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Building Garden Soils in the Community Garden

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A garden soil that has been built over the years is worth its weight in gold. A rich, friable garden soil with good tilth and structure supports healthy plant growth. Healthy plants produce bountiful harvests over a long period of time. Fall is the season to work on building your garden soil.

Improving the garden soil takes an investment of time, effort, and organic matter. Good garden soil is rich in soil microbes and earth worms. It will have a fresh, sweet smell when turned. A good garden soil will clump when squeezed in the palm of the hand, but will drain well and have plenty of pore space for gas exchange.

How do you know what your garden soil needs? If you have not had a soil test for several years, take a sample for testing at the North Carolina Soil Lab. Sample boxes may be picked up at the Extension office. Follow the directions for soil sampling, and either return the filled sample box to the Extension office or mail it off yourself to the address on the box. In the fall, soil test results will be available from the lab within 3 weeks. The results will let you know what nutrients are needed in the soil to grow your garden. If lime is recommended, add it in the fall. It takes about 3-4 months for lime to become active in the soil. Lime affects the pH of the soil. Soil pH is a measure of the acidity or alkalinity and is the determining factor on whether nutrients in a soil can be taken up by the plant roots. Most garden crops grow best at a pH of 6.5.

Knowing the texture of your soil is also useful as you work to make the garden more productive. Soil texture is determined by the particle make up of the soil. A soil that is full of clay will feel sticky when wet, hold

water for long periods, and be extremely hard when dry. A soil that is full of sand will feel gritty, and will dry out quickly. An ideal garden soil is a loamy soil, with equal parts of clay, sand, and silt. Plant roots need water, nutrients, and oxygen. Pore space between the soil particles allows for the movement of water, nutrients, and oxygen.

Adding organic matter additions to a soil will increase its ability to hold nutrients in an available state for plants. Organic matter additions will also increase soil biological activity, which will affect the availability of nutrients. The long term goal of adding organic matter additions to soil is to increase the level of humus in the soil.

There are several ways to add organic matter to soils. Practices that gardeners may use are 1-growing cover crops, 2-adding animal manures, 3-adding compost, 4-using organic mulches during the growing season and 5-turning under fallen autumn leaves. Choose one or more of these practices to build a better garden soil.

Cover crops are planted to improve soil or for weed control. When a cover crop is grown, plant biomass that is turned under the soil adds organic matter which aids in the formation of soil aggregates. Soil aggregates will stabilize soil and reduce runoff and erosion. Another benefit of cover cropping is improved soil porosity so that roots can move through the soil with ease. Soil tilth is improved and crusting of soils is decreased while the rate of water infiltration is increased. Soil life is increased (microbes, micro- and macro-arthropods and earthworms) which contribute to efficient nutrient cycling and improvements in soil

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structure. Examples of winter legume cover crops include crimson clover, hairy vetch, Austrian winter pea (*Pisum sativum arvense*), and subterranean clover (*Trifolium subterraneum*). Cereal rye, wheat, and oats are also commonly used as small grain cover crops and in mixtures with the legumes mentioned above. Generally, winter cover crops are planted in early fall and allowed to grow until mid-spring, at which time the crop is incorporated by tillage, or killed and left as a surface mulch into which another crop is planted.

A cover crop demonstration will be planted in the Master Gardener Demonstration Vegetable Garden in October. Plan to visit the Cooperative Extension office and view cover crops growing in the Demo garden. Watch for results in a future issue of GardenWise.

The second method of adding organic matter to help build the garden soil is to add animal manures. The addition of animal manures to gardens has been practiced for thousands of years. It is imperative that manures be composted first, so that pathogens are killed in the 'heating' process which occurs in a properly maintained compost pile. Compost piles with animal manures included should heat to a temperature around 150F. This will safely kill off pathogens and most weed seeds. Never use dog or cat manures in a compost pile or in the vegetable garden. Rabbit droppings, chicken manure, horse or cow manures are suitable for composting. An alternative to using fresh animal manure is to add commercially available bagged, sterile cow manure. The bagged products have been sterilized and are pathogen free. Animal manures are a great way to add humus to the garden.

Every community garden should have a compost bin for excess plant debris disposal. Composting plants, peelings, sawdust, yard debris and leaves provides a way to divert organic wastes from the landfill and make a free organic soil amendment. Shred the organic materials into small pieces to speed up the compost process. Make sure that your compost pile has even moisture and aeration. Regular turning of the compost will provide the necessary oxygen for biodegradation of the organic matter. Add water when the compost pile is dry. Finished compost has a sweet smell, is dark in color, and looks like 'dirt'. In other words, if you can distinguish a leaf or twig in the compost, it is not finished.

Mulching the garden with organic materials during the growing season serves the multi-purpose of suppressing weed growth, holding soil moisture, and as it degrades, adding organic matter to the soil. Wheat straw and shredded bark are two common materials used as mulch. Some mulch may tie up soil Nitrogen and cause yellowing or stunting of plant growth in the garden. Adding a Nitrogen source at planting will provide the necessary supplementation to avoid plant growth problems.

Since we live in the deciduous forest biome, we have a great



Compost Bin

free resource for improving garden soils. Instead of raking and bagging the falling autumn leaves, spread them over the top of your garden and turn them under. The leaves will break down in time for spring planting, creating a healthy environment for soil microbes and earthworms. Adding fall leaves to garden soils is a good way to improve soil structure and add nutrients.

Don't expect to change your soil type or nutrient levels overnight. It takes the investment of time, organic materials, and the elements of weather to create a rich, friable garden soil. Community gardens should consider setting up a long term lease of the garden site, if the property is not owned by the gardeners. Having a long term lease agreement is the best way to protect your investment in the community garden soil. Healthy soils are the first and most important step in successful gardening.

Saving Those Flower Seeds for Replanting Next Year

A single flower can generate dozens or hundreds of seeds. Saving seeds can be economical and the procedure is quite simple really. Here are a few tips that will improve your success in seed saving.

Materials you will need:

Plant markers	Envelopes
Labels	Paper bags
Rubber bands	

- **Observe the seeds forming on the flowers:** Most flowers have their seeds in pods or capsules. Each flower has a different ideal time for gathering seeds. Generally you want to let the seeds dry on the flower as long as possible without the seeds disbursting. Watch the flower frequently as the seeds develop and ripen.

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- **Choose the best plants:** There is always a lot of variety in heirloom flowers. Some plants will have stronger stems, a more pleasing color or smell. Sometimes the plants will fade before it is time to harvest the seed and you may forget about the plant name or which one looked the best. Use the plant markers during the growing season to help you to remember which seeds you want to save. Keep in mind that a cultivar will not come back true if you save seed from them.
- **Use your paper bags to collect the seed:** Shake the seed head over the paper bag to collect the seeds or just snip off the entire dried pod or seed head into the bag. Remember to label the bag too.
- **Separate the seeds from the chaff:** Some seeds fall easily from the pod or seed head. Others need to be rubbed to loosen them. Remove the non-seed material or chaff before final storage.
- **Store the seeds properly:** Some good choices for storage are small glass jars like baby food jars or maybe even pill bottles. Keep the seeds in a cool place. The refrigerator is good if you have room. You can store several types of seeds in separate envelopes in the same jar.



Other tips would include decorating the envelopes and giving seeds as gifts. It is also good to include details about the plants that will grow from the seeds - for example, bright yellow color on bloom. You can also include things such as planting depth, sun or shade, and other preferences on the envelopes to remind yourself or others when you share your seeds.

From the Master Gardener Hotline - Leaf Mulch

Bertram Lantz, Master Gardener Volunteer

Many municipalities offer leaf mulch free of charge. The City of Winston-Salem picks up leaves in the fall and takes them to an area behind the Anderson Recreational Center on Reynolda Park Rd where they decompose organically during the winter months. The City uses the leaf mulch at several public facilities, but they also make it available to the public on select Saturdays in April & May and again in September & October for personal use. Anyone interested in taking advantage of this FREE program can call the Winston-Salem City Links at 336-727-8000 for more details.

Leaf mulch can be very beneficial, and once broken down it improves the organic content of soil, helps the soil hold moisture, and provides a great environment for worms, soil microbes and other beneficial bacteria. However, there have been a number of questions about the problems that can develop when using leaf mulch from a municipal facility.

We recently had a call that involved the use of such mulch in a landscape garden. It seems that shortly after the mulch had been applied, the leaves on azalea bushes started to turn yellow. Leaf mulch itself is basically a soil conditioner and is not a fertilizer. In fact, leaf mulch can cause a nitrogen deficiency (availability), which can cause leaves on a plant to turn yellow. Since there were no signs of insects, we recommended that a general purpose fertilizer such as 10-10-10 be applied to the entire bed. A few weeks later the caller notified us that after applying the fertilizer the leaves on the azaleas started to turn back to green.

A second call involved a problem in a vegetable garden. After applying the mulch, the leaves on tomato foliage appeared to have a fungus. When you obtain leaf mulch from a municipal facility, you can't be certain what you are getting. However, it is unlikely that any significant diseases are present, especially considering the volume of leaves that is collected, mixed and decomposed over the winter months. There are thousands of fungi that grow in almost every environment on earth. While it is possible that a fungus was transmitted in the mulch, it is also possible that the problem actually developed in some other way. We recommended that Copper Sulfate or another fungicide recommended for the particular crop be applied to the plants to prevent fungal diseases. If that didn't solve the problem there was a possibility that the crop would be lost, in which case the entire plant, including any fruit or dropped leaves should be removed and disposed of.

If you have the room on your property, leaves that drop in the fall can be collected and placed in a wire cage, approximately 3' x 3' with one end open. Sheep fencing can be used to make the cage, and it is best to shred the leaves in a shredder or cut them up with your lawn mower to speed up decomposition. Try keeping the shredded leaves moist, turn them occasionally, and after 6-8 months, the leaves should be ready to be used for mulch. Be sure you don't use leaves from a Black Walnut tree. These leaves contain Juglone that inhibits growth of many plants. If you don't have enough leaves there is a good chance that your neighbors will gladly offer theirs to your collection. By doing it yourself, you can control the leaves that are used to develop your mulch or compost.



Maintaining an Established Lawn

There are always lots of questions concerning lawn care in the Piedmont, everything from disease control to renovation. With a new lawn, you can consider the lawn established when you have mowed it three times. The tips in this article deal only with an established lawn.

- **Watering Properly** - Improper watering of the lawn results in wasting water and unhealthy plants. In the absence of rain, water should be applied only when the lawn shows signs of moisture stress. The signs of moisture stress include a dark bluish-gray color; footprints that remain after walking and wilted or curled grass blades.
- **Mowing** - You will choose to use either a rotary or reel mower. The reel mower is preferred if grasses are cut to less than 1 inch. Our common fescue lawns are not cut to this low height but usually maintained around 2.5-3 inches.
- **Fertilizing** - A soil test should be taken every 2-3 years to determine how much lime, phosphorus, and potassium is needed by your established lawn. Although a poor substitute, a complete fertilizer in the ratio of 4:1:2 can be used if you have not taken a soil test. One should determine the amount of fertilizer, ratio of nutrients and when to apply based on the type of grass you are growing in your landscape.
- **Coring (Aerification)** - Soils that are subject to heavy traffic are prone to compaction. Coring will alleviate this condition. Use a device that removes soil cores. Chop up the cores and distribute them by dragging with a span of chain-link fence or a mat. Do coring during the active growing season for the grass you are growing.
- **Renovating a Lawn** - The term lawn renovation refers to any procedure beyond normal maintenance required to upgrade an existing lawn. A deteriorated lawn is often a symptom of some underlying problem. Some of the major causes of turf deterioration are listed:

Poor establishment procedures

Improper lawn management

Poorly adapted grasses

Disease, insect, or weed infestation

Improper nutrient balance

Excess thatch buildup

Any problem that caused the lawn to deteriorate must be corrected before renovation begins.

The information provided in this article came from a North Carolina Extension Publication titled "Carolina Lawns" (AG-69) and can be obtained from the local Extension Office.



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