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the garden PATH

Extension
UNIVERSITY OF WISCONSIN-MADISON
FOND DU LAC COUNTY

The Fond du Lac County Community Gardens Newsletter

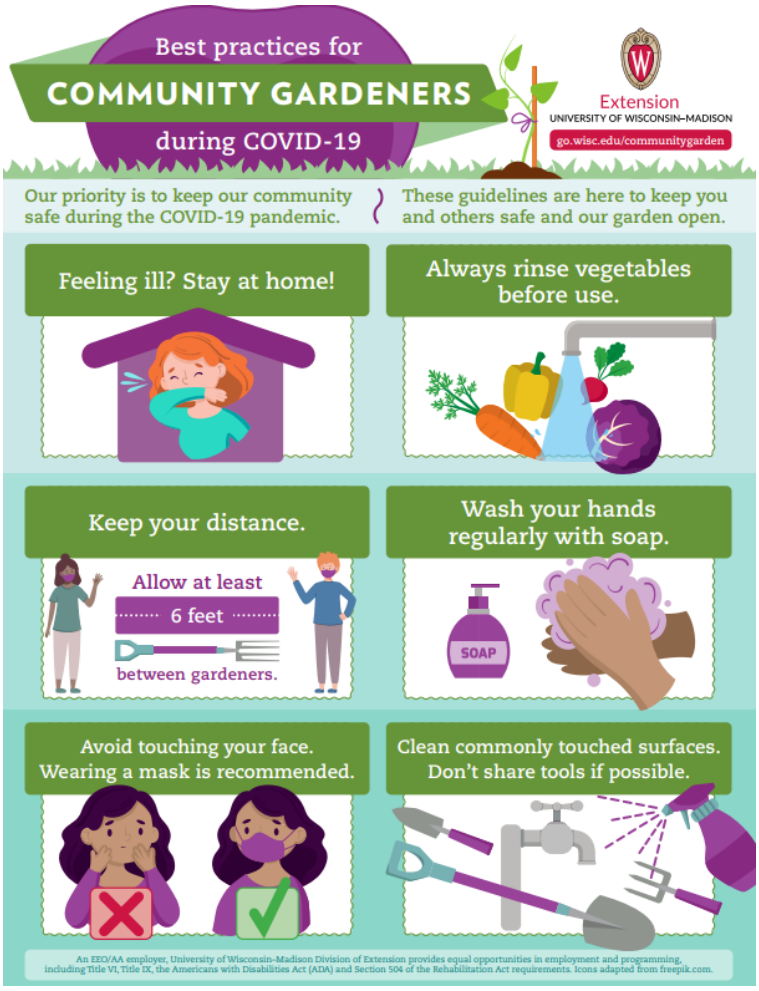
The Garden Path
Summer 2020 Newsletter

"The garden suggests there might be a place where we can meet nature halfway."

- Michael Pollan

Patty's Notes

This year has been an exceptional planting year. Gardens everywhere were tilled and planted earlier this May than we have ever opened. All the gardens are looking exceptional, hope they are producing well for everyone! If you have any specific garden problems or questions, please call the Extension office 920-929-3172, or email at patty.percy@wisc.edu. If I am not in the office, I will respond with needed information as soon as I get your message. I have included in this newsletter, information on several topics that have been requested. The common problems are always, weed control and how to eliminate garden pests! Every year these are issues gardeners need to deal with.



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Natural Pesticides

Most yard and garden pesticides available today are synthesized chemicals. Because some of these pesticides have been associated with health and environmental hazards, interest in alternatives has been increasing in recent years.

Microbes are one natural source of pest control. Many bacteria, fungi and other organisms cause diseases that kill or cripple insect pests. These are called microbial pesticides.

Combinations of natural products have also proved effective pest controls. For example, combining vegetable oils with an alkaline substance, such as potassium hydroxide, produces soaps that can be used to control mites and insects. These products are known as insecticidal soaps. Vegetable oils or, more commonly, refined petroleum oils, yield horticultural oils that can be highly effective for pest management.

Plants themselves have proven to be sources of some of the most potent pest-control products. Many plants produce a host of chemical defenses that they use to naturally resist attack from various pests. Some plants are especially rich in chemicals that can be extracted and used for insect control. These products are known as botanical insecticides or, simply, botanicals.

Pesticides derived from natural sources, like those that are manufactured from petrochemicals, have a wide range of effects. Most botanical pesticides, for example, do less ecological damage than synthetics because they break down rapidly when exposed to heat, light and water. Others are as acutely toxic (or sometimes more toxic) than common synthetic garden pesticides. (Acute toxicity is a measure of the damage they can do to *you* if they're ingested, inhaled or absorbed through the skin.) All pesticides—synthetic and natural—are regulated as pesticides by the Environmental Protection Agency and the states, and by law must be used strictly in accordance with all instructions on the product labels.

Microbial Pesticides

The microbe most commonly used for garden pest control is the bacterium *Bacillus thuringiensis,* better known as *Bt*. Different strains of *Bt*, which occurs naturally in soils around the world, produce toxins that affect different insects. For example, the "kurstaki" strain of *Bt (Btk)* kills caterpillars, such as gypsy moth, hornworms and cabbageworms. Leaf beetles, such as the Colorado potato beetle, are susceptible to the "tenebrionis" strain *(Btt)*.

To be effective, *Bt* must be eaten by the pest. Susceptible insects stop eating soon after ingesting *Bt*, as it destroys the lining of their gut. Death often follows in a few days.

The primary advantage of *Bt* is its highly selective action. Most *Bt* products only kill caterpillars that eat it. This means that most beneficial insects are spared the adverse effects. *Bt* is considered quite safe to humans, and most products can be used right up to harvest.

Bt does have some limitations, however. Because it must be eaten, thorough coverage of the affected plant is critical. *Bt* also breaks down rapidly upon exposure to sunlight and water, rarely lasting more than a few days. What's more, *Bt* kills not only the larvae of pests, but also the larvae of butterflies. Know the insect you are spraying for and keep away from plants where butterfly larvae feed.

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Another bacterium long used for insect control is *Bacillus popilliae,* which produces the "milky spore" disease of Japanese beetle grubs, a major lawn pest. This bacterium has become distributed widely throughout eastern North America, originally through government programs and subsequently by the insects themselves. Milky spore is sold through many garden catalogs.

Microbes may sometimes be used for indirect control of plant pests. Perhaps the best example is the product Clandosan, sold for control of nematodes. This product consists primarily of crab shells and related material that is mixed with the soil. It stimulates the growth of microbes that feed on chitin, the main component of crustacean shells. Nematodes also are covered with chitin and so are susceptible to the microbes as well. Microbial pesticides are applied as sprays, dusts or granules, just as conventional pesticides are.

Horticultural Oil

Refined petroleum oils have long been used for managing insects and mites. Oils smother insects by plugging the orifices, called spiracles, through which they breathe. They may also be toxic to some insects and mites. Oil products developed for use in pest management are typically referred to as either horticultural oils or dormant oils. They are usually used as sprays, mixed with water in a 1 to 3 percent solution.

The primary problem with oils is that they can damage your plants if used improperly. The first oils to be used horticulturally were the "dormant oils," which could only be used safely on plants in a dormant state. However, our understanding of what makes oils useful as pesticides and what causes plant injury (phytotoxicity) has increased, and oil products that can be used safely on many plants, even when they've leafed out, are now available. Some plants, such as walnut, certain maples and cedar, do remain "oil shy" even to the most refined horticultural oils. Read the label for details on sensitive plants and on when *not* to spray (spraying under certain environmental conditions can cause injury).

Oils have remained a popular pest-management option because they are quite effective for many difficult problems. They're most commonly used as dormant sprays to control insects and mites that spend the winter on trees and shrubs. However, the refined oils now on the market are also useful for controlling whiteflies, young scales, mites and many other plant pests present during the growing season. Oils have also proven useful in managing some plant diseases. Horticultural oils are considered quite safe to humans and other wildlife. Adverse effects on beneficial organisms are also minimal, particularly those of dormant season sprays, which are applied when most beneficial insects are not yet present in the garden. Like soaps, horticultural oils act strictly through contact action and have no residual effects, so thorough coverage is essential.

Insecticidal Sopas

Soaps have been used as insecticides for over 200 years, but recently their use has increased exponentially. This is largely because there is now a better understanding of which types of soaps make the most effective insecticides, yet do not damage plants.

Insecticidal soaps are applied as dilute sprays (1 to 3 percent concentration) and work primarily by damaging the cell membranes of insects and mites. A wide range of insects are sensitive to soaps—primarily small, soft-bodied species such as aphids, leafhoppers and spider mites. But some larger insects, such as Japanese beetles, are also susceptible. Effects are rapid, usually resulting in death of susceptible insects within a few

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minutes after exposure. Soaps are sometimes sold in mixtures with other insecticides, such as pyrethrins, to increase their effectiveness.

The selective action of soaps and their high degree of safety to humans are their major advantages. Generally, they have a minimal impact on beneficial species. (One significant exception is that soaps kill predator mites, often an important control of spider mites.) Most insecticidal soaps are registered for use on a wide range of vegetable and ornamental plants.

One of the main limitations of soaps is that they work strictly on contact and have no residual effects. This means that they must be applied directly on the target pests, and so good spray coverage is essential. Also, soaps are more sensitive to certain environmental conditions than other insecticides are. For example, the minerals in hard water react with soaps to reduce their activity. And soaps may be less effective if applied during periods when they dry very rapidly.

Although the insecticidal soaps have been developed with plant safety as a major consideration, some plants are sensitive to soaps and can be injured. Most of these are listed on the product labels under the section outlining hazards associated with use. Indeed, research has also identified soaps that are particularly injurious to plants, and these herbicidal soaps are now marketed as contact "weed killers."

Many household soaps and liquid dishwashing detergents can be used effectively as insecticides. These should be applied as dilute sprays. Their main disadvantage is that their effects on plants and insects have not been tested and there is a greater chance that they'll cause accidental injury to your plants.

Alcohol

Alcohol affects many types of insects, apparently by causing them to dry out and die. Although there are no commercial alcohol insecticides, alcohol is an ingredient in some insecticidal soaps and "ready-to-use" insecticides.

Alcohol is often used to control mealybugs on houseplants. Usually, it is applied directly onto the insects with a cotton swab in order to avoid injuring the plant. However, many plants tolerate alcohol well, and insects can be controlled with a spray of alcohol and water in equal parts. Try spraying the alcohol solution on a small part of the infested plant first to make sure it does no damage. If after a few days the plant shows no adverse effects, go ahead and spray the entire plant.

Botanical Insecticides

Pyrethrum

The most widely used of the botanical insecticides are extracts from the flowers of the pyrethrum daisy, *Chrysanthemum cinerariifolium.* Powdered pyrethrum flowers are rarely sold for pest control, but there are numerous products containing the extracted active ingredients, pyrethrins. Formulations sold for garden use often combine pyrethrins with other ingredients such as soap, diatomaceous earth or rotenone, another botanical insecticide.

Pyrethrins have some unusual insecticidal properties.

Perhaps most striking is the rapid "knockdown" effect they have, which causes most flying insects to drop almost immediately upon exposure. Pyrethrins are also

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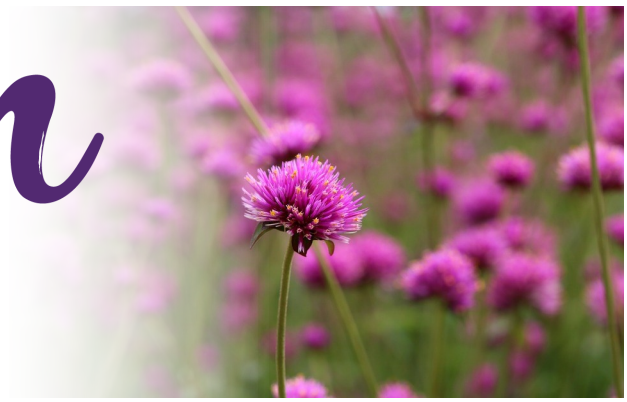

highly irritating to insects and can therefore be used as a "flushing agent" to disperse pests. They also rapidly degrade when exposed to light or moisture and so do not persist for long in the environment.

Most insects are highly susceptible to pyrethrins, so quite low concentrations are applied. At the same time, pyrethrins are quite non-toxic to most mammals, making them among the safest insecticides in use. The short persistence and low toxicity of pyrethrum-derived insecticides have enabled federal regulators to permit their use on a wide variety of crops, typically with little or no interval required between application and harvest. Pyrethrins also are among the few insecticides that are cleared for use around food handling and preparation areas.

In the past few decades, synthetic pyrethrins, or pyrethroids, have been developed. The pyrethroids have the basic chemistry of pyrethrins but are synthetically modified to improve persistence, insecticidal activity and other features. Few pyrethroids are available for yard and garden use, although they are used widely in commercial agriculture.

Rotenone

Rotenone is one of the oldest botanical insecticides. Records suggest that it was first used against insects in 1848. (For centuries before that it was used as a fish poison.) Most rotenone is derived from South American species of the genus *Lonchocarpus.* Rotenone is used most commonly as a dust prepared by grinding the plant roots or extracting the active ingredients and coating dust particles. Several rotenone/pyrethrins mixtures are marketed.

The Environmental Protection Agency has permitted use of rotenone on a wide variety of vegetables and small fruits. It is both a contact and stomach poison to insects.

Rotenone is used primarily for control of various leaf-feeding caterpillars and beetles, such as cabbageworms and Colorado potato beetle. Some insects with sucking mouthparts, such as aphids and thrips, are also susceptible to rotenone. It is a relatively slow-acting insecticide, often requiring several days to actually kill susceptible insects, although they stop feeding shortly after exposure. Gardeners should be aware of the fact that rotenone is the most acutely toxic of the widely available botanicals—more toxic than most common synthetic pesticides. It is moderately toxic to most mammals, and highly toxic to fish and aquatic life.

Ryania is the powdered extract from the roots and stems of the shrub *Ryania speciosa,* native to South America. It is sold primarily as a wettable powder. Ryania is also available in some combination formulations with pyrethrins and rotenone.

Ryania has shown promising insecticidal action against many insects. It is sold primarily for control of codling moth. Many caterpillars, leaf beetles and thrips also are susceptible to ryania extracts. Ryania affects these insects either on contact or when eaten. However, it has minimal effects on many beneficial insects, so it can be used with these and other biological controls. Ryania breaks down more slowly after application than other botanical insecticides. It is considered relatively non-toxic to mammals.

Sabadilla is an insecticide produced by grinding the seeds of the sabadilla plant, *Schoenocaulon officinale.* For several years sabadilla products were not available in the U.S. However, they are now sold by several mail-order suppliers, and garden centers have begun to carry sabadilla products as well.

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Sabadilla is both a contact and stomach poison and has shown greatest promise against several of the "true bugs," such as squash bug, chinch bug, harlequin bug and stink bugs. It has proven effectiveness against leaf-feeding caterpillars, Mexican bean beetles and thrips. Use of sabadilla on certain vegetables, including squash, cucumbers, melons, beans, turnips, mustard, collards, cabbage, peanuts and potatoes, is permitted by the EPA.. The ground seeds of sabadilla sold for garden use are considered among the least toxic of the various botanicals. However, sabadilla dusts can be highly irritating to the respiratory tract, often provoking a violent sneezing reaction if inhaled. Be sure to wear a dust mask when applying it and, as with all pesticides, follow precautions listed on the product labels. In addition, several of the alkaloids in sabadilla can cause rapid depression of blood pressure in mammals.

Neem

The newest of the botanical insecticides are those derived from seeds of the neem tree, *Azadirachta indica.* Extracts from neem seeds and other parts of the tree have long been used for pharmaceutical purposes, for example in toothpaste, particularly in India. Recently, neem has received a great deal of attention because it is so safe to humans and has unusual properties against insects.

Sprays of neem applied to leaves often deter feeding. Furthermore, neem apparently affects the hormones many insects need to develop, killing them as they attempt to molt or emerge from eggs. Many leaf-chewing beetles and caterpillars can be controlled with neem insecticides. Aphids and most other sucking insects generally are less susceptible.

Because of its demonstrated safety, neem was recently exempted by the EPA from food-crop restrictions, enabling manufacturers to market it for use on any edible or ornamental plant.

Source: https://www.bbg.org/gardening/article/natural_pesticides.

Easy Cheesy Enchiladas

Ingredients:

- 2 cans (15 ounces each) pinto beans, drained and rinsed
- 1 cup salsa
- 1 ½ cups corn (fresh or frozen, or a 15-ounce can drained and rinsed)
- ½ cup chopped mild green chiles (4-ounce can)
- ½ teaspoon garlic powder or 2 gloves garlic, finely chopped
- 1 ½ cups shredded cheese
- 8 whole wheat flour tortillas (10 inches) or 12 corm tortilla (6-inches)
- 1 can (15 ounces) enchilada sauce

Directions:

1. Preheat oven to 350 degrees. Lightly oil or spray a 9 X 13 in baking dish.
2. Mix beans, salsa, corn, chiles, garlic, and half of the cheese together in a bowl.
3. Warm each tortilla in a dry skillet and stack them on a plate.
4. Spoon about 1/2 cup of the bean mixture onto each tortilla.
5. Roll the tortilla and place seam-side down in the baking dish.
6. Pour enchilada sauce over the tortillas and sprinkle with remaining cheese.
7. Bake for 15 to 20 minutes or until hot.
8. Refrigerate leftovers within 2 hours.

Prep time: 10 minutes
Cooking time: 20 minutes
Makes: 8 enchiladas

Source: Oregon State University, *https://foodhero.org/recipes/easy-cheesy-enchiladas*

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Making and Using Compost In the Garden

Making your own compost is an easy and practical way to make use of yard waste and table scraps. Home composting can reduce the use of water and fertilizers, while improving the health of your soil and plants.

Compost is an organic soil that contains nutrients essential for plant growth. The nutrients are a result of the decomposition of biodegradable materials such as food scraps, paper materials, and yard waste that have been mixed together.

TABLE 1. Materials for composting

Brown materials (2 parts)	Green materials (1 part)	DO NOT COMPOST
• Dry leaves • Twigs less than ¼" in diameter • Shredded newspaper • Straw • Shredded household cardboard: egg cartons, paper towel and toilet paper rolls • Sawdust (if enough extra green material is added)	• Green leaves • Grass clippings[a] • Weeds (before they have gone to seed) • Leftover plants at the end of the season • Coffee grounds • Fruit and vegetable scraps • Eggshells • Manure (cow, horse, or poultry)	• Meat • Bones • Grease • Whole eggs • Dairy products • Diseased or insect-infested plants • Pet waste • Persistent perennial weeds such as yellow nutsedge, Canada thistle, quackgrass • Wood ash[b] • Black walnut leaves[c]

[a] **Caution:** Do not compost with yard waste treated with pesticides insecticides, herbicides, or fungicides.

[b] Adding wood ash is risky as it's easy to overdo (see A3635 in Resources).

[c] Black walnut leaves contain juglone, a compound that can be harmful to other plants.

How to make compost

Choose a site that is convenient and receives about 5 to 8 hours of sun. The easier the compost pile is to get to, the more likely it will become a habit to add more materials to it. Decide if you will keep your compost in a pile, a bin made out of wood or chicken wire, or a manufactured compost unit.

Begin composting by adding materials such as leaves, garden debris, eggshells, chopped or shredded branches, grass clippings, vegetable and fruit scraps, and coffee grounds. Microorganisms in your compost will feed on these organic materials for energy. Having a proper ratio of ingredients will increase the rate of metabolism. The best diet for metabolism is two parts brown materials to one part green. A compost pile needs to be at least 3 X 3 X 3 feet in size to heat up properly. To jumpstart the process, add a shovel full of garden soil or compost.

TABLE 2. Common compost problems

Problem	Solution
Your compost pile smells bad.	Too much water or too many nitrogen-rich green materials may cause the pile to have a bad odor. Add more brown materials and turn the pile.
Your compost pile isn't heating up; in fact, nothing seems to be happening.	Too much brown material or not enough water may have slowed your pile's rate of decomposition. Turn in more green materials and add water, if needed.

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A compost thermometer will help you track temperatures within the pile as the microorganisms break down organic materials. The pile's temperature continues to increase as the microorganisms metabolize the added materials. Temperatures can reach 135 to 160° F in a short time. Mature compost has reached an internal temperature of 105°F or higher for five consecutive days. The temperature should exceed 130°F fro four hours to eliminate weed seeds, insect eggs, and diseases.

Once the pile has reached maximum temperature, the pile will need to be turned. Mixing or turning the pile every week or so introduces new food sources and increases air circulation to the microorganisms.

Add water as you turn your pile during periods of little rain and when you add new materials. Your pile should feel as damp as a wrung-out sponge. You might see soil animals like earthworms, sow bugs, ground beetles, and springtails. These all play a role in decomposition.

Once all the organic materials are broken down, the curing stage begins. The microorganism activity begins to decrease causing the pile to cool. If you maintain your pile properly, the finished compost should be ready to be used in four or five months. The materials added at this point will be unrecognizable. The compost will be fairly moist with a rich dark brown color and an earthy smell.

If you are not interested in turning your compost pile or taking its temperature, don't worry. The materials you add will eventually decompose. It will just take about a year or more.

Using Compost in the Landscape

Compost slowly works into the soil and improves its overall health. Nutrients are slowly released to the plants. Compost also moderates soil temperature, improves soil drainage, fertility and structure, and suppresses weeds.

With ornamental plants, use compost just as you would bark or other mulch. Apply 2 to 3 inches of compost between plants, shrubs, and trees, keeping it about 1 to 2 inches away from tree trunks, shrubs, and plant stems.

No matter how you compost, remember the important thing is that your efforts are benefitting your soil and plants. You are also keeping reusable yard waste and food scraps out of the landfill.

Tree Planting Note: Do not add compost when planting a tree. It can cause root restriction. Always backfill the hole with the original soil you removed from it.

Composting Tip

Keep a small bucket in the kitchen to collect scraps. Top it off with a small amount of water before taking it out to your compost pile. You will not only be rinsing your container, but your compost pile will also gain some moisture.

Source: Christine Wen, UW-Extension Walworth County Horticulture Educator & Joe Van Rossum, Recycling Specialist Director at the Solid & Hazardous Waste Education Center (SHWEC), UW-Extension

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Zesty Asian Chicken Salad

Ingredients:

- 3 boneless, skinless chicken breasts cooked and chilled
- 3 green onions sliced
- 1 ½ cups small broccoli florets
- 2 medium carrots
- 1 red bell pepper cut into strips
- 2 cups cabbage shredded
- ½ cup fat free Asian or sesame salad dressing
- ¼ cup 100% orange juice
- ¼ cup fresh cilantro chopped

Directions:

1. Cut chicken into small strips and place in a medium bowl with onions, broccoli, carrots, bell peppers, and cabbage
2. In a small bowl, stir together dressing and juice. Pour over salad and toss well to coat. Stir in cilantro. Serve at room temperature.

Nutrition Info:

Serving size: 1 cup	Total calories: 184
Total fat: 5 g	Saturated fat: 1 g
Carbohydrates: 13 g	Protein: 22 g
Fiber: 4 g	Sodium: 456 mg

Source: https://eatfresh.org/recipe/salads/zesty-asian-chicken-salad#.Xyww1ihKjct

Sampling Lawn and Garden Soils For Analysis

Why analyze soil?

Soil should be analyzed to determine nutrient levels, fertilizer recommendations, and elevated lead levels in soil.

A soil nutrient analysis gives precise scientific information on your soil's ability to supply nutrients to your plants. You can save money and limit potential water pollution by applying only the nutrients your plants can use.

What will you get with a soil test?

- Soil nutrient content
- Recommendation of fertilizer to add

When to sample?

You can sample the soil anytime as long as it is not frozen. It is recommended to sample in early spring or late fall, so you have the test results in time to amend your soil. It normally takes the lab about 2 weeks to complete a soil analysis. It is important to avoid analysis after applying fertilizer.

Where and how to sample:

The samples you collect need to be from areas that have been managed similarly in the past. Gardens and lawns need to be sampled separately. If you have lawn areas where the grass grows differently , then it would be worthwhile to test these areas separately.

By: Geoff Siemering,Outreach Specialist; John B. Peters, former director, UW Soil and Forage Analysis Lab; and Doug Soldat, Assoc. Prof., UW-Extension Turfgrass and Urban Soil Specialist

Soil kits can be picked up at the Extension Office located at 400 University Drive, Room AE-227, Fond du Lac.

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4-H Program Coordinator - *Tracy Keifenheim*
Fond du Lac/Washington County Positive Youth Development Educator - *Ron Jakubisin*
Community Garden Coordinator - *Patty Percy*
Community Resource Development Educator - *Diana Hammer*
Fond du Lac/Dodge County Area Crops & Soils Agent - *Joe Zimbric*
Dairy & Livestock Agent - *Tina Kohlman*
Area Extension Director - *Cindy Sarkady*
Human Development & Relationship Educator - *vacant*
FoodWIse Nutrition Educator - *Pamela Nelson*
FoodWise Nutrition Educator - *Melanie Phillips*
FoodWIse Coordinator/Health & Well-Being Educator - *Amanda Miller*
Program Assistants - Pam Bartoli, *Tina Engelhardt, Katie Gindt, and Cassi Worster*

Requests for reasonable accommodations for disabilities or limitations should be made prior to the date of the program or activity for which it is needed. Please do so as early as possible prior to the program or activity so that proper arrangements can be made. Requests are kept confidential.

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227 ADMINISTRATION/EXTENSION BUILDING
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Time-Sensitive
Material