

# Food Safety in Louisiana School Gardens



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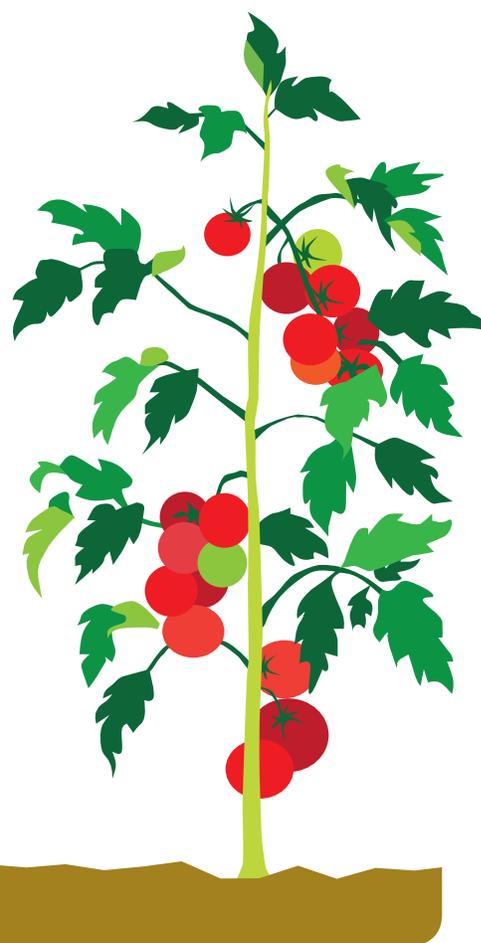
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School gardens are useful teaching tools. When used as outdoor laboratories, gardens enhance students' knowledge of where food comes from, how food is grown, plant life cycles, nutrient cycles, seasons, plant and animal interactions and other topics that commonly are found in standardized lessons used across the United States.

Beyond improving students' knowledge of the natural world, school vegetable gardens yield fresh, nutritious and locally grown produce. Students who engage in planting and tending the garden may be more willing to try fruit and vegetable crops that they normally would pass up or turn down. Consuming the produce is one of the many rewards of growing a garden!

Food safety policies and concern for children's health make it understandable that certain precautions need to be taken when harvesting produce from the school garden. Preventing foodborne illnesses is a priority at grocery stores and local farms and also should be important to those consuming produce grown in their backyard and school gardens.

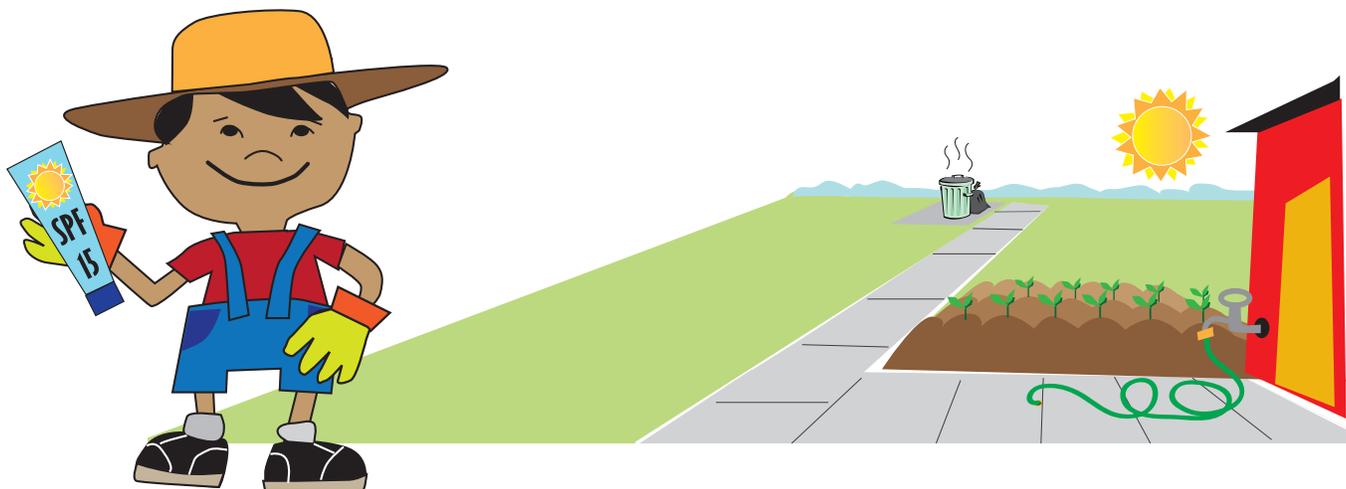
The Food Safety Guide for Louisiana School Gardens presents good agricultural and handling practices that are easy to implement in a school garden setting. Although they are not regulations, these are general guidelines and recommendations we feel all schools should follow.



## Proper Garden Attire

The best vegetable gardens always are located in full sunlight. While plants enjoy baking in the sun, a human's skin does not fare as well.

To prevent overexposure to sunlight and especially to the ultraviolet, or UV, rays that cannot be seen, encourage students to wear garden hats with wide brims. Application of sunscreen with a minimum SPF 15 to the arms, face, legs and neck also is helpful if it's applied 30 minutes prior to spending significant time in the garden. Wearing closed-toed shoes is recommended not only to keep feet from getting dirty but also to protect feet and toes from injury if a student drops a sharp garden tool. Garden gloves also may help prevent blisters when using tools and pulling excessive weeds.



## Site Selection

Most vegetable gardens need well-drained soil located in full sunlight with easy access to a water source (six to eight hours of direct light each day). See Steps to Starting a Successful School Garden, LSU AgCenter Publication 3145, for more information.

In addition to selecting the ideal location for vegetable growth, choose a safe location. Locate the school garden site away from any septic tanks and garbage collection areas. Before you dig in the soil, call La One Call (811). They will mark any underground gas, electric or other utility lines that you should avoid when tilling into the soil. If you are considering building a garden on ground that was previously used (in the past year) as pasture ground for cows or other animals, you should wait nine months before harvesting anything you grow in that garden – because raw manure is considered a potential source of contamination.

## Soil Testing

Have the garden soil tested for lead and arsenic. The Environmental Protection Agency has issued statements warning to avoid planting vegetables in soils with lead levels greater than 400 ppm and arsenic levels greater than 39 ppm.

If soil has elevated levels of either, consider constructing raised beds with a barrier such as groundcover cloth between the native soil and “trucked-in” garden soil. Soils test for heavy metals can be submitted to LSU AgCenter’s Agricultural Chemistry Department. Call (225) 342-5812 or visit [www.LSUAgCenter.com/en/our\\_offices/departments/Ag\\_Chemistry/forms](http://www.LSUAgCenter.com/en/our_offices/departments/Ag_Chemistry/forms) for more details.

It also is a good idea to have soil tested for macro- and micronutrients every three years to make sure you aren’t over- or underfertilizing. Routine tests for soil nutrients can be submitted to the LSU AgCenter’s Soil Testing and Plant Analysis Lab. Call (225) 578-2110 or visit [www.LSUAgCenter.com/soiltest](http://www.LSUAgCenter.com/soiltest) for details.



The Soil Testing and Plant Analysis Lab will provide soil test results and recommended rates and sources of fertilizer needed to correct any imbalances. A flat-rate mail-in soil sampling box good for up to three soil samples also is available at the LSU AgCenter office in each parish.

Fertilizer periodically will need to be incorporated into the garden to increase plant productivity. Both organic and conventional fertilizer sources should be handled with caution. If students are very young and tempted to ingest the fertilizer, have teachers or adult volunteers apply it. Older students should wear gloves when applying fertilizer, since the salts in it can cause a stinging sensation if rubbed into open wounds. Wash hands immediately after handling fertilizer.

Keep separate measuring cups, spoons and beakers for the garden. Mark with the words garden and fertilizer to avoid cross-contamination with measuring tools used for other tasks such as food preparation.



## Using Compost or Manure

Backyard compost is prepared by using biowaste such as yard trimming and food scraps. If you have woody waste, grind it and mix with grass and leaves. Do not mix pet fecal materials in the compost since that could be a source of pathogens.

Maintain the moisture of the compost pile between 40 percent and 70 percent and “turn” it frequently to ensure a good supply of oxygen. Turn the pile when the temperature of the pile is above 135 degrees Fahrenheit for three days and repeat this step five times. Measuring the internal temperature of the compost pile is most easily accomplished by purchasing a compost thermometer (with a probe at least 20 inch long). Turning of the pile exposes cooler materials to the interior heat of the pile.

Backyard composts often are cured and aged for a year to produce a stable, mature and humus-rich material suitable for growing plants.

If you buy compost that included manure, allow 45 days between compost application and harvesting fresh produce. If possible, apply and mix the compost in the soil before you plant. Do not use containers that were used to carry compost for carrying produce. Follow food safety practices such as hand-washing and minimizing the contact of compost with the edible portion of the plant while handling compost.



## Pesticide Use

Pesticides (fungicides, bactericides, insecticides) should be avoided in the school garden, if possible. If necessary, however, check with your schools integrated pest management, or IPM, coordinator before applying any pesticides, since each school individually determines what pesticides are and are not acceptably applied on school grounds.

If pesticides are allowed and used in the garden, be sure to read the entire label on the pesticide. Identify the pest or pests carefully and make sure the material you choose is labeled as effective against that pest and is allowed on edible plants.

The three most important numbers on the pesticide label are the:

1. Rate – Over- or underapplication of a pesticide will result in wasted time and money and lack of control of the pest.
2. REI – Stands for re-entry interval or the re-entry period. After a pesticide is applied, there may be a critical period (usually 24 hours or less) when people should avoid re-entering the garden space.
3. PHI – Stands for the post-harvest interval or the number of days that need to pass prior to harvesting any produce from the garden. The post-harvest interval is important because water will not always wash off pesticide residues. In some cases, pesticides are broken down by sunlight and require the time included as the PHI on the label for a reduction in residue.

Post a sign in the garden with the following information each time a pesticide is applied to prevent students from harvesting too early after a pesticide was used:

1. The name of the pesticide used.
2. The date and time the pesticide was applied.
3. The date and time at which students can re-enter the site.
4. The date and time at which produce can be harvested safely and consumed from the garden.

For more information on integrated pest management in the school garden, see LSU AgCenter Publication 3303, A Guide to Controlling Insects in the School Garden, which can be found online at [www.LSUAgCenter.com/en/communications/publications/Publications+Catalog/Lawn+and+Garden/School-Gardens/A-Guide-to-Controlling-Insects-in-the-School-Garden.htm](http://www.LSUAgCenter.com/en/communications/publications/Publications+Catalog/Lawn+and+Garden/School-Gardens/A-Guide-to-Controlling-Insects-in-the-School-Garden.htm)

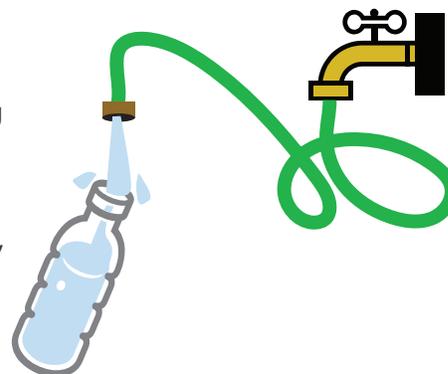


## Safe Sources and Testing of Irrigation Water

If your garden is watered with municipal or city water, it should be safe to use for watering vegetable plants and washing produce for consumption. Gardens watered with well water or surface water (ponds, rivers, bayous) should be tested at least twice annually for genetic E. coli and other contaminants.

The LSU AgCenter can test your irrigation water. If you are interested in submitting a water sample, please contact Evelyn Gutierrez by email at [megutierrez@agcenter.lsu.edu](mailto:megutierrez@agcenter.lsu.edu). In the email's subject line, please write "E-coli Test for Irrigation Water." There is an associated cost for this service.

Avoid using water sources with detectable E. coli for washing fresh produce. When watering produce with overhead irrigation (sprinklers), do not use water that has an E. coli level greater than 235 colony forming units, CFU – or most probable number, MPN, as appropriate – per 100 milliliters for any single sample or a rolling geometric mean (n=5) of more than 126 CFU (or MPN, as appropriate) per 100 milliliters of water. It is always safe to use drip irrigation, such as drip tubing or soaker hoses, when water quality is questionable.



## Allergens: Should Certain Plants Be Prohibited From the Garden?

Most schools are peanut-free zones. The school garden should be too! Although peanut crops are fun to grow, try to avoid this crop in school gardens since so many children have allergies.

Before students consume any food from the garden, they should check with a teacher to make sure it is OK and is the produce they were supposed to eat. For example, one group of students was growing tomatoes in their school garden, but the tomato plants had not yet produced any fruit. The students kept claiming they were eating tomatoes, however. Upon inspection, teachers learned the students were picking up and eating “red berries” on oak leaves. These were not berries but instead were wasp galls. While not poisonous, it’s probably not the best thing to be eating. Make sure students can recognize and know what the mature produce looks like before they consume anything.



## Sanitation and Tools: Work Surfaces, Harvest Boxes, Etc.

Use food-grade boxes or containers to store food harvested from the garden. Food-grade containers include 5 gallon food-grade buckets (such as pickle buckets), kitchen bowls or paper bags. Never use containers that were once used for any types of chemicals to hold or store produce.

Reusable containers should be cleaned with a 10 percent bleach solution after use. Bleach should only be handled by adults.

Wash tools with water to remove soil particles each time you leave the garden.

Also, prepare garden produce on clean work surfaces. To clean work surfaces, rinse with potable water and then wipe the surface with sanitation wipes or clean surface with a 10 percent bleach solution. Always use paper towels for cleaning work surfaces, if possible. Cloth may contribute to cross-contamination.

## Animal Exclusion

Domestic and wild animals should not be encouraged to enter gardens. Following these tips will help prevent foodborne illnesses from contact with animal feces:

- Avoid feeding birds near edible gardens. Wild bird food may attract rodents.
- Keep grass mowed around gardens.
- If funding is available, build a fence around the garden, particularly in areas with high wild animal populations such as stray dogs, deer and wild pigs.
- Do not harvest and consume produce with visible defecation on it. Throw it away. Also, throw away produce that was partially eaten by an animal. Produce that has damage from environmental factors such as wind or rain is OK to consume. Produce that has some insect damage also is OK to consume. You might consider cutting around the portion of the fruit or vegetable that was damaged. But, of course, younger students should not handle knives.
- Pick up rotting produce and throw it in the trash or compost pile.
- To reduce mosquito breeding areas, do not leave pots or containers that collect standing water in the garden.





## Health and Hygiene

Like animals, humans also can be sources of pathogens. Students who are sick (those students expressing excessive coughing or stomach illness such as diarrhea) should not be allowed to handle produce that other students will consume.

Students should wash hands before and after they harvest or prepare any produce grown in the school garden. Proper hand-washing prevents the spread of germs and potentially minimizes the risk of pathogen contamination.

Hands are properly cleaned when students:

1. Wet hands and wrists. If possible, use warm or hot water.
2. Apply soap, lather and scrub between hands and fingers for at least 15 seconds. Students should sing "Twinkle Twinkle Little Star" twice to pass the right amount of time.
3. Rinse for at least 10 seconds in clean water.
4. Dry hands with a paper towel and use the towel to turn off the water source.

A video regarding proper hand-washing steps can be found on LSUAgCenter.com at [http://www.LSUAgCenter.com/news\\_archive/2009/may/radio\\_tv/avoid+potential+illness+with+proper+hand+washing.htm](http://www.LSUAgCenter.com/news_archive/2009/may/radio_tv/avoid+potential+illness+with+proper+hand+washing.htm). A variety of other information also is available by visiting [www.LSUAgCenter.com](http://www.LSUAgCenter.com) and searching for "hand-washing."



## Washing and Storing Produce

If a pathogen is on a single vegetable or one piece of fruit, it has the potential to contaminate the other produce if it is not washed properly. Students should only use potable water when washing produce. The wash temperature should be at least 10 degrees Fahrenheit warmer than the internal temperature of the produce.

Clean water alone will wash most surface contamination off by simply rinsing the produce under the tap. If students plan to wash produce in a large tub or vat of water, however, a produce sanitizer should be used. Produce sanitizers reduce potential microbial contamination on the surface of one or two pieces of produce from spreading to all harvested fruits and vegetables through the wash water.

Produce sanitizers can be purchased in grocery stores and restaurant supply stores. Make sure the sanitizer you choose has the words "food-grade" on the label. Read the entire label of the sanitizer and follow all instructions.

Allow produce to air dry. Do not use a cloth towel to dry produce.

If students do not plan to immediately consume the produce, they should store all produce at or below 50 degrees Fahrenheit. Most produce will store well for up to one week. The length of storage time decreases if the produce was too mature when harvested or if it received excessive damage before or during harvest.

If immediate consumption is not in the plans, some items should not be washed and then stored. Among them are all berries and potatoes. These should be washed immediately before consumption.



## Final Words

This publication was designed to provide teachers, students, parents and volunteers with an awareness of easy-to-implement good agriculture practices that will help prevent potential foodborne disease outbreaks from the school garden.

Growing a school garden is a rewarding experience that provides students with practical skills that many adults do not possess. Students who garden tend to be more willing to try new foods than those who do not. School gardens can help students learn both to grow healthful food and to enjoy consuming healthful food.

The school garden is a wonderful teaching tool that should be welcomed by all administrators, teachers and students. We hope every Louisiana school chooses to grow a garden with its students.



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