

Introduction

The key to a successful garden bed is soil preparation. This document describes three techniques for preparing the soil for your new garden. The technique chosen depends upon the soil conditions, size of the area, materials available, and the energy level of the gardener.

Technique #1: Sheet Mulching

Sheet mulching will eliminate turfgrass, suppress weeds, and infuse the area with soil life. This is a good technique for large areas with soil that is already in fair to good condition. It will take 2-4 years for the structure of clay soils to be remediated.

Bare-bones sheet mulch recipe

1. Cut existing vegetation as close to the soil as possible.
2. Heavily water the area or wait for a heavy rain. It will be difficult for rainwater to reach the soil for a few months after sheet mulching.
3. Wait a day for water to soak into the soil. This will minimize soil compaction when walking on it.
4. Aerate and loosen the soil with a pitchfork or broadfork.
5. Lay down ¼ to ½ inch of newspaper or one layer of cardboard. Overlap seams by 6 inches. Dampen the materials to keep them from blowing around.
6. Add 2-8 inches of compost. More compost should be used for soils with poor tilth.
7. Top with 2-4 inches of wood chips or 8-12 inches of loose, weed-free straw. Incorporate dry leaves to add additional organic matter.
8. Planting into the top layer of compost is possible, but plants may not thrive the first year.

Robust sheet mulch recipe

1. Follow steps 1-4 above.
2. Add soil amendments depending upon soil needs; e.g., rock phosphate, bonemeal, blood meal, greensand, kelp meal.
3. Add nitrogen material or compost; e.g., manure, blood meal, cottonseed meal, fresh grass clippings, kitchen and produce scraps, slashed garden vegetation. This layer will attract worms to help aerate and fertilize the soil.
4. Open up and loosen the soil using a broadfork or pitchfork. This will provide oxygen to soil life and incorporate compost into the soil.
5. Lay down ¼ to ½ inch of newspaper or one layer of cardboard. Overlap seams by 6 inches. Dampen the materials to keep them from blowing around.
6. Add another layer of nitrogen material or compost to entice worms upward.
7. Add 1-8 inches of compost.
8. Add 8-12 inches of loose, weed-free straw. Incorporate dry leaves to add additional organic matter.
9. Add 2-4 inches of compost.
10. Top with 2 inches of straw.
11. Planting into the top layer of compost is possible, but plants may not thrive the first year.



Moistened newspaper is down. Adding a layer of compost on top of newspaper.



Eight inches of straw is down. Adding a layer of compost on top of straw.



Layer of straw sits on top of finished bed.

Overview of Techniques

#1: Sheet Mulching

Soil: Fair to good
Area size: Small to large
Implement: Summer or Fall

#2: Tilling In Compost

Soil: Poor
Area size: Small to medium
Implement: Anytime

#3: Double-Digging

Soil: Poor and compacted
Area size: Small
Implement: Anytime

Robust Sheet Mulch Layers

Straw (top)
2 inches

Compost
2-4 inches

Straw
8-12 inches

Compost
1-8 inches

Nitrogen Material or Compost
½ inch

Newspaper or Cardboard
¼ to ½ inch

Nitrogen Material or Compost
½ inch

Soil amendments

Grass / Vegetation

Soil surface (bottom)

Technique #2: Tilling In Compost

For very clay soils, loosening the and incorporating compost with light tilling immediately improves soil tilth and drainage. Tilling, however, brings weed seeds to the surface and breaks up soil structure, reducing its natural ability to hold water and nutrients (repeated tilling creates additional weeding and watering work). This technique is good for small to moderately sized gardens when immediate planting is desired.

1. Remove turfgrass using a shovel or sod cutter. (Turned upside down, the turfgrass can be used as a top-ping for a berm or mounds elsewhere in the landscape.)
2. If the soil is very dry, water the area or wait for a moderate rain.
3. Wait a day for water to soak into the soil.
4. Using a tiller, loosen soil to a depth of 8-12 inches. Till lightly—just enough to loosen the soil.
5. Add 8-12 inches of compost. More compost should be used for soils with poor tilth.
6. Work compost into the soil using a shovel or by lightly tilling.
7. Add soil amendments depending upon soil needs; e.g., rock phosphate, bonemeal, blood meal, green-sand, kelp meal.
8. Smooth the soil using a steel rake.
9. Add 2-8 inches of compost.
10. Top with 2-4 inches of wood chips or 4-12 inches of loose, weed-free straw. Use less mulch if immediate planting is desired.

Technique #3: Double-Digging

Double-digging quickly creates optimal conditions for plants to thrive by loosening compacted soil to a depth of 2 feet. But... it is a lot of work and is only needed for very poor and compacted soils in small areas.

1. Follow steps 1-3 of the "Tilling In Compost" technique.
2. Add 2 inches of compost.
3. Dig a trench to the depth and width of a flat spade. Place the dirt on a tarp or in a wheelbarrow.
4. Loosen the subsoil in the trench as deeply as possible using the spade, a pitchfork, or broadfork.
5. Dig a trench next to the first trench. Place the dirt into the first trench.
6. Loosen the subsoil in the trench and continue until the entire bed is complete.
7. Add 8-12 inches of compost.
8. Work compost into the soil using a tiller or shovel.
9. Add soil amendments depending upon soil needs; e.g., rock phosphate, bonemeal, blood meal, green-sand, kelp meal.
10. Smooth the soil using a steel rake.
11. Add 2-8 inches of compost.
12. Top with 2-4 inches of wood chips or 4-12 inches of loose, weed-free straw. Use less mulch if immediate planting is desired.

Compost and Mulch

Compost and wood chip mulch are available at the Iowa City and Cedar Rapids landfills.

Soil Tests

Nutrients

Test your soil's current nutrient levels before adding amendments.

Iowa State University
Soil Plant Analysis Lab
G-501 Agronomy
Iowa State University
Ames, IA 50011-1010
www.agron.iastate.edu/soiltesting

pH, phosphorus, potash: \$8

Contamination

If you suspect your soil is contaminated, it is a good idea to get it tested before establishing a new bed.

State Hygienic Lab
2490 Crosspark Road
Coralville, IA 52241
319-335-4500
www.shl.uiowa.edu

E. coli:	\$18
Oil and diesel fuel:	\$60
Heavy metal:	\$20
Pesticides:	\$180
Gas, cleaners, paint:	varies



Adapted from:

Edible Forest Gardens, Vol. II, by Dave Jacke

Gaia's Garden, by Toby Hemenway

How to Grow More Vegetables, by John Jeavons