



Post-Harvest: Fall Clean-up

Lesson Two:

What do you do with the garden after the harvest?

For October

“Putting Your Garden to Bed” from Healthy Gardens, Healthy Youth Content and Delivery Team and Composting from GARDEN MOSAICS, American Community Gardening Association and Cornell Garden-based Learning.

It’s time to put the garden to bed, if you didn’t do that last month. Students learn about tool safety, cover cropping and composting. Included are options to building your own compost bin, and plant a winter crop.

Content objectives:

Describe how gardeners and farmers care for the soil so that they can grow healthy, edible crops during the next growing; identify steps to put your garden to bed in a way to prepare the soil for the next harvest; understand how composting improves soil.

Life Skill objectives:

Healthy living, Critical thinking, Communication, Cooperation
Leadership, Decision making, Problem solving

Core and STEM concepts and skills:

Science

Science as inquiry, Earth and space, Life science

Math

Measurement and observation

Language Arts

Speaking, Listening, Writing, Viewing

Social Studies

Behavioral sciences

Healthy snack:

Choose snack from Grade 5 Lesson 1 options

Additional and supporting resources:

Contact your local Cooperative Extension Master Gardner Program for additional information.



LESSON PLANS FOR 2012-13 SCHOOL YEAR, GRADE 5

October: Post Harvest: What do you do with the garden after the harvest?

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BEFORE THE LESSON

Is it time to put your garden to bed for a while? Do you want to learn how gardeners and farmers care for the soil so that they can grow healthy, edible crops during the next growing season? All of the following items will help you put your garden to bed in a way to prepare the soil for the next harvest. Garden experts say that if you could choose one thing to do to improve your garden for the next growing season, building a compost pile or bin would be your wisest decision. Extension Master Gardeners and other local garden experts can help you to do that.

1. Grade 3, October: Post Harvest

This document contains all the curriculum items and resources you need for this lesson. All lesson downloads are located on the www.peoplesgarden.wsu.edu Educational Toolkit.

2. Put Your Garden To Bed, University of Maryland Extension

Improve Your Soil with Cover Crops, Cornell University Department of Horticulture **Questions About Composting**, Iowa State University Extension and Outreach

Tool Safety Game, Iowa State University Extension and Outreach, *Growing in the Garden* Please read and use these resources as guides for post harvest gardening activities. You may copy these resources to send home with the students.

3. Garden Records or Garden Journals

Start a page for the garden records or garden journals to describe or draw your post harvest activities. You may want to start the page with the goals you want to accomplish to prepare the garden for next year. Then explain how you think the post harvest activities will help you to reach your goals. If you haven't started a Garden Journal, this would be a good time.

4. Post - Harvest Recipes

Select a recipe from the Grade 5 September lesson *Harvest Sampling Ideas and Recipes* that includes garden produce you have harvested or fresh produce that could be from a garden near where you live. Be prepared to have the students help to prepare and eat it.

THE LESSONS

Because every garden and gardening situation is different, the first part of this lesson requires you to read the resources from Before the Lesson, Item 2 and then choose the activities and tools that your students will use to actually put their garden to bed. Please highlight the activities and tools that are most appropriate for your location, garden, and students. Then you are ready to work with the students to actually put their garden to bed for the season. This should take one session. If you do not have a garden to put to bed, you can tour local gardens or even farm fields to observe what is going on and you can discuss what you would do in a garden.

Part Two of this lesson will include composting activities done on another day.

1. Part One: Putting Your Garden to Bed

A. What can your students do from the "**Put Your Garden to Bed**" resource to actually put their garden to bed? Highlight the activities that seem to match your garden situation and think about how the students can do those activities.

B. Do you want to try cover cropping from "**Improving Your Soil with Cover Crops**"? You may want to ask Master Gardeners or local garden experts if that is a good idea and what cover crop to plant in your location. It is difficult to till the cover crops back into the soil in a raised bed. If this is a workable option for your gardens, select the appropriate cover crop and be ready to have the students plant it.

C. Do you want to build a compost bin to do something with the plants left from harvest and to improve the soil for next year? "**Questions About Composting**" will help you to decide. The students will learn more about composting in Part Two of this lesson. If a compost bin is not quite ready when you are putting the garden to bed, pile the plants in a place to add to your compost bin in the future.

D. Review the student activities that you highlighted and consider the tools they will be using for those gardening activities. Look for those tools in the "**Tool Safety Game**" and play the game before the students work together to put their garden to bed.

2. Part Two: Composting

This lesson from Garden Mosaics (page 11) defines and describe composting and introduces a way to put together a simple compost bin. You may want to work with Master Gardeners or other experienced gardeners to decide what type of a composting bin would work best for your site. The students can help to assemble and start the composting project. Consider collaborating with other classrooms on this project or expanding the composting project to the entire school.

3. You may want to expand the lesson by inviting someone from your city or county to talk about the composting that they do. Ask local gardeners about the impact of composting on the plants that they grow. Share what you have learned through posters that you can display around town to encourage people to compost.

AFTER THE LESSON

Keep composting!

You may want to tour some gardens, fields, composting projects in your area.

Put Your Garden To Bed

By Pamela B. King
Charles County, Maryland Extension Agent

When Fall crops and flowers have matured, it is time to put your garden to bed. Get started with these tips for cleaning your garden, setting it right for the winter, and laying the groundwork for next year's garden:

- Plant perennial rhubarb roots October 15 through November 15. Plant Spring flowering bulbs, such as tulips and daffodils, in October. Other perennial flowers, such as peonies, do best when planted in the fall, too.
- Pot up parsley, chives, geraniums and other herbs and flowers. Keep them out of doors for a few weeks in their pots. Then bring them in and place them in a sunny window for production throughout the winter.
- Harvest and preserve fall crops.
- Cover tomatoes and other warm season crops with plastic in the evening to protect them from light frosts. Remove the plastic in the morning so heat does not build up under it and damage the plants.
- Mulch and protect hardy crops, such as greens and root crops, so they will last longer. Pile mulch over and around plants to insulate them.
- Remove old, spent plants from the garden. Any plants that had insects or disease should be put in plastic bags and thrown out with the trash. Others can be composted.
- Make needed structural changes, such as leveling or building raised beds. Turn the soil and leave it rough to expose insects and disease to the cold. It will kill some of them.
- Mow tall grasses around the garden and use them (or other materials) to mulch the ground before it begins to freeze (late November) to prevent erosion.
- Take a soil test and add any needed limestone to the garden so it will break down and do its job by spring.
- Wait until spring to fertilize.
- Make compost from fallen leaves, kitchen vegetable scraps, garden waste, and other organic matter in an enclosed container. Call the Extension Service for directions on making compost.
- Add organic matter (compost, leaves, grass clippings) to improve the condition of the soil.
- Be sure to clean up your garden so it will look neat and clean for the winter.

Now sit back and wait for your seed catalogues to come and start planning for next season.

From: University of Maryland Extension

http://mastergardener.umd.edu/local/charles/Horticulture%20Know_how/Put%20Your%20Garden%20to%20Bed.cfm Accessed 8/1/2012

Cornell gardening resources

Improve Your Soil with Cover Crops

Ecogardening Factsheet #9, Spring 1993

At the end of the growing season you may be ready to rest, but your garden is not. One final effort can make a big difference: cover cropping. Even small gardens will benefit from the use of cover crops, or "green manures". Tilling, weeding, harvesting and foot traffic of most home gardens tends to destroy soil structure. Planting cover crops is an easy way to revitalize the soil, and help soil tilth and subsequent plant growth. Cover crops are planted in vacant space and worked into the soil after they grow instead of being eaten. They provide a number of advantages to the otherwise wasteful use of space during your garden's off-season.

Cover crops help to retain the soil, lessen erosion, and decrease the impact of precipitation on the garden by slowing the runoff of water. They also reduce mineral leaching and compaction, and suppress perennial and winter annual weed growth. The top growth adds organic matter when it is tilled into the garden soil. The cover crop's root system also provides organic matter and opens passageways that help improve air and water movement in the soil.

Success in the growth of cover crops requires proper selection of the kind of cover crop, correct timing of seeding, and good management techniques. There are many traditional cover crops to select from, including annual ryegrass, winter rye, winter wheat, oats, white clover, sweet clover, hairy vetch and buckwheat. Grasses are easier to grow than legumes such as clover because they germinate more quickly and do not require inoculation. Small seeded crops are more difficult to establish than large seeded types such as oats and buckwheat. In poorly drained areas, grasses may be easier to get started. Winter rye and ryegrass grow in a very dense habit and are much more effective at shading out weeds than oats or small seeded legumes. Availability of seed and cost are other important considerations.

If sections of the garden are free during late spring or early summer, clovers, fescue or buckwheat can be planted. If garden space is available in August, barley, annual ryegrass, oats, and clover can be successfully established. The last date when cover crops can be planted in New York will vary with the region, but most New York gardeners should plan to plant cover crops by the end of September. By the beginning of October, only rye and winter wheat can be productively started.

Cover crops such as annual ryegrass, oats, and buckwheat do not overwinter. These crops are the easiest to work with when spring arrives since their tops have died back during the winter. Perennial ryegrass and winter rye produce a massive amount of top growth in the spring and may be difficult to incorporate. However, perennial grasses are an advantage in wet areas, since the soil will dry more rapidly than a soil with winterkilled crops. If this is the case, before the leaves grow too tall in the spring they should be cut back once with a mower or scythe.

Given all of the above information, how does one choose? For New York conditions, annual ryegrass should be considered first for a garden cover crop. It is a vigorous grower with an extensive root system that occupies the same root zone as the garden plants. Winter rye is another good choice that is best for late planting.

To plant a cover crop, rake the garden area smooth and remove debris or large stones. Broadcast the seed according to the rates on the chart below. Lightly rake again, and water in the cover crop with your hose set at a fine mist.

The following chart provides an overview of the cover crops at a glance. Seed can be purchased at your local garden center or farm store.

POPULAR AND USEFUL CHOICES OF COVER CROPS									
	Vigor of germination & establishment	Seed cost to plant (1000 sq.ft)	Time of planting	Over-winter ability	Growth amount	Ease of incorporation	Soil structure improvement	Applic. rate; oz/100sq ft	Comments
Annual Ryegrass	***	*	Aug - Sept	NO	**	**	***	2	Overall an easy crop to establish
Perennial Ryegrass	**	**	Aug-mid Sept	***	**	*	**	1	Faster establishment than other perennials. Extensive root system
Winter Rye	***	**	Aug - Oct	***	***	*	**	3	Can Grow at low pH and at cool temperatures
Oats	***	**	Aug - Sept	NO	*	***	*	4	Requires good soil drainage, but tolerates low pH
Winter Wheat	***	**	Aug - Oct	***	***	*	**	3	Requires fertile soil; avoid wet or low pH soil

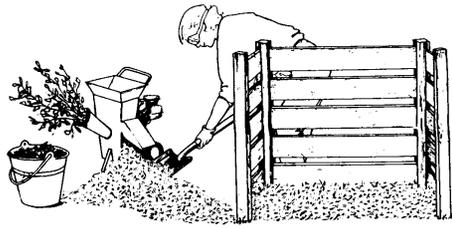
Sweet Clover	*	*	Summer	***	***	**	**	1	Better with high pH than other clovers
White Clover	*	*(*)	Summer	***	*	***	**	1	Good for low pH soil, treat with inoculant
Tall Fescue	*	***	Spring	***	*	**	**	1	Persistent, may become weedlike
Buckwheat	***	**	Spring	NO	**	***	*	3	Do not allow to mature, or reseeding will occur
*** = Relatively High			** = Moderate				* = Relatively Low		
Note: Packages of Ryegrass Usually Contain a Mixture of Annual & Perennial Types									

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How long does it take to reach a finished product?

Generally, a compost pile that contains a good mixture of finely chopped materials, is turned regularly and kept moist, will be ready in about 2 to 4 months. A compost pile composed of non-shredded materials that is left unattended may take a year or longer to decompose. Piles prepared in late fall will not be very well decomposed by spring. When the compost is finished, the pile will be about half its original size and have a pleasant, earthy smell.



Of what value or use is the finished compost product?

Compost is used as an organic amendment to improve the physical, chemical and biological properties of soils. For example, adding compost to garden soil will increase the moisture holding capacity of sandy soils and improve the drainage and aeration of heavy clay soils. Over time, yearly additions of compost will create desirable soil structure making the soil easier to work.

Will compost eliminate the need for commercial fertilizers in my garden?

To a limited extent, compost is a source of nutrients. However, nutrient release from compost is slow and the nutrient content is often too low to supply all the nutrients necessary for plant growth. Compost should not be considered a substitute for fertilizer, but rather a supplement. Compost increases the ability of the soil to hold and release essential plant nutrients, especially in sandy soils. This may reduce the amount of fertilizers needed.

For more information

Horticultural information is available from your local Iowa State University Extension office and from these Web sites.

ISU Extension Distribution Center—
www.extension.iastate.edu/store

ISU Horticulture—
www.yardandgarden.extension.iastate.edu

Reiman Gardens—
www.reimangardens.iastate.edu

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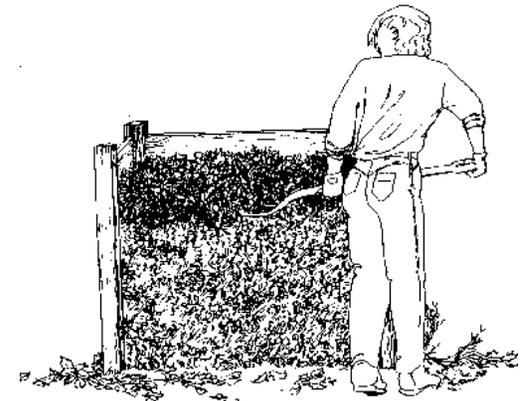
Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Jack M. Payne, director, Cooperative Extension Service, Iowa State University of Science and Technology, Ames, Iowa.

... and justice for all

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Questions About Composting



IOWA STATE UNIVERSITY

University Extension

The Iowa Waste Reduction and Recycling Act of 1989 prohibited the disposal of yard wastes in sanitary landfills. This encouraged many gardeners and homeowners to try composting their leaves, grass clippings, and garden refuse. Although the process of composting is not difficult, some gardeners simply created “organic trash heaps” and became discouraged because the plant material in their pile did not readily decompose.

Below are a few of the commonly asked questions about composting.

What kinds of materials can be composted?

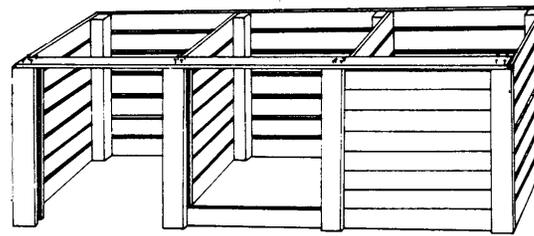
Yard and garden residues and other organic materials are suitable for composting. This includes leaves, grass clippings, straw and hay, sawdust, and finely chopped or shredded tree and shrub prunings.

Can kitchen scraps be added to a compost pile?

Certain kitchen scraps can be added to the compost pile, such as fruit and vegetable trimmings (including rhubarb leaves), coffee grounds and eggshells. Bury them in the pile to prevent odors and flies. Do not add meat scraps, bones, grease, whole eggs, or dairy products to the compost pile because they decompose slowly, cause odors, and can attract rodents.

What other things shouldn't be added to a compost pile?

Because of the possibility of the transmission of certain diseases, human, dog, and cat feces should not be placed in compost piles. Also, diseased plant material or weeds that have gone to seed may be undesirable in the compost pile. If the temperature in the pile does not reach 150° to 160°F, neither the weed seeds nor the disease organisms will be destroyed. If diseased plant materials are composted, the end product may be better used in another area of the yard rather than in the garden where they were generated.



For more information and instructions for building a stationary 3-bin compost turning unit, see “Composting Yard Waste” (PM 683).

What is the optimum size for a compost pile?

The best size for an enclosed compost pile is between a 3' x 3' x 3' pile and a 5' x 5' x 5' pile. If any smaller, it will dry out too fast; any larger and there will be poor air movement and it will be difficult to turn the pile.

Can wood ashes from the fireplace be used in the compost pile?

Wood ashes act as a lime source and should only be added in small amounts (no more than 1 cup per bushel of compost).

If my lawn has been treated with herbicides, can I still use the clippings in my compost pile?

Composting is an accelerated decomposition process that biodegrades many compounds faster than soil degradation. The faster degradation in an active compost pile is due to the more favorable conditions for decomposition of organic products including herbicides. If yard waste has been composted at least one year, pesticide residues should not be a problem when the compost is used.

Can I compost my newspapers?

Yes. Most newspapers today use soybean-based or other non-toxic inks. To promote decomposition, shred newspapers and mix with other materials.

Why doesn't a pile of leaves readily decompose?

It is best to have a mixture of organic materials together in the compost pile. Dry leaves are a high-carbon organic material. The microbes that do the decomposing require a certain amount of nitrogen for their own metabolism and growth. Without a nitrogen source, the decomposition will be slow. Grass clippings are high in nitrogen. When mixed together, the grass clippings will enhance the decomposition of the leaves.

Are commercially available inoculants or activators needed to have rapid decomposition in a compost pile?

Inoculants are dormant microorganisms. They are rarely needed, since soil, leaves, kitchen scraps, and finished compost already contain ample bacteria that readily work on their own. The only “activator” that may be needed is a nitrogen source since nitrogen is usually the limiting nutrient. Nitrogen accelerates the decomposition process if the materials to be composted are high in carbon, such as dried leaves.

How can I avoid problems with unpleasant odors from the compost pile?

Odors may arise from the addition of excessive amounts of wet plant materials such as fruits or grass clippings, from overwatering the pile, or by not periodically turning an actively decomposing pile. A properly prepared and adequately turned compost pile will generate little, if any, objectionable odor. Good aeration, provided by regularly turning over the materials in the pile, is essential for good, rapid decomposition. Also, keeping the compost damp but not waterlogged will go a long way toward preventing unpleasant odors. Adding lime does not necessarily reduce odors and may result in the loss of nitrogen from the pile.

TOOL SAFETY GAME

I am going to show you some right ways and wrong ways to use and store our tools. If you think I'm showing you the right way, clap. If you think I'm showing you the wrong way, stomp your foot.

- **Lift the hoe so that the blade is over your head like you are swinging a hatchet.**

STOMP.

I have lifted the hoe too high. I am not chopping the soil. I am hoeing it. It doesn't work very well this way. Also, you may hit someone who is nearby if you swing the hoe this high in the air.

- **Lift the hoe so that it is about 1 foot off the ground and bring it down in a gliding motion through the surface of the soil.**

CLAP.

This is the correct way to use the hoe to cut through crusty soil and remove weeds.

- **Repeat the same motions with the rake.**

- **Lay the rake down, teeth up.**

STOMP.

You should never set a rake or a hoe on the ground like this. What do you think would happen? You may want to demonstrate what would happen if someone stepped on the teeth of the rake or blade of the hoe. Be careful to stand to the side so the handle doesn't smack you in the face.

- **Stand the rake and hoe, handles up, against a wall or hang them.**

CLAP.

Rakes and hoes should be stood against a wall or in the shed or garage when they are not being used.

- **Walk with the trowel blade up.**

STOMP.

Always carry your tools such as this trowel with the sharp blade facing down.

- **Run a short distance holding a hoe and a trowel.**

STOMP.

Never run with tools in your hands.

- **Pretend to wash dirt from the trowel, hoe, or shovel.**

CLAP.

It is always a good idea to clean the soil off your tools before you put them away. This shows you are responsible for taking care of your tools.

- **Pretend to fight with a student over a trowel or hoe.**

STOMP.

Show respect by taking turns.



COMPOSTING Teaching Tips



LEARNING OBJECTIVES

Youth will be able to:

- * Define composting.
- * Describe what compost organisms need to grow and multiply.
- * Explain how to build and care for a compost pile.



HOW TO USE THE COMPOSTING SCIENCE PAGE

Ask youth what happens to their household food scraps, yard trimmings, and fallen leaves. Explain that these organic materials make up 20-40% of the total wastes that go to landfills and incinerators in the U.S. Yet these valuable resources could be composted to produce a soil amendment that can greatly improve garden soil.

Show youth various materials, some of which can be composted (for example, leaves, newspaper, and kitchen scraps) and others (for example, metal and plastics) which cannot decompose. Have the youth separate the materials into two piles, one with items that will decay, and another with items that will not decompose.

Show youth some finished compost. Let them feel and smell the compost. Ask: How did kitchen scraps and other compost materials become this rich, dark brown, sweet-smelling compost? (Answer: Microbes and physical processes (e.g., heat) broke down the materials into compost.)

Pick up a handful of compost, and tell youth that you are holding more microbes than there are people living on the earth. Although these microbes cannot be seen, evidence of their growth can be observed. If all of their needs are met, microbes grow and multiply very quickly, and turn vegetable scraps and yard wastes into compost. Tell youth that the Science Page contains information on what compost organisms need in order to produce compost.

Emphasize that the more ideal the conditions are for microbes in a compost pile, the faster the decay process. A compost pile can take from several days to several months to finish composting. Turning the pile will help ensure that all parts of the pile have enough air and moisture, which will speed up the decay process.

Explain that brown materials are usually much drier than the food scraps and other green materials in a compost pile. So they help to balance the moisture in a compost pile as well as provide carbon-rich food for microbes. The browns are also usually coarser than the greens, so they create a porous structure that allows air into the pile, and excess water to escape. Warn youth not to include meat, oily materials, dairy products, or bones in the green layers. They may attract pests to the compost pile.

A comprehensive guide for high school students interested in composting research projects is: Trautmann, N.M. and Krasny, M.E. (1998). Composting in the Classroom Scientific Inquiry for High School Students. Kendall/Hunt Publishing Company. Dubuque, Iowa. (ISBN: 1 577 53038 1)

A useful publication for upper elementary and middle school students is: Bonhotal, J.F. and Krasny, M.E. (1994) Composting: Wastes to Resources. Cornell University Cornell Cooperative Extension. 2nd ed. (ISBN: 0 787 24433 3)



CROSSWORD PUZZLE

Answers: Across: 2. browns; 4. compost; 6. heat; 7. three. Down: 1. bacteria; 3. water; 5. greens.



TRY THIS

Ask youth to keep a pail or other container in their kitchen for collecting food scraps. Line the container with newspaper to make

it easier to empty and to clean.

Ask: What items can you collect in your compost bucket? (Answer: Vegetable or fruit scraps, coffee grounds, tea bags, and crushed egg shells.) Ask: What items should not be put in the compost bucket? (Answer: meat, fat, dairy products, bones, or raw eggs.) Explain that cutting up the food scraps into smaller pieces will make them rot faster.

Discuss where you can find local sources of browns, such as straw, dried leaves, sawdust, or newspaper. Remind youth that they need to have three times as many browns as greens. Ask everyone to collect and bring in greens and browns to add to the compost pile.

Emphasize the importance of size of the compost pile. Ask: What would happen if the compost pile were smaller than one cubic meter? (Answer: It would lose heat, so the composting process would be slowed down.) Talk about the importance of moisture and air in the pile. Ask: How can we make sure that the compost organisms have enough air and moisture? (Answer: Make sure the pile stays as moist as a damp sponge. Turn it at least once a week so that all parts of the pile get enough moisture and air.)

Schedule times for youth to turn the pile once a week. Once the compost is finished, youth may wish to use it in a garden, or for potted plants.



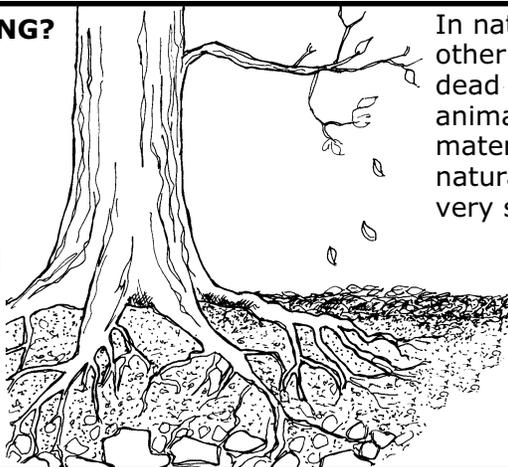
SPOTLIGHT ON RESEARCH

The information for this Spotlight is from: Rangarajan, A., Tuttle McGrath, M., and Blomgren, T. "Evaluation of Two Commercially Available Composts for Managing Phytophthora Fruit Rot of Pumpkin." New York State IPM Program, Cornell University, Ithaca, NY. 2001. <www.hort.cornell.edu/extension/commercial/vegetables/online/2001veg/pdfs/text/IPMfinalreportPumpkins.pdf>

COMPOSTING Science Page

WHAT IS COMPOSTING?

Composting is the controlled decay of plant and animal matter to produce compost—a dark, rich soil-like material. Compost can be added to soil to improve its structure and nutrient content.



In nature, bacteria, fungi, worms, and other soil organisms help to break down dead plants and animals, as well as animal wastes. The decomposed organic material becomes part of the soil. This natural decay process usually takes place very slowly.

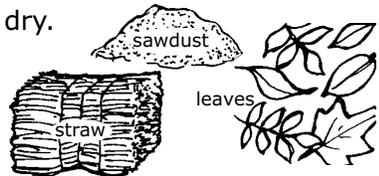
Leaves that fall to the forest floor slowly decay to form part of the organic matter in soil.

Composters create ideal growing conditions for compost organisms. This speeds up the natural decay process.

WHAT COMPOST ORGANISMS NEED

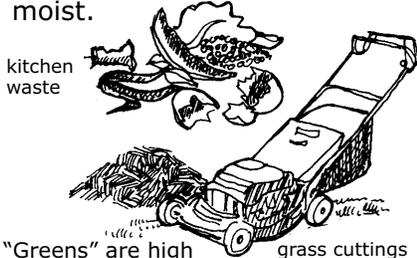
1. A balanced diet of compost materials

"Browns" are compost materials that are brown and dry.



"Browns" are high in carbon, which is energy food for microbes.

"Greens" are compost materials that are green and moist.



"Greens" are high in nitrogen, which microbes need to make proteins.

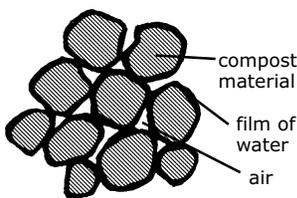
If I add about 3 parts browns to 1 part greens, then the compost organisms will have a balanced diet.



2. Just the right amount of air and water

If there's the right amount of oxygen and moisture, microbes can rapidly grow and multiply. Too much—or too little—water, and microbes will die.

Compost materials should have a thin film of water around them, and lots of pore spaces filled with air.

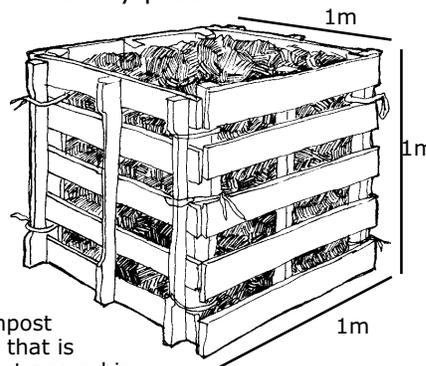


I'm mixing my compost pile so that all the compost organisms get enough air and water.

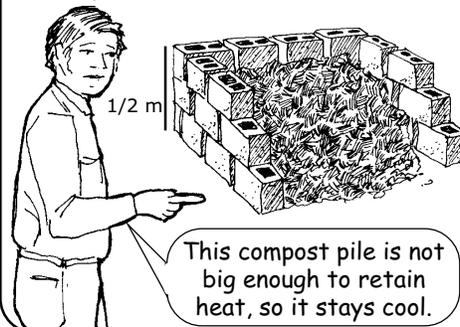


3. The right temperature

Organic materials will eventually decay, even in a cold compost pile. But the decay process is speeded up in a hot compost pile. When bacteria and fungi grow rapidly, they burn a lot of food, and give off a lot of heat. If the compost pile is big enough, the heat will build up inside the pile. Bacteria that grow well at high temperatures take over and speed up the decay process.



A compost pile that is about one cubic meter (1m x 1m x 1m) in size is big enough to hold in heat and warm up.



This compost pile is not big enough to retain heat, so it stays cool.



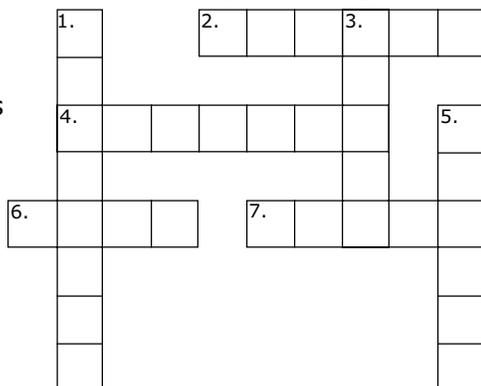
CROSSWORD PUZZLE

Across

- Compost materials that are high in carbon.
- Dark, rich, soil-like material.
- A compost pile should be big enough so _____ builds up inside it.
- A balanced diet for microbes is about _____ parts browns to one part greens.

Down

- Microbes that help break down plant and animal matter.
- Compost organisms need just the right amount of _____.
- Compost materials that microbes use to make proteins.



TRY THIS

BUILD A COMPOST PILE

What you need

- * 3-meter length of wire mesh fencing
- * twist ties
- * wire cutters
- * compost materials
- * duct tape

What to do

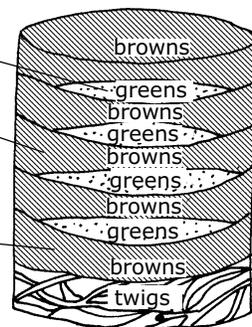
- Choose a site to set up your compost bin. Try to find a shady, well-drained, level place that is convenient.
- Snip off the fencing close to the cross wires and cover the sharp ends with duct tape to avoid getting scratched. Lap the ends of the fencing together and tie together with twist-ties to make a cylinder one meter high and one meter in diameter.
- Put a layer of twigs in the bottom of the bin to help air to reach the center of the pile.
- As you collect compost materials, layer them in the compost pile, as shown in the picture.
- Stir or turn the compost every week or so to let in more air. To reach the compost, undo the twist-ties and open the fencing.
- The length of time it takes for compost to be ready depends on many factors, such as weather conditions, the type of materials included, and the amount of turning. If you want your compost to be finished faster, keep it moist and turn it a couple of times a week. Finished compost is about one-third or

less of its original size, dark brown, and has a nice, earthy odor.

Green layers should be no more than 3-5 cm thick.

Brown layers should be 2-3 times as thick as green layers.

Start with a brown layer, then a green layer, then a brown layer, and so on. Always end with a brown layer so that wastes are covered.



SPOTLIGHT ON RESEARCH

Compost Can Help Control Plant Diseases

Recent research has shown that compost not only improves soil. It can also help to control plant diseases caused by fungi. Fungi that attack plants include molds, rusts, mildews, and smuts. They over-winter in the soil and in plant debris. When the weather is warm, they produce spores, which can be splashed or blown onto wet leaves. Then the spores can germinate and infect plants.

Scientists are testing different composts to find out what types are most effective at suppressing harmful fungi. In one study, a team of scientists tested different composts to see which one would be best for controlling fruit rot in pumpkins. Fruit rot is a serious problem that affects pumpkins, melon, squash, peppers, tomatoes, and eggplants. In greenhouse trials, scientists first screened composts made of several different materials. One product, made from brewery wastes, stood out as very effective. In the following year, the brewery waste compost was applied to two fields where fruit rot had been a big problem in the past. In one field, no disease occurred, and the growth and yield of pumpkins improved a great deal compared to untreated fields. In the other field, the brewery waste compost was not effective in suppressing fruit rot. Scientists think that perhaps there was just too much of the fruit rot fungi present. If brewery compost were added to this field for several more years, then the disease might be suppressed. Time will tell.

Source: Rangarajan, A., Tuttle McGrath, M., and Blomgren, T. (2001). Evaluation of two commercially available composts for managing phytophthora fruit rot of pumpkin. New York IPM Program, Cornell University, Ithaca, NY. <www.hort.cornell.edu/extension/commercial/vegetables/online/2001veg/pdfs/text/IPMfinalreportPumpkins.pdf>



RIDDLE

Why did the gardener bury money in his compost pile?

Answer: Because he wanted his soil to be rich!