


Digging In

 Expect *some* hard work at the beginning, particularly if you are using hand tools. This is a great way to get parents and other volunteers involved, but this can be a fairly discouraging and tiring task for all but the oldest students, particularly if the plot is large. We strongly encourage you to check with your parent population and equipment rental companies for the free use of a rototiller. While we want to foster a connection to the soil, the practical reality is that many of us do not labor manually for a living and may not be up to this particular challenge. Get as many volunteers as possible, have plenty of water and shade, take some picnic breaks and maintain a slow, comfortable pace.

Traditional Soil Preparation Method


It is usually helpful to soak the garden area several days before digging to soften the soil. However, do not begin to till or dig before the soil has dried enough to crumble in your hands.



TIP

If you squeeze some soil in your hand and it forms a ball, it's too wet to work. Or, if soil sticks to your shovel, it is still too wet to work. NOTE: You can *permanently* damage the soil structure by working it when it is still too wet.

To break up and aerate compacted soil, begin by plowing or digging deeply, at least 12 to 18 inches. In very hard soils, you may even need a pick. Don't relocate the garden because you think

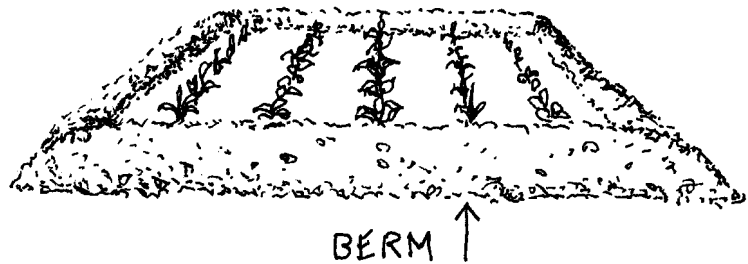


you hit caliche. Although caliche exists throughout the Southwest, there are many areas that just suffer from extremely hard-packed soil. Find someone knowledgeable to examine the area. A series of soakings and pickings, with some additional organic material, should eventually yield workable soil.

Work amendments into the top 10 inches of soil. You may choose to keep costs down by amending only the planting areas, not the pathways. Or it may simply be easier to cover the whole plot, particularly if you do not plan for stationary beds.

To open up heavy clay, increase the water retention of sandy soils, and to improve aeration for all soils, add generous amounts of organic matter, up to 1/3 by volume (refer to the list of organic material in Chapter 6). If you are using other fertilizers (especially phosphorus sources which need to be placed in the root zone), apply them at this time following the instructions on the container. Apply gypsum and/or soil sulfur if you have determined the need for these amendments.

Another thorough irrigation, with water penetrating at least two feet, will leach harmful salts from the future root zone in the soil. (Poke a rod or stick into the ground to measure moisture.) This is important particularly if you have used certain saltier manures (horse and chicken). Let the soil “simmer” for a few weeks before planting. This will allow for further amendment decomposition and drying out of the soil. A final turning and raking before planting day is a good idea, and is something the children can handle. If you are not using a drip irrigation system and have level beds, create a shallow basin using a berm or small dike of dirt around the edge to allow for flood irrigation and salt accumulation on this lip.



If you are laying block for raised beds, pouring footings for fencing or trenching pipe for a watering system, you may want to complete these construction items before the final preplanting soak. The time to first planting, the time of the year and the amount of heat you can tolerate will help you to decide!

Raised Beds

A raised bed is simply soil that is improved and built up, or raised, above ground level. The advantages of raised beds are improved drainage and little or no compaction from foot traffic. Over time, it is usually easier to improve soil structure and fertility in the confines of a raised bed. Raised beds make gardening possible for those who are physically challenged or who can not easily bend or kneel. Interesting geometric patterns can be created with raised beds as well as different levels or tiers.

Many gardeners prefer to place borders around raised beds to prevent erosion from wind, watering and working the soil. Research conducted by Texas Cooperative Extension found no evidence that toxins impregnated into railroad ties leached into the soil. However, there are many alternatives available for edging raised beds. Lumber, bricks, cement blocks and stones can be used as borders. Be sure to use lumber that has not been chemically treated so chemicals won't leach into your soil over time.



RAISED BED



If borders are not available, the soil can be raked and the beds “remade” before each planting. Borders can be added when they become available.

It is a good idea to loosen the soil and work it as described above to improve drainage and root penetration. Then build up a layer of soil approximately 8–12 inches deep, mixing soil from your garden with generous amounts of organic matter. Each planting season, continue to build your soil by adding organic matter and soil amendments.

The next section on Permaculture describes an alternative method of building raised beds over time.

Alternative Soil Preparation Method

The concept of permaculture was developed by Australian Bill Mollison over 20 years ago after observing native cultures and natural ecosystems. Permaculture is a contraction of “permanent agriculture” and “permanent culture.” Its guiding principle is to observe nature and then mimic it, thus lessening our impact on the earth.

Permaculture encompasses different techniques and materials for different climates. A complete discussion of all its principles is beyond the scope of this book, but we have included a permaculture method for building good soil without the preliminary heavy digging required with traditional soil preparation. To learn more about permaculture, check the listings in Appendix B and D.

Soil Preparation

Start with the original layer of soil, undisturbed. Sprinkle blood meal or cottonseed meal at the rates indicated on the container over the entire area. Spread about six inches of manure on top of the meal. Water this layer until just moist throughout. The meal and manure are organic nitrogen sources, which will generate heat to kill weed seeds and disease pathogens. It’s best to use manure that has aged for two or three months. If only fresh manure is available, continue with the layering process, but let it sit for two months or so before planting. Fresh, or “hot” manure can burn tender plant roots.

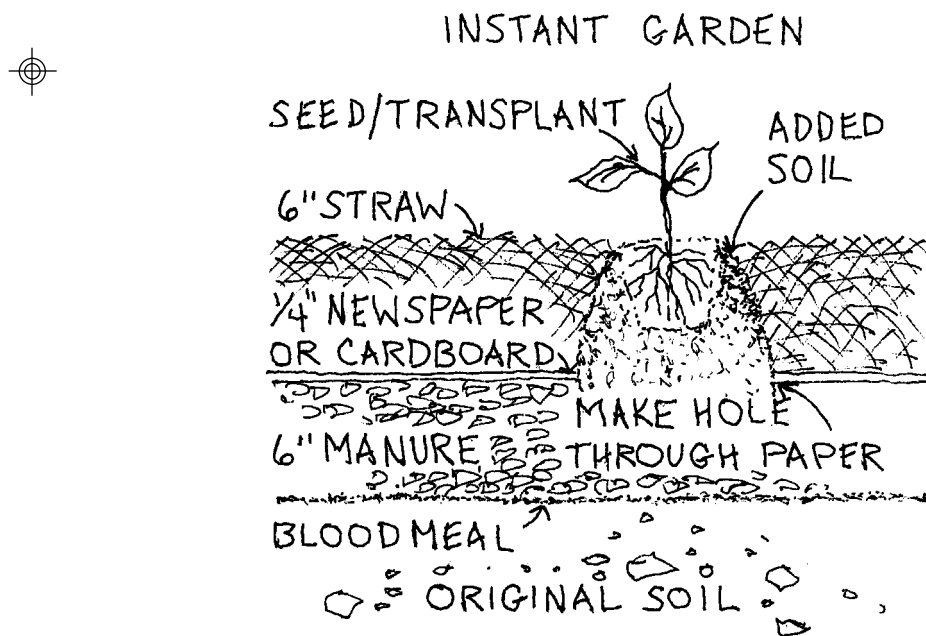


Next, layer one-quarter-inch of newspaper or cardboard on top of the manure. Use rocks or bricks to prevent them from blowing around as you spread them on the ground. Moisten this layer thoroughly.

Finally, layer six inches of straw on top. Water this layer until moist. If the manure is aged, you are ready to plant!

Planting

Push aside an opening (about the size of your fist) in the straw. Poke a hole through the layer of newspaper or cardboard so that plant roots will be able to expand. Fill the opening with soil from your garden. This soil will be loaded with microorganisms that will help decompose the organic layers. Plant seeds or transplants using the guides on seed packages or in Appendix F. Use the information in Chapter 11 to determine watering frequencies.



Permaculture soil building method. Adapted courtesy of Permaculture Drylands Institute.

This method mimics what happens on a forest floor—leaves and pine needles pile up, animals leave droppings, rain falls. If you scoop below that top layer of leaves, you will probably find a rich, dark crumbly soil. This is what you are trying to achieve in your garden. Over time, the straw and manure will decompose and build a layer of rich organic matter.

For the next planting season, you can repeat the layering process or plant directly into the decomposed layer. If you are planting during the hot summer months, you will need to plant deeper to prevent the column of dirt from drying out. You may need to dig below the newspaper layer into the decomposing manure to plant. Small seeds may have difficulty germinating if the straw drifts over and covers them.

The obvious advantage to this method is that you can begin planting immediately without any heavy digging. This is particularly helpful if you don't have access to rototillers or strong labor. Children can easily handle this method of building good soil and learn about nature's recycling process at the same time.

Maricopa County Master Gardeners tried this permaculture method in their Demonstration Garden and were pleased with the results. Remember: there are many correct ways to garden! Many lifelong gardeners enjoy the challenge of trying something different, whether it is a new seed variety, soil preparation method or "secret" fertilizer recipe. Enjoy experimenting with your students and finding what works best for you.



TIP

Invite the local media or school officials to a groundbreaking ceremony. Snap a few pictures to document the growth and development of your garden.

