Techniques help establish gardens, orchards in clay soil

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If you are struggling to garden on tight, poorly drained clay soils or want to establish an orchard or garden on clay soils, don't despair. Many techniques can be used to make clay soils more people and plant friendly.

Typically, the first response by the novice gardener to improve clay soil is to incorporate abundant amounts of organic matter, sand and gypsum. While the addition of these materials can improve tilled land, amendments do little to address poor internal drainage. Raising the portion of soil containing plant roots (root zone) above the surrounding grade allows gravity to pull excess water from the root zone more effectively. As water moves out, air moves in to fill soil pore spaces. Maintaining a proper balance of soil, water and air is critical for a productive garden and orchard.

The most commonly used technique to elevate the root zone in orchards is to construct berms. To build berms for a home orchard, start by deeply discing or tilling to loosen the soil. Once the locations of the tree rows are determined, use a tractor blade to move soil from between the tree rows to the rows themselves to create pyramid-shaped berms 12 feet wide and 12 inches high. The top of the berms may be leveled off to slow runoff when the trees are watered. To slow erosion, the sides of the berms should be planted with a perennial cool-season grass, such as rye or fescue. Berms should always be installed up and down the slope to ensure water moves out of the row middles.

In situations where only a few trees will be planted or the site is level, berms can be constructed using purchased topsoil. With this approach, the grower can exercise control over the type of soil used to construct the berms. The primary disadvantage of this option is cost. In southern Oklahoma, topsoil is currently selling for around $20 per cubic yard for dump truck quantities. Check out any source of topsoil before purchasing as the definition of topsoil is not well defined.

Most vegetable gardeners who successfully grow on clay soil do so...
by constructing raised beds. Raised beds can be permanent or temporary. The majority of permanent raised beds are bordered by some type of barrier to maintain the shape of the bed. However, some are nothing more than mini-berms. Border beds are typically 2 to 4 feet in width and 6 to 12 inches in height. One trend is to construct beds waist high to enable gardening by senior citizens and those who are physically challenged. Border beds are typically filled with purchased topsoil and amended with peat or compost as needed.

Borderless or ‘mini-berm’ permanent raised beds are typically covered with weed barrier fabric to maintain bed shape, making them a good option for perennial crops such as asparagus and brambles. Some gardeners use borderless beds for vegetable production by seeding or transplanting through small openings in the fabric cover. Borderless beds are typically formed using existing soil amended with sand, gypsum and compost. However, some growers choose to use purchased topsoil.

Temporary beds are formed using a shovel, a tractor-powered hiller/lister or a tractor-powered bed shaper. Temporary beds are formed just prior to planting because they are susceptible to erosion. A common practice is to form beds for a spring crop followed by a second set of beds for a fall crop. Because of the frequency in which they are formed, temporary beds are more suited to coarse, well drained soils.

Home gardeners can be successful growing on clay soils if they are willing to invest the time and money into berm and/or raised bed construction. For more information on constructing and using raised beds, see the Noble Foundation publication *Permanent Raised Bed Gardening* at [www.noble.org/ag/horticulture/raised-bed-gardening](http://www.noble.org/ag/horticulture/raised-bed-gardening).