

## **Chiseling and Subsoiling (acre)**

### **Definition**

Loosening the soil, without inverting and with a minimum of mixing of the surface soil, to shatter restrictive layers below normal plow depth that inhibit water movement or root development.

### **Purpose**

To improve water and root penetration and aeration.

### **Conditions where practice applies**

On suitable soils, chiseling is applicable if restrictive soil layers are less than 16 in. deep.  
On suitable soils, subsoiling is applicable if restrictive soil layers are more than 16 in. deep.

### **Planning considerations**

#### **Water Quantity**

1. Effects on the water budget components, especially on volumes and rates of runoff and infiltration.
2. Variability of the practice effects caused by seasonal weather variations.

#### **Water Quality**

1. Effects of slope and direction of tillage on sediment delivery to surface water.
2. Effects of the erosion and the movement of sediment, pathogens, and soluble and sediment-attached substances carried by runoff.
3. Potential for development of saline seeps or other salinity problems resulting from increased infiltration near restrictive layers.

#### **Specifications guide**

Specify soils to which each practice is adapted; time of operations, including time of optimum soil moisture; and spacing and direction of tillage if important. Write separate specifications for soils having restrictive layers at different depths.

U.S. DEPARTMENT OF AGRICULTURE  
Soil Conservation Service

Technical Guide  
Section IV  
Rev. April 1991

**CHISELING AND SUBSOILING (Acre)**

**Specifications Guide**

1. Chisel and subsoil when the soil moisture is low for maximum fracturing of the compacted layer, usually in the fall or late summer. Chiseling may be done as part of the regular land preparation at any time of year.
2. On sloping sites, perform the operation as near the contour as practical.
3. Where the practice is applied in the row prior to planting row crops, allow sufficient time for soil to settle before planting so that air pockets will not interfere with germination.
4. Depth of the operation should be set so as to break or shatter the restrictive layer of soil. The depth should be varied from time to time.
5. Space chisels so that the soil will be shattered between the furrows. The spacing of furrows will vary from 12 inches to 42 inches, depending upon depth, soil, degree of dryness and type of equipment.
6. Use a ripper or chisel-type plow so that the subsoil will not be brought to the surface.
7. If the operation is to be done once in a rotation cycle, it should be done prior to the crop offering greatest potential returns.
8. Subsoil acidity should be corrected for maximum results from the practice. Deep placement of lime and phosphate may be done at the same time subsoiling is done.
9. Chiseling and subsoiling is a practice which may pay under certain soil conditions. These conditions should be thoroughly studied before applying the practice.
  - a. Soils that would usually benefit from chiseling and subsoiling are soils with a traffic pan or soils developed for the most part from poorly graded soil material. Horizon textures of loamy sand, sandy loam, silt loam, fine sandy loam, very fine sandy loam, loamy fine sand, and sands are all conducive to pan formations.

- b. Soils that have pan problems generally have less than 1 percent organic matter.
  - c. Examples of soils that may benefit the most from this practice are Autryville, Durham, Granville, Kalmia, Kenansville, Norfolk, Orangeburg, Wagram, Varina, Dothan, Bonneau, Goldsboro, Blaney, Butters, Cowarts, Foreston, Fuquay, Marvyn, Ocilla, Pocalla, Suffolk, Vaucluse, and Wrightsboro. Almost any coastal plain mineral soil is subject to pan development if worked when wet.
  - d. Some soils may benefit only in isolated, unusual conditions. These are Appling, Durham, Granville, Faceville, Marlboro, and Gilead.
10. Poor management will lead to undesirable structure and tilth, especially on fine-textured soils. This practice will give temporary relief from problems associated with such compaction. Long-term solutions can be realized only through elimination or reduction of the causes.