Nevada School Garden

Safety Guidelines

Revised December 2016

Farm to School Program

Plant Industry Division

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For additional resources and forms check the NDA Farm to School website:
http://agri.nv.gov/Plant/FTS-FSP/School_Garden/

Introduction

School gardens engage students by providing a dynamic environment to observe, discover, experiment, nurture and learn. They are living laboratories where interdisciplinary lessons are drawn from real life experiences, encouraging students to become active participants in the learning process. School gardens have been shown to increase self-esteem, help students develop a sense of ownership and responsibility, and promote healthy lifestyle choices, including increased fruit and vegetable consumption.

Food Safety is an element that must be addressed when implementing school gardens and potential food safety risks should be taken seriously. Produce grown in school gardens can be contaminated at any stage, resulting in foodborne illness: during growth, harvest, transportation, preparation or service. When appropriate food safety precautions are taken, risks of foodborne illness and crop contamination are reduced. The following guidelines are intended to help those working in school gardens ensure proper precautions are followed throughout the gardening process to minimize food safety risks.

Good Agricultural Practices (GAP) and Good Handling Practices (GHP) are effective food safety methods for reducing foodborne illness risks within school gardens and in commercial production. The basic principles for GAP/GHP are to prevent the introduction of pathogens into the garden and help garden leaders and students identify potential points of contamination when producing and harvesting garden produce.

This handbook provides an overview of food safety practices, based on GAP/GHP, which can be taken to reduce the risks of produce contamination in school gardens. Additional resources are also provided throughout the document to help teachers, volunteers and students successfully grow and harvest safe produce.

This handbook should to be used as a guide and/or model for schools to create their own standard operating procedures (SOP) for food safety in their garden.

Before beginning work in the garden:

Before work begins, the following food safety concerns should be addressed:

1. Review the Nevada Department of Agriculture's (NDA) School Garden Food Safety Guidelines and School Garden Checklist. Be sure to complete the checklist routinely throughout the growing season, particularly during garden activities. (the checklist can be found on our website under resources: http://agri.nv.gov/Plant/FTS-FSP/School_Garden/)
2. Train all persons on food safety and gardening safety practices, including: staff, students and volunteers. Training should include but not be limited to:

- Handwashing and personal hygiene
- Cleaning and sanitizing garden equipment and containers to store produce
- Proper methods for handling produce
- What to do in case of an emergency, injury, allergic reaction, etc.

3. Check to ensure your school has a permitted kitchen facility. If not, pre-approval for your standard operating procedure explaining how and where the produce grown could be handled and stored must be submitted to your local health authority for approval prior to beginning the program. This is particularly important when cutting or altering the product.
4. Ensure that volunteers are covered by the school district insurance policy in the event of accident, injury, or illness. Check with your school regarding volunteer requirements when on school property.
5. Require signed permission slips for all students involved in the garden.
   -Permission slips should list potential hazards of working in a school garden and identify any allergies the child may have.
6. Do not allow anyone to work in the garden while sick, or until 24 hours after symptoms such as vomiting or diarrhea, have subsided. Food handlers must wait 48 hours, 72 hours if there's a gastrointestinal related illness.
7. If the harvested produce will be sold, a producer certificate must be obtained from the NDA. More information about producer certificates is available at http://agri.nv.gov/producer_certificate/.

Growing

Site selection is important and can be challenging. Ensuring the site has access to approved water sources and good soil composition can help establish a successful school garden. Appropriate permission for a garden must be obtained, taking into account local laws and regulations involving urban agriculture; and will include having written consent from the school administration and school district.

The site must be positioned to protect it from runoff from industrial and agricultural areas, parking lots, roads, or other sources of potential contamination. The site must be protected from domestic and/or wild animals.

Obtaining the garden site history may provide insight into potential hazards such as previous flooding, use as garbage site, chemical storage, animal grazing, animal housing or animal feedlots. If official site history is unavailable, a visual site assessment should be performed to determine potential food safety risks. Make sure to check for traces of animal tracks/droppings and check flooding potential.

Construction materials

When constructing raised beds, containers, stakes, and trellises, use only non-toxic and non-leaching material such as concrete and untreated wood. Do not use pressure-treated wood, used tires, railroad ties, or single use plastics in the school garden. Do not use products coated with lead-based paint or other potentially contaminated coating.

Soil composition

Soil nutrient tests should be conducted before the garden is built. Testing should include levels of:

- Plant nutrients
- Micronutrients
- pH
- Soil type
- Contaminants (chemicals, pesticides, lead, etc.) Potential contaminants should be assessed based on previous land use.

Information on local resources available for soil testing can be found under the Resource section at http://agri.nv.gov/Plant/FTS-FSP/School_Garden/.

Plant selection

Select plants that perform well in your area and that have growing cycles that fall within the school year's schedule. Be aware of potential allergens and do not bring products or grow crops of common severe such as peanuts or soybeans. Inform students the vegetative parts of fruits and vegetables. Make sure it is known what not to eat to avoid toxicity in humans.

Chemical and fertilizer use

Do not use any pesticides or herbicides in school gardens due to potential health hazards. Make sure to secure all fertilizer in a safe and locked location when not in use. Fertilizer should only be handled by an authorized adult when children are not present. Do not use raw animal manure in the garden as fertilizer due to microbial concerns if not handled treated, and stored properly or if applied too closely to harvest.

Water and Irrigation

Only potable (drinking) water may be used for irrigation. Ensure water meets Nevada Department of Environmental Protection Bureau of Safe Drinking Water requirements and is not

compromised by cross-contamination. This can be identified by searching records here: https://ndwis.ndep.nv.gov/DWW/. If unable to use water from an approved and permitted public water sources, a water test must be obtained from a reputable lab facility for private wells. Test for a numerical value of total coliform and whether water source is considered potable. If transporting potable water, only food grade container are to be used to ensure they can be properly sanitized.

Be sure that irrigation water is accessible during the entire growing season. Some schools may turn off irrigation water before the growing season is over. Hoses/irrigation systems must have backflow preventers or air gaps in place. Irrigation hoses should be made of material that won't contaminate the water running through the hose. Rain water collection must not be used for irrigating edible crops. Rain water may directly contact surfaces that contain harmful metals or other contaminants. Storage containers may also attract pests if not stored properly.

Water tests must indicate whether generic E.coli are present which must not exceed 126 Colony Forming Units (CFU) per 100mL of water. Information on local resources that are available for water testing can be found under the Resources section http://agri.nv.gov/Plant/FTS-FSP/School_Garden/.

Aquaponic and hydroponic water conditions

Due to the growing habitats of aquaponics and hydroponic gardens, water safety must be a top priority. Water must be tested routinely to ensure no contamination is present. Aquaponic gardens may not grow directly on top of fish tanks. Water from the fish tanks must be filtered and sanitized before using in the plant beds. The water from fish tanks also must not come in contact with the edible portions of the plant.

Compost

Only use plant based compost and do not use animal products since they can introduce harmful pathogens. Animal manure can create a high risk of pathogen contamination in the garden when not properly treated, aged, handled, or applied. Have an individual trained in composting practices to oversee the compost.

Best compost practices include:

1. For thermal composting- must achieve a temperature of at least >130 degrees Fahrenheit for 3 months of curing.
   Non-thermal composting (cold) - must cure for at least>6 months.
2. No harmful plants (noxious weeds) or diseased material should be used.
3. Avoid grass clippings or leaves to avoid contamination.
4. The compost pile must be properly rotated to introduce air into the compost.

5. Balance of carbon and nitrogen sources- as a general rule use 3 parts carbon sources to 1 part nitrogen sources. For nitrogen and carbon composting sources see: http://web.extension.illinois.edu/homecompost/materials.cfm
6. Locate compost pile downhill and away from the garden to prevent run-off. Also place in a location that restricts access by animals and contamination by garbage.
7. Wear gloves while handling compost material.
8. If using cafeteria waste products, have documentation of proper training of what can/cannot be included. Make sure compost stations are monitored during meal time to ensure proper items are being composted.
9. Organic matter must be fully composted before adding to garden or it will compete with plants for nitrogen.

Consider using worms to form vermicompost. Learn about vermicomposting at http://www.bae.ncsu.edu/_topic/vermicomposting/. Animal products still must not be used in feed since there is research that suggest worms cannot breakdown some harmful pathogens.

Additional information on composting can be found under the Resources tab http://agri.nv.gov/Plant/FTS-FSP/School_Garden/.

Harvest

Preparation for harvest

Before harvesting, coordinate with site staff to set a harvest time. Signed permission slips for all student gardeners prior to working/harvesting in the garden must be collected. The permission slips should include:

- List of potential hazards while working in the garden
- Any allergies the child may have
- Basic hygiene requirements (hand washing, clothing requirements, illness etc.)

Determine when kitchen staff is available to accept school garden product. The day of a harvest, the garden leader should check with the kitchen manager or staff to pick up the clean, sanitized food grade container. The garden leader should survey the school garden for vegetables and fruits that are ready to pick. The garden leader must prepare documentation to record where the items were harvested, date, temperature, and who harvested produce. See Forms tab http://agri.nv.gov/Plant/FTS-FSP/School_Garden/ for an example.

Personal hygiene

Personal hygiene is very important in food safety. When harvesting the following procedures/facilities should be in place:

1. Hand washing facilities must be available for all garden workers and students.
    - Hands must be washed with soap and water for a minimum of 20 seconds before entering the garden and anytime they become contaminated or visibly dirty while working in the garden.
    - Hand sanitizer is not an acceptable substitute for proper hand washing.
    - Use liquid or foam soap.
    - Hands must be dried with paper towels or air dryer. Shared clothes must not be used.
2. Restrooms must be available to all garden workers and students.
3. Proper clothing suitable for gardening must be worn.
    - This includes closed toed shoes.
4. Do not allow anyone to work in the garden if they are experiencing vomiting, diarrhea, sore throat with fever, jaundice, abdominal cramps, or have experienced a loss of appetite for 3 or more consecutive days. Do not allow anyone to work in the garden or handle produce until 24 hours after last symptoms have occurred. Document any removal of staff/student due to illness. A sample of this document can be found in the resources section http://agri.nv.gov/Plant/FTS-FSP/School_Garden/.
5. Do not allow anyone with open cuts or wounds to handle the produce.

Harvesting the school garden with students

The garden leader or approved volunteer should recruit a small group of students, ensuring the participants are free of illness, have signed permission slips, and are practicing proper personal hygiene requirements. The garden leader should give instruction to the participants about garden procedures and proper food safety (i.e. proper hand washing, and utensil sanitizing).

Once the students and staff have washed their hands, the garden leader can then show the students which foods are ready to pick. Show the students how to brush off excess soil before placing items into sanitized food grade containers. Do not harvest any produce contaminated by animals, bodily fluid, glass, chemicals, or insects. Document any removal of contaminated produce/plants.

Students can help the garden leader by documenting the following:

- Date and time of harvest
- Location in garden of the harvested produce

- Type and number/weight of each vegetable or fruit harvested.
- Name of garden leader and students involved

Students and garden leader must take vegetables immediately to kitchen staff after harvest.

For additional information regarding food handling requirements contact your local health authority.

Post-Harvest

On-site food safety guidelines and procedures must be followed for all school garden items served in the cafeteria. The kitchen staff must inspect the produce upon delivery and reject if it has been contaminated by animals, bodily fluid, chemicals, and/or insects. A record of produce received and discarded should be kept by kitchen staff.

Produce must be washed in a clean, sanitized sink with potable water. Immediately after washing, produce must be refrigerated to 40 degrees Fahrenheit within two hours. Room temperature stored produce should be kept in a cool, dry, pest-free, well-ventilated area and stored off the ground. Make sure produce is not wet before storage. Document produce that is washed to ensure to separation from produce that is unwashed.

Produce should be consumed with in three to five days of harvest.