Garden Beds

Most garden beds are created as permanent additions to the home landscape. Proper site selection and soil preparation will improve plant survival and establishment. How much effort is needed to create a new garden bed depends onsite and soil conditions as well as the cultural requirements of the plants that will be placed there.

Site Selection

The first step in establishing a bed or border is deciding where it should be located. Will it be for private enjoyment or public view? Should it be a formal geometric shape or an informal design with flowing curves? Often this is dictated by topography and personal preference. Check out garden design books for ideas on bed placement and shape.

How much sun does the site receive? Ideal areas for vegetables, fruits and many flowering plants will receive 6 to 8 hours of sunlight each day. A good number of perennials, ground covers and shrubs can tolerate or even prefer partially shaded conditions. Few plants, however, perform well in heavy shade. It usually makes sense to select plants that have light requirements similar to those your site offers.

Another factor to consider is drainage. Does water puddle in this spot for long periods after a rainfall? This may indicate compacted soils, a hardpan layer, or a site with a high-water table. Since most plants require good drainage, these areas could be physically amended, avoided or in the case of soggy soils, planted with species adapted to moist conditions.

Is the site especially sandy or gravelly? When water drains too quickly plants may be susceptible to drought. Additions of organic matter will increase the amount of water the soil holds. Otherwise, seek out plant species that tolerate dry soils. Soil nutrient testing is an easy and efficient way to determine the pH and nutrient levels of a garden soil. Soil tests are inexpensive and recommendations are made for the amounts of limestone and fertilizer to apply if necessary. The pH of the soil is very important as it affects the availability of all plant nutrients. Adjusting the pH and nutrient levels before planting ensures a healthier more productive garden. For information on soil testing, contact the UConn Soil Nutrient Analysis Laboratory, UConn Home and Garden Education Center or call us at 877-4866271.

Methods to Establish a Garden Bed

The traditional way to establish a garden bed is to remove the existing vegetation, loosen the soil and mix in amendments such as organic matter, limestone and nutrients. This tried and true method has worked well for generations of gardeners. Sod and other vegetation can be dug up by hand, rototilled and raked, or sometimes eliminated with a sod cutter.

If an organic amendment containing low levels of nitrogen or phosphorus is used, like peat moss or leaf compost, the soil can be tested before the organic matter addition. This way the organic material along with the recommended amounts of ground limestone and fertilizer can be incorporated at one time. When organic materials that contain high levels of nutrients such as manures, spent mushroom soils and some composts are used, it is better to mix no more than 1 inch of these into the soil first, then test the soil for pH levels and nutrients. Application of organic materials containing relatively high levels of nutrients can increase the phosphorus content of the soil to levels that can be environmentally harmful. Often limestone or other sources of nutrients may not be necessary. When preparing garden beds in the fall it does not make sense to add a source of nitrogen unless beds will be planted shortly after preparation. Nitrogen added in the fall will likely be leached from the soil during the winter and early spring. Nutrients like phosphorus and potassium can be added if a soil test indicates that they are at insufficient levels. Slow-release, organic sources of phosphorus include rock phosphate and bone meal. Greensand is slow release mined mineral containing potassium.

Beds in Heavy Soils or Compacted Sites

In areas where the soil is very compacted, fine-textured and heavy, or where an underlying hardpan layer exists, double digging can be performed. Double digging loosens the soil to two spade depths. It is hard work but yields impressive results. To double dig a bed, start at one end and dig a one-foot wide trench to the depth of your spade or shovel. Place the topsoil in a wheelbarrow. Next, using a garden fork, loosen the subsoil to the depth of the tines. Limestone can be worked into the subsoil when loosening it if the pH is low. Repeat this procedure with the next one-foot strip placing the topsoil into the first trench. Continue until the end of the bed is reached using the soil stored in the wheelbarrow to fill the last trench.

To finish the double dug bed, top with 2 to 3 inches of organic matter and work it into the top six inches or so of soil. A mixture of organic materials is best. For example, one inch of a high nutrient manure and two inches of low nutrient leaf compost or peat moss. The goal is to incorporate adequate amounts of organic matter but not to boost the nutrients to excessive levels. The incorporation of organic matter is a key step. Organic matter will improve the soil structure creating a more porous rooting medium that will drain well and be permeable to air yet hold moisture and nutrients. Organic matter also provides food and energy to beneficial soil inhabitants like earthworms, moderates soil temperatures and releases nutrients as it decays. An ideal organic matter level for many cultivated plants is between 4 and 8 percent. Some native plants and those adapted to especially well draining soils may prefer lower organic matter levels. A soil test can evaluate organic matter levels. Ground limestone, phosphorus and potassium if necessary, can be mixed into the soil along with the organic matter.

Raised Beds

Another method to create a planting bed is to mound or layer soil and organic materials on top of an existing site. The bed is raised above ground level, which from a design point, may or may not be desirable. It can be contained with boards, stones, or the like for a more formal look, or you can simply make gradually sloping edges around a mounded bed. Raised beds are often used for aesthetic purposes. They are also a good way to deal with compacted areas or soggy sites.

Start by cutting grass or other vegetation down to one-inch or less. Remove any persistent, deep-rooted perennial weeds like dock, dandelions or thistle. Put down a 6 to 8-inch base of coarse builders' sand or very sandy soil if the soil on the site is dense, compacted or poorly drained. On well-drained sites spread a thick layer of moistened newspapers or a single layer of moistened cardboard. Overlap the edges of either material to ensure good coverage. Cover the sand or paper with a 6 to 8-inch layer of topsoil, then top with 2 to 3 inches of a low nutrient organic matter or one inch of a high nutrient organic matter such as manure and another inch or two of a low nutrient

organic material such as peat moss. Mix the organic matter into the topsoil and submit a sample of this soil for pH and nutrient testing. Incorporate limestone and fertilizer at recommended rates and topdress with 2 to 3 inches of mulch. To plant, pull back the mulch, dig a hole and set plant in even with the soil surface. Keep mulch 1 to 2 inches away from plant crowns. Beds will settle and in about one year they will be only about one-half their original height.

Sheet Composting

Another technique for creating garden beds is sheet composting which is referred to by one author as lasagna gardening. For sheet composting, organic materials are spread in wide layers (sheets) over the ground. No turning or mixing is necessary. The earthworms and soil microorganisms will do the work for you. In general, it will take about 6 months for the composting to occur so sheet compost gardens started in fall will be ready to plant next spring and vice versa. Begin as with the layered bed by cutting down any existing vegetation to one-inch or less and removing persistent weeds. Cover the area with a thick layer of newspaper or single layer of cardboard. Wet paper or cardboard is easier to work with. Be sure to overlap the edges by a few inches to stifle weed growth. Put down an 8-inch layer of coarse organic material. You can use chopped leaves (shred with a lawn mower, shredder or machete), straw, wood shavings, spent garden plants (disease-free), sawdust, pine needles and whatever else you can get your hands on. A mixture of materials is best. Moisten them as they are spread.

Follow this with a 2-inch layer of organic materials high in nitrogen. A high nitrogen source of organic material is used in this situation because of the eight inches or so of high carbon material that is to be composted. A source of both carbon (i.e. dried leaves) and nitrogen (i.e. lawn clippings) is needed for timely decomposition to occur. Some high nitrogen sources of organic material include grass clippings, hay, kitchen wastes, seaweed or manure based compost. These high nitrogen organic materials can be used but keep in mind that they may also contain considerable quantities of phosphorus as well as nitrogen. Excess levels of phosphorus in soils can contaminate water sources. If a high nitrogen source of organic material is not available use one cup of bloodmeal, cottonseed meal or a urea fertilizer for each 20 square feet. Another layer of damp newspapers or cardboard can be put on top. Finally put down 2 to 3-inches of a low nitrogen mulch such as shredded bark.

Avoid walking on garden beds. Allow room for pathways so plants can be tended to without compacting the soil. If the
garden is too small for pathways, place some stepping stones in areas most likely to be walked on. Also, do not dig new beds when the soil is too wet. Wet soil will compact easily and plant roots will have difficulty becoming established. Often much work is involved in creating new garden beds. Soil preparation efforts taken at the beginning will be most noticeable as the gardening seasons wear on.

Contact your local Cooperative Extension Educator with questions concerning your soil test report and fertilizer recommendations, or for management suggestions.

Further inquiries may be directed to:
Soil Nutrient Analysis Laboratory
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Storrs, CT 06269-5102 (860)
486-4274

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