NATURAL RESOURCES CONSERVATION SERVICE

CONSTRUCTION SPECIFICATION

RESIDUE AND TILLAGE MANAGEMENT, NO-TILL/ STRIP TILL/DIRECT SEED

1. Scope

The work shall consist of performing cultural operations to produce crops or hay in a manner that maintains acceptable yields and provides adequate residues on the soil surface from harvest until after planting the next crop. The crop residues will be distributed evenly across the production area and left undisturbed by full-width tillage operations from harvest until planting of the next crop. Crops will be planted in narrow slots, tilled strips, or residue free strips. The intent of this practice is to provide surface cover to control soil erosion, conserve soil moisture, reduce energy consumption, reduce air particulate matter, reduce weed competition, and improve soil quality. The annual Soil Tillage Intensity Rating (STIR) for soil disturbing activities shall be no greater than 10 for no-till seeding, 15 for strip till seeding and 30 for direct seed. Practice design and application will be documented on the Cropland Field Management Record in the Revised Universal Soil Loss Equation, Version 2 (RUSLE2).

NOTE: Specific program guidance may be more restrictive on a number of these criteria. Refer to the program manual for specific requirements.

2. Materials

Chemicals used in performing this practice shall be federally, state, and locally registered and shall be applied strictly in accordance with authorized registered uses, directions on the label, and other federal, state, and local policies and requirements.

Chemical containers shall be properly stored and disposed of in a safe manner according to state and local ordinances or procedures.

Planters or drills shall be equipped to plant directly through untilled residue or in a tilled seedbed prepared in a narrow strip (not exceeding one-third of the full row-width) for each row through the use of planter attachments such as rotary hoes, sweeps, multiple coulters, or row cleaning devices.

Combines used to harvest small grains shall be equipped with devices that will chop and distribute the crop residues over approximately 80 percent of working width of the header.

Annual STIR values and Soil Condition Index (SCI) values are determined through the use of the RUSLE2 http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm.

Tillage Equipment Pocket Identification Guide ftp://ftp-fc.sc.egov.usda.gov/IA/intranet/Tillage.pdf will serve as a visual guide to operation descriptions in RUSLE2.

3. Cultural Operations

Managing for Soil Erosion Control. In rainfall erosion areas, the tillage and planting system shall provide enough surface cover to accomplish sheet and rill erosion objectives as determined by the current approved sheet and rill erosion prediction method. The soil shall be left undisturbed from harvest to planting except for nutrient injection. Approved implements are: no-till and strip-type fertilizer and manure injectors and applicators; similar implements that only disturb narrow strips or slots. Planting or drilling shall be accomplished in a narrow in-row seedbed or slot created by coulters, row cleaners, disk openers, in-row chisels or rotary tillers. Planters will be equipped to plant directly through untilled residue or in a narrow tilled strip along each row that is prepared prior or at seeding time.

In wind erosion areas, the tillage and planting system shall maintain the amount of residue needed to accomplish soil erosion protection objectives as determined by the current approved wind erosion prediction method. The soil shall be left undisturbed from harvest to planting except for nutrient injection. Planting or drilling shall be accomplished in a narrow seedbed or slot created by coulters, row cleaners, disk openers, in-row chisels, or rotary tillers.

Planting shall be performed directly into old crop residues, annual cover crop, or chemically killed sods.

Follow fragile residue producing crops with non-fragile residue producing crops and follow low residue producing crops with high residue producing crops. Do not use fragile, low residue producing crops more than two consecutive years.

Residue Types

Nonfragile	Fragile
Alfalfa or legume hay	Canola/Rapeseed
Barley *	Dry beans
Buckwheat	Dry peas
Corn	Fall seeded cover crops
Flaxseed	Lentils
Forage Silage	Mustard
Grass Hay	Potatoes
Millet	Safflower
Oats *	Soybeans
Pasture	Sugar Beets
Popcorn	Sunflowers
Rye *	Vegetables
Sorghum	
Triticale *	
Wheat *	

* If a combine is used with a straw chopper or otherwise cuts straw into small pieces in harvesting small grain, then the residue should be considered as being fragile.

Managing for Available Soil Moisture. In systems designed to maximize available soil moisture, crop stubble should be left standing during the winter period to increase the potential for snow catch. When shredding of stalks and stubble are included in the system, these practices should be conducted after primary snowfall periods to reduce evapo-transpiration at the soil surface. The annual STIR value shall not exceed 20.

Managing for Pest Reduction. Maintain a diverse crop rotation that will disrupt life cycles and not provide carryover diseases. Manage chemical diversity to reduce the potential of resistance to applied chemicals.

Spot treat perennial weed populations with chemical applications during the period when plant translocation to the root system is most advantageous for complete control. Early detection and immediate treatment will eliminate the need for more costly eradication or control.

Managing insect populations requires early detection and control to keep populations below an economic loss threshold. Monitor border areas for potential population expansions and control prior to infestations of the cropping area where feasible.

Weed control shall be accomplished primarily with herbicides, crop rotations, and cover crops.

Where cultivation is used for emergency weed control or spot tillage treatment is required for leveling ruts or similar operations, tillage shall be limited to the specific area of concern and to those operations which minimize burial of the crop residue.

Managing for Wildlife Food and Cover. Residue height, amount, and time period shall be determined using and approved habitat evaluation procedure. Residues shall not be removed unless it is determined by the habitat evaluation procedure that removal would not adversely affect habitat values.

Determine the primary management purpose or objective when planning pest management activities. In a wheat-fallow cropping system, it has been determined that eliminating summer post harvest weed control applications have little or no detrimental effects on available soil moisture, but is very beneficial to pheasant populations.

4. Other Requirements

Residue shall not be burned.

Partial removal of residue by means of haying or grazing shall be limited to the amount needed to meet the desired objectives.

Any make of rotary harrow is considered full-width tillage and is applicable to Conservation Practices 345, Residue and Tillage Management Mulch Till, or 344, Residue and Tillage Management, Seasonal, only and will not be considered as a component of a Conservation Practice 329, Residue and Tillage Management No-Till/Strip Till/Direct Seed.

The owner, operator, contractor, or other persons shall conduct all work and operations in accordance with proper safety codes for the type of equipment and operations being performed with due regard to the safety of all persons and property.

Planning and documentation requirements:

- Identified problem
- Producers objectives
- Location map – field numbers, map, or sketch of the area planned
- Measured acres
- Cropping sequence and planned residue, kind, amounts, percent surface cover required, and orientation
- Critical time periods to maintain residue
- Documentation of applied residue in pounds or percent by planning unit