

Deep Tillage

Georgia

Conservation Practice Job Sheet – 324 (9/08)

Land User _____

County _____

Date _____

Farm # _____

Tract # _____

Assisted By _____

Deep Tillage



Definition

Deep tillage is performing tillage operations below the normal tillage depth to modify the physical or chemical properties of a soil.

Deep tillage is sometimes called subsoiling or ripping and is performed from time to time below the normal tillage depth.

Purposes

Deep tillage is applied as part of a conservation management system to support one or more of the following:

- Fracture restrictive soil layers
- Bury or mix soil deposits from wind or water erosion or flood overwash
- Reduce concentration of soil contaminants, which inhibit plant growth

Conservation Management System

Rarely does one conservation practice provide the treatment needed for all of our natural resources.

Deep tillage is a component of a conservation management system, a combination of conservation practices and management that achieves a level of treatment for our soil, water, air, plant, and animal resources while also meeting the objectives of the land user.

In addition to deep tillage, practices such as residue management, cover crops, conservation crop rotation, pest management, nutrient management, and various structures are often needed.

General Specifications

Deep tillage is to be done in a planned sequence as outlined in the conservation plan or on this job sheet. Additional requirements may be found in the statement of work.

If using a cover crop of forage radish, rapeseed or turnip to “biodrill” or reduce soil compaction as a result of plant root growth, use the jobsheet for the Cover Crop Standard (Code 340).

Deep tillage should be done when the soil moisture content is favorable. For example, perform deep tillage when soil moisture is

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less than 30 percent of field capacity, according to the results of the “feel test” (<http://www.nm.nrcs.usda.gov/technical/tech-notes/agro/ag72.pdf>).

Deep tillage will be done when the soil moisture content is favorable.

Deep tillage on areas to be reforested will be done approximately 3 to 4 months prior to tree planting to allow time for rainfall to settle the soil and fill the air pockets. The trees will be planted within the deep tilled area.

Deep tillage is to be done at least one inch deeper than the compacted layer.

Deep tillage may be done as part of the regular land preparations and/or planting operations, except on land that is to be reforested.

Additional Guidelines

Soil compaction causes many problems including:

- Reduced root growth
- Reduced available nutrients
- Increased amount and velocity of runoff
- Decreased infiltration
- Increased droughtiness of eroded soil
- Increased ponding
- Reduced air space
- Increased crusting and cracking of the soil surface
- Reduced seedling emergence
- Reduced effectiveness of subsurface drainage
- Reduced recharge of moisture in the subsoil
- Reduced crop yields if rainfall and/or irrigation is inadequate

Symptoms of soil compaction are:

- Drought stress - wilting during periods of relative good rainfall
- Non-uniform plant heights
- Excessively small and low productive plants when good fertilization and

other crop management and pest control practices are followed

- Plants with abnormal or excessively shallow root systems

Compacted layers of soil or plow pans:

- Occur in any soil
- Are present in most sandy Southern Coastal Plain soils
- Affect crop production more severely on less productive sandy soils than on high productive soils with a considerable silt and clay content
- Are usually 1-3 inches thick
- Are formed mainly as a result of the natural movement of soil moving with water through the soil
- Operating machinery with tires under high pressure increases the natural process of soil compaction
- Are located at or just below the tillage depth
- Up to 80% of soil compaction is caused by the season's first tillage trip.

Checking for Soil Compaction

Fields can be checked for soil compaction problems with a soil probe, wire flag, or other suitable device (Table 1).

- The soil moisture content has the greatest influence on the amount of soil compaction. The higher the soil moisture content, the lower the pressure needed to cause soil compaction
- Disking a wet soil will cause more soil compaction than any other tillage operation
- Generally, the higher the soil organic matter content, the less soil compaction

Determine if soil compaction problems are present by simply pushing the probe or wire into the soil and noting the resistance.

The best time to check for compacted soil layers is when the soil moisture is suitable for plowing.

For More Information:

Contact your local NRCS Office and Soil & Water Conservation District.

Table 1. Planned deep tillage

Tract/Field	Tillage Depth (Inches)		Method of Evaluation
	Benchmark	Deep Tillage	

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