, walnut, hops, and maple. This feeding can cause plant stress, especially in drought conditions, but is not likely to cause plant mortality. In states where SLF is already established, grape growers report the most damage, sometimes having to apply additional applications of insecticides each year or seek out labor intensive non-chemical control options. Other produce growers will likely experience SLF as more of a public nuisance similar to boxelder bugs or Asian lady beetles rather than a direct threat to their crop yield, though the impacts of SLF have yet to be fully understood in many parts of the United States.

Help DATCP find spotted lanternfly when it first arrives in the state by keeping an eye out for this insect's life stages on outdoor items, especially on vehicles and shipments coming from eastern states. SLF is easiest to spot in its adult stage, 1-inch long and having pinkish-gray wings with black spots. Adults are active from July through October. If you suspect you have found SLF in Wisconsin, please take a photo and report your finding to DATCP at slf.wi.gov.

Adult SLF in Apple Orchard (Pennsylvania growers struggle with spotted lanternfly - Fruit Growers News**)**

Adult SLF (Spotted Lanternfly Has Arrived in Kentucky | Warren County Agriculture)

Produce Safety Rule Grower Training Opportunities

DATCP provided a short but successful series of grower trainings in January and February that our Safe Wisconsin Produce team provided in Wisconsin Dells, Hillsboro, and Cambria. Thanks to the host facilities and all who attended to make food safety a priority for their farms! Our next offering is most likely to be next January, but until then there are still many upcoming grower training opportunities provided in cooperation with the Cornell College of Agriculture and Life Sciences and the Produce Safety Alliance which are linked below.

Upcoming Grower Trainings | CALS
https://cals.cornell.edu/produce-safety-alliance/training/grower-training-course/upcoming-grower-trainings

Staff Update

Our Safe Wisconsin Produce team has grown recently, and we're excited to share our latest members and their roles within our program. Below are the general areas that our staff cover most often related to produce farms. Did you know our sanitarians and specialist conduct inspections of not only covered produce farms but also manufactured food facilities? Just ask! They can help you understand requirements for wholesaling processed food.

Krystal Martin	Produce and Manufactured Food Program Manager	State-wide
Joseph Myers	Supervisor and Produce Program Co-manager	State-wide
Nichole Kirk	Program and Policy Analyst	State-wide
Stefan Boerboom	Environmental Health Technical Specialist	State-wide
Corrine Hasselman	Environmental Health Sanitarian	Southern Wisconsin
Jacob Multerer	Advanced Sanitarian and Sampling Program Coordinator	State-wide
Caroline Paquin	Environmental Health Sanitarian – Senior	Western Wisconsin
Maura Scholl	Environmental Health Sanitarian	Southcentral Wisconsin
Andrew Vetter	Environmental Health Sanitarian – Advanced	Southwest Wisconsin
Lisa Wipfli	Environmental Health Sanitarian	Eastern Wisconsin
Jacob Zimmerman	Environmental Health Sanitarian – Senior	Northern Wisconsin

If you are interested in expanding your operations beyond fresh produce and into processed foods, please call our staff at (608) 224-4923 or email at datcpdfslicensing@wisconsin.gov.

Contact Us

As always, the Safe Wisconsin Produce team welcomes your feedback and engagement. If you would like to share your produce safety story to be featured in the next newsletter, or if you have other questions, please send us a note at safeproduce@wi.gov or call (608) 224-4511.

Resources

SWP Webpage Updates

Safeproduce.wi.gov contains tons of helpful information for growers. If there is something you would like to see on the website, let us know. The page is intended to be a resource for growers, buyers, and consumers, and we appreciate your perspective.

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