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Maryland's Food Gardening Network
University of Maryland Extension

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Food Safety in the School Garden

A school garden can be used for growing tasty and nutritious vegetables, fruits, and herbs, and for teaching youth valuable life skills. An edible school garden can serve as an engaging classroom for attaining a wide range of educational goals, such as learning about math, science, and health. Working in a garden also provides fun, recreation, and exercise, and gives children a first-hand look at the wonders of nature.

School gardens are generally safe, healthy, and enjoyable environments, but it is important to keep safety in mind when children are in the garden or consuming the fruits of their labor. Whether a school gardening program includes a large in-ground garden or simple containers for growing herbs, certain precautions must be followed to avoid potential hazards in the garden – such as insect bites, poison ivy, sunburn, or metal garden tools – and to keep food that is grown safe and wholesome.

Thousands of people in the U.S. become ill each year from eating commercially grown fresh vegetables and fruits that are contaminated with pathogenic (disease-causing) microorganisms. In fact, more foodborne illness outbreaks are linked to fresh produce than to meat or poultry. Bacteria such as Salmonella and E. coli O157:H7 cause foodborne illnesses. Contamination occurs when food crops come in direct contact with these or other pathogenic microorganisms from animal droppings, human waste, polluted water, contaminated equipment or utensils, or other sources. Fortunately, the risk of developing a foodborne illness can be minimized. This fact sheet presents common-sense guidelines for the safe handling of foods grown in school gardens, keeping foods free from pathogens, and maintaining a safe environment for children and teachers working in the garden.

Select the garden site carefully

- Locate the garden away from wells, septic systems, in-ground tanks, and dumpsters.
- Avoid areas where water collects. Vegetables and herbs will not grow well in poorly drained soils that have standing water after rainfall.
- Choose a level site. Sloped ground can lead to soil erosion and nutrient run-off.
- To avoid damaging underground pipelines or wires, contact "Miss Utility" (1-800-257-7777) before digging in the soil.
- Contact the local school system facilities planning department before starting a garden for any other site considerations.

Soil and compost safety

- Soils can contain lead, which is toxic to the nervous system. It is important to minimize the exposure to lead, especially among children who are most affected by it.
    - Test the soil for lead regardless of your location. All soils will have a natural, background level between 5 ppm and 40 ppm. Do not locate school gardens in an area where the total estimated lead level is above 300 ppm.
    - Lead can be absorbed into plant tissue, but the greatest exposure occurs when contaminated soil dust is inhaled, when contaminated soil is ingested by young children, and when soil particles containing lead adhere to garden produce that is later consumed.
    - Information about lead is found in fact sheets HG#18 and HG#110 listed under "Resources" at the end of this fact sheet. (Note: An example of a soil lead test is the one offered by the University of Massachusetts – contact information is on the last page of HG #110- see "Resources" below).
- Compost improves soil quality and should be added every year with these recommendations:
    - It is a good idea to wear gloves when handling compost. Whether or not students wear gloves, they should always wash their hands after handling compost. Use a fingernail brush to remove particles trapped under the nails.
    - Do not add any farm manure or pet waste to compost bins or garden soil. Animal manures contain human pathogens that can contaminate vegetable crops. Commercial manure products (composted or dried at high temperatures) are safe to use in school gardens. Blood meal and dried blood are commercial garden products that are safe to use as a natural fertilizer or animal repellent.
    - Items that can be safely composted include vegetable peelings, leaves, grass, and shredded paper.

Know your water source

- Be familiar with the quality and safety of the water source you use in your garden. If you get your water from a municipal or public water system, it is probably safe and drinkable. Check with your school system or water company if you are not sure about potability.
- If your school uses well water, have the water tested at least once a year to make sure it meets the Environmental Protection Agency standards.

Working in the garden

- Students should not eat anything from the garden unless they are sure it is an actual food. Students should check with an adult if they are not sure.
- Students should learn which plants have both edible and poisonous parts. For example, only the tomato and not the tomato leaves should be eaten.
- Have all parents sign permission slips that list potential hazards and that allow students to work in the garden. Record all allergies, including food and insect, and provide a first aid kit and drinking water.
- Students should wear proper shoes to protect their feet from cuts and stings. Bare feet, sandals, or flip flops should not be allowed.
- Students should be encouraged to wear hats while gardening, and to apply sunscreen to exposed skin if they expect to be in the garden for more than 15 minutes.

- Students should be encouraged to walk on pathways when available.
- Students should wash their hands thoroughly after returning from the garden, using a clean nail brush.
- Be aware that exposure to the sap, leaves, and stems of certain plants (such as squash or tomatoes) can cause mild skin irritation or contact dermatitis in sensitive individuals.

Insects and pest management

- No synthetic herbicides, fungicides, or insecticides (with the exception of mosquito repellent) should be used in the garden, or within 25 feet of the garden.
- There are hundreds of species of insects living naturally on school grounds. The vast majority are benign or beneficial ones that pollinate crops or attack other insect pests. The small minority that feed on vegetable crops can usually be controlled successfully using organic pest management techniques.
- Weeds are controlled with mulches, hand-pulling, and weeding implements – not with herbicides.

Wildlife

- Deer, rabbits, and groundhogs can devastate vegetable gardens. Birds, squirrels, mice, and raccoons can also become troublesome pests. If possible, secure permission, funding, and assistance to erect a fence with a gate. If deer are a problem, the fence needs to be 8 ft. tall. If deer are not a problem, a 4 ft. high fence will suffice. Many types of woven wire and vinyl netting fencing materials are available. A fence will reduce injury to crops, and the risk of harvesting contaminated crops (animal droppings are a potential source of pathogens that cause foodborne illnesses).
- Harvest produce regularly and pick up and remove rotting vegetables.
- Don't feed birds near your garden. Wild bird feed can attract rodents. Don't leave standing water in or near the garden. Mosquito larvae thrive in small amounts of stagnant water.
- Restrict nesting and hiding places for rats and mice by mowing the grass or other vegetation at the edges of your garden.
- Cover the ends of stakes and posts with plastic or metal cones to keep birds from resting and defecating in or near the garden.

Tools and materials

- Closely monitor students using sharp tools, such as spades, trowels, clippers, and scissors. Identify which tools are for adult use only.
- Instruct students using tools to stay an arm's length plus the tool length away from the next person.
- No tools should be held above waist level.
- Students should not run or play around while holding tools.
- All long-handle tools should be leaned against a wall or fence when not in use. Never lay a metal rake on the ground.
- Some gardening materials – such as lime, fertilizers, and soilless growing media – may be dusty when poured or applied to the garden. Handling and using these materials should be reserved for older students and adults who are equipped with a dust mask. Wetting the material before use will reduce dust.
- Monitor the garden for tripping hazards, especially tools and hoses.

Harvesting garden produce

- Use clean containers that are made from materials designed specifically to safely hold food. Examples include paper grocery bags, 5-gallon food-grade buckets (that held pickles or other food products), colanders or plastic kitchen bowls. Plastic garbage bags, trash cans, and any containers that originally held chemicals such as household cleaners or pesticides are not food-grade.
- Wash hands before and after picking produce. Use clean gloves (that have not been used to stir compost or pull weeds) or clean hands when picking produce.
- Brush, shake or rub off any excess garden soil or debris before putting the produce into the harvest container or bringing produce into the kitchen.

Storing garden produce

- It is not recommended to wash fruits and vegetables before refrigerating, but to wash them immediately before eating or preparing for cooking. Refrigerating fruits and vegetables with moisture from washing can encourage microbial growth.
- If you choose to wash them before storing, use cool, running tap water and be sure to dry the food thoroughly with a clean paper towel or air dry. Produce with thick skins, like potatoes, can be scrubbed with a vegetable brush to remove excess dirt and bacteria. Wash berries **immediately** before eating or cooking. Berries that are washed and then stored in the refrigerator will soon become moldy.
- If you choose to store food without washing, shake, rub or brush off any garden soil with a paper towel or soft brush while still outside. Store unwashed produce in plastic bags or containers.
- Keep fruit and vegetable bins in the refrigerator clean.
- If you store fruits and vegetables in the refrigerator, use a thermometer to check that your refrigerator is at the proper temperature (40 degrees F. or less).
- Fruits and vegetables stored at room temperature (onions, potatoes) should be kept in a cool, dry, pest-free, well-ventilated area separate from household chemicals.
- Bruised or damaged parts of fruits and vegetables should be cut away before eating or preparing. Throw moldy produce away.

Preparing and serving fresh garden produce

- Delicious garden produce is often eaten raw so it's important to prepare raw fruits and vegetables with food safety in mind.
- Always wash hands before handling raw fruits and vegetables.
- Rinse fresh fruits and vegetables under cool, running, clean tap water even if you don't eat the skin or rind.
- Never use soap, detergent, or bleach solution to wash fruits and vegetables. These products are not meant for washing produce and may not be safe to ingest. They can also adversely affect the flavor.
- Avoid cross-contamination when preparing fruits and vegetables. Clean work surfaces, utensils, and hands before and after handling fruits and vegetables. Diluted household bleach (1 teaspoon in 4 cups of room temperature water) is safe and effective for sanitizing work surfaces. Let utensils and surfaces air dry.
- If you have leftover produce that has been cut, sliced, or cooked, store it in a clean, air-tight container in the refrigerator at 40 degrees F. or less. To be safe, do not use fresh, cut-up fruits and vegetables if they have been held longer than 2 hours at room temperature or longer than one hour at temperatures above 90 degrees F., unless you intend to cook them.

Resources:

- University of Maryland Extension Home and Garden Information Center (for all gardening and pest questions and problems)
    - Send an e-mail question (and photos) 24/7 through the web site: http://extension.umd.edu/hgic Click the Ask Maryland's Garden Experts icon.
    - Download HG #110, "Selecting and Using a Soil testing Laboratory", and HG #18 "Lead in Garden Soil".
- University of Maryland Extension Grow It Eat It campaign- http://extension.umd.edu/growit
- University of Maryland Extension Maryland Master Gardener Program http://extension.umd.edu/mg
- National GAPS (Good Agricultural Practices) Education Materials http://www.gaps.cornell.edu/educationalmaterials.html
- University of California, Davis – Postharvest Technology Research & Information Center. "Storing Fresh Fruits and Vegetables for Better Taste." http://postharvest.ucdavis.edu/datastorefiles/234-13.pdf
- www.foodsafety.gov – "Your gateway to federal food safety information."

Adapted from:

1. "Garden to Table: Five Steps to Food-Safe Fruit and Vegetable Home Gardening", New England NIFSI grant(Universities of Connecticut, Maine, Massachusetts, New Hamphire,Rhode Island, and Vermont) funded project of the USDA, 2003-5111001713 . Project directors Lori F. Pivarnik and Martha S. Patnoad, University of Rhode Island Cooperative Extension Food safety Education Program. http://extension.unh.edu/news/2007/07/garden_to_table_five_steps_to.html
2. "Food Safety in Your Home Vegetable Garden", by Pamela Geisel and Donna Seaver. Publication # 8366. University of California Agriculture and Natural Resources: http://anrcatalog.ucdavis.edu/FoodSafety/8366.aspx
3. "Checklist for Starting a School Garden", by Dorothy Mullen, Rutgers Extension Master Gardener-www.suppersforsobriety.org/Documents/Garden/SchoolGardenChecklist.pdf

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www.groweat.blogspot.com

Get answers to gardening questions and problems—Send us e-mail questions 24/7 through the website. **http://extension.umd.edu/hgic** and click the **Ask Maryland's Garden Experts** icon.

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