SCOPE: Mulch-till systems can be designed to accomplish one or more of the following conservation purposes:

- Reduce sheet and rill erosion
- Reduce wind erosion
- Maintain or improve soil quality
- Increase plant-available moisture
- Reduce energy use.

Managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting the soil-disturbing activities used to grow and harvest crops in systems where the field surface is tilled prior to planting.

This practice includes tillage methods commonly referred to as mulch tillage where a majority of the soil surface is disturbed by tillage operations such as vertical tillage, chiseling and disking and also includes tillage/planting systems with relatively minimal soil disturbance but which do not meet the criteria for Residue and Tillage Management (No Till/Strip Till/Direct Seed, Code 329). It applies to stubble mulching on summer-fallowed land, to tillage for annually planted crops and to tillage for planting perennial crops.

It also includes some planting operations, such as hoe drills that disturb a large percentage of the soil surface during the planting operation and cropping systems in which the majority of surface area is disturbed during harvest operations.

Mulch-till systems can also provide secondary benefits when utilized effectively. Water quality, both onsite and offsite, will improve compared to conventional tillage systems. Air quality will be dramatically improved by reducing the amount of particulate matter suspended in the air, especially during dry cycles, throughout the rotation. Sedimentation will also be reduced due to surface residue and orientation of residue and the random roughness of the tilled soil.

CONSERVATION MANAGEMENT SYSTEMS

Mulch tillage is normally used as a component of a conservation management system. It should be used in conjunction with Crop Rotation, Nutrient Management, Pest Management, the buffer practices, and other practices needed on a site-specific basis to address natural resource concerns and landowner objectives. Major roles of the mulch-till component of a system include providing soil protection, reducing runoff, and improving soil quality by allowing the soil to build organic matter.

PRACTICE SPECIFICATIONS

Practice specifications are provided to assure the mulch till system meets the resource needs and producer’s objectives. The timing and type of tillage operations must be planned to ensure that adequate amounts of residue are left on the soil surface. Residue calculations are estimates that are highly dependent on such variables as operating speed, depth, field conditions, crop yield and other factors.
GENERAL SPECIFICATIONS

APPLICABLE TO ALL PRACTICE PURPOSES

- Residue to be retained on the field shall be uniformly distributed. Combines or other harvesting machines must be equipped with spreaders capable of distributing residue over at least 80 percent of the combine header width.

- Secondary removal of crop residue by baling or grazing is limited in order to retain the amount of residue needed to achieve the intended purpose(s).

- Residue shall not be burned.

- Anhydrous injectors, manure injectors, and similar equipment may need to be modified to operate in high residue situations.

- Tillage implements, such as field cultivators, chisels, or similar tools, should be selected and operated to leave a specified amount of residue on the soil surface.

- Planting implements should be equipped with coulters and disk openers designed to cut through surface residue.

- Row cleaners may be attached to the planters to move residue out of the row area to help warm and dry the seedbed.

- Weed control techniques must be carefully planned and monitored, yet sufficiently flexible, to compliment the system.

- Nutrient management must be carefully designed and monitored on a regular basis to optimize production and minimize potential non-point source pollution.

- Changes to the planned rotation and tillage must be approved prior to any site preparation or planting for the year of the deviation.

ADDITIONAL SPECIFICATIONS

APPLICABLE TO PURPOSES IDENTIFIED DURING PLANNING

REDUCE EROSION FROM WIND AND WATER

Current approved wind (WEPS-Wind Erosion Prediction System) and water (RUSLE2 ÷ Revised Universal Soil Loss Equation) erosion technology will be used to establish minimum specifications.

MAINTAIN OR IMPROVE SOIL QUALITY

Mulch-till reduces tillage and leaves the necessary amount of residue on or near the soil surface for soil improvement. Ensure that an evaluation of the cropping system using the current approved Soil Conditioning Index (SCI) procedure results in a positive trend. Ensure that calculations account for all operations and the effects of other practices in the management system.

INCREASE PLANT AVAILABLE MOISTURE

Residue shall be evenly distributed and maintained on the soil surface during the growing season or fallow period to retain soil moisture for crop use by enhancing infiltration and reducing evaporation. A minimum of 60 percent surface residue throughout the year is required to significantly reduce surface evaporation.
TRAPPING SNOW

Fall tillage operations shall leave the crop stubble in an upright position. Maintain a crop stubble height during the time significant snowfall is expected to occur to:

- at least 10 inches for crops with a row spacing of less than 15 inches;
- at least 15 inches for crops with a row spacing of 15 inches or greater; maintain these heights over at least 50% of the field.

Fall tillage operations should be as close as possible to perpendicular to the direction of prevailing winds during the winter.

REDUCE ENERGY USE

The Soil Tillage Intensity Rating (STIR) for the single crop establishment and harvest should less than or equal to 80.

Provide Food and Escape Cover for Wildlife

The Montana NRCS Wildlife Habitat Appraisal Guides will be used to evaluate wildlife habitat. Use Field Office Technical Guide (FOTG), Section IV, Practice Standard, Upland Wildlife Habitat Management (Code 645) for planning assistance and guidelines to provide food and cover for wildlife.