A-29. Conservation Tillage

Practice Description

Conservation tillage involves the planting, growing and harvesting of crops with minimal disturbance to the soil surface through the use of minimum tillage, mulch tillage, ridge tillage or no-till. The amount of crop residue coverage is higher and soil disturbance is lower when compared to conventional or high tillage methods. Greater crop residue coverage and lower disturbance to the soil surface protect against the erosive forces of wind and precipitation.

Figure A-29-1. Corn growth with crop residue. Source: CTIC

CBP Definition(s)

Any tillage routine that achieves less than 15 percent crop residue coverage immediately after planting each crop is considered conventional tillage and does not qualify for conservation tillage practice reductions.

Low Residue Tillage: A conservation tillage routine that involves the planting, growing and harvesting of crops with minimal disturbance to the soil in an effort to maintain 15 to 29 percent crop residue coverage immediately after planting each crop. Some common practices that qualify under this definition are: NRCS practice code 329; strip tillage and no-tillage, and; reduced tillage as defined by the Conservation Technology Information Center (CTIC).

Figure A-29-2. Ridge till rows. Source: CTIC

Conservation Tillage: A conservation tillage routine that involves the planting, growing and harvesting of crops with minimal disturbance to the soil in an effort to maintain 30 to 59 percent crop residue coverage immediately after planting each crop. Some common practice that qualify under this definition are: NRCS practice code 345; mulch tillage as defined by the CTIC, and; ridge tillage as defined by CTIC.

High Residue, Minimum Soil Disturbance Tillage: A conservation tillage routine that involves the planting, growing and harvesting of crops with minimal disturbance to the soil in an effort to maintain at least 60 percent crop residue coverage immediately after planting each crop.

Specifications or Key Qualifying Conditions

The tillage routine must maintain 15 percent or greater crop residue coverage immediately after planting to be eligible for any of the BMPs defined above. There are no additional specifications or qualifying conditions beyond those described in the definitions above.

Nitrogen, Phosphorus and Sediment Reductions

Nutrient reductions vary based on hydrogeomorphic region (HGMR), while sediment reductions are consistent across all regions.

Table A-29-1. Nitrogen, Phosphorus and Sediment Efficiency Value Reductions for Tillage Practices

HGMR	N Reductions			P Reductions			Sediment Reductions		
	Low Residue	Conservation Tillage	High Residue	Low Residue	Conservation Tillage	High Residue	Low Residue	Conservation Tillage	High Residue
Appalachian Plateau, Siliciclastic	0.05	0.1	0.14	0.07	0.17	0.27	0.18	0.41	0.79
Appalachian Plateau, Carbonate	0.05	0.1	0.14	0.07	0.27	0.38	0.18	0.41	0.79
Blue Ridge	0.05	0.1	0.14	0.08	0.5	0.63	0.18	0.41	0.79
Coastal Plain Dissected Upland	0.02	0.04	0.12	0.08	0.35	0.47	0.18	0.41	0.79
Coastal Plain Lowland	0.02	0.04	0.12	0.06	0.02	0.11	0.18	0.41	0.79
Coastal Plain Upland	0.02	0.04	0.12	0.07	0.16	0.26	0.18	0.41	0.79
Mesozoic Lowland	0.05	0.1	0.14	0.07	0.21	0.32	0.18	0.41	0.79
Piedmont Carbonate	0.05	0.1	0.14	0.09	0.6	0.74	0.18	0.41	0.79
Piedmont Crystalline	0.05	0.1	0.14	0.09	0.58	0.71	0.18	0.41	0.79
Valley and Ridge Carbonate	0.05	0.1	0.14	0.09	0.57	0.71	0.18	0.41	0.79
Valley and Ridge Siliciclastic	0.05	0.1	0.14	0.08	0.49	0.62	0.18	0.41	0.79

Applicable Land Use Types (or other load sources) Treated by the BMP:

- Full season Soybeans
- Grain with Manure
- Grain without Manure
- Silage with Manure
- Silage without Manure
- Small Grains and Grains
- Small Grains and Soybeans
- Specialty Crop High
- Specialty Crop Low
- Other Agronomic Crops

Because many of the land uses listed above represent transient crops within a multi-year rotation, it is not recommended that states track and report this level of detail. Instead, it is recommended that states report these acres on the land use group, "Crop," which contains all of the above individual land uses.

Figure A-29-3. Corn (left) and soybean (right) residue cover percentages (25, 50, 75, 90). The percentage of residue coverage increases from top to bottom for each crop in a column. Source: University of Nebraska Extension

Brief Description of BMP Simulation in the Model

All conservation tillage practices are *Efficiency Value BMPs*. Runoff from applicable load sources are reduced by the efficiency values listed in Table A-29-1. For example, if a state submits that 100 percent of acres within a county in the Appalachian Plateau Siliciclastic region are covered by High Residue Tillage, then runoff from all acres will be reduced by 14 percent. If however, only 50 percent of acres are reported for the same practice, then runoff from all acres will be reduced by 7 percent.

Annual or Cumulative? Annual (1-year credit duration)

Can this practice be combined with other BMPs? Yes. See [insert link to overview] for example credit calculation for multiple practices.

Key Elements for State BMP Reporting through NEIEN

- *BMP Name:*
  - Low Residue Tillage may be reported under the names: Reduced Tillage
  - Conservation Tillage may be reported under the names: Conservation Tillage; Mulch Tillage; No Tillage, and; Ridge Tillage
  - High Residue, Minimum Soil Disturbance may be reported under the name: High Residue Tillage Management
- *Measurement name:* Acres
- *Land Use:* Approved NEIEN agricultural land uses; if none are reported the default will be CROP
- *Geographic location:* Approved NEIEN geographies: County; County (CBW only); Hydrologic Unit Code (HUC12, HUC10, HUC8, HUC6, HUC4); State (CBW only)
- *Date of implementation:* Year residue was observed.

Additional Information

Expert panel report: [link forthcoming]

Example USDA NRCS National Conservation Practice Standards: https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/cp/ncps/

Conservation Technology Information Center: https://www.ctic.org/

Version and History Statement

This info sheet was first published on MM DD, YYYY and reflects the BMP definitions and reductions approved by the WQGIT in MONTH YEAR (December 2016).

All BMP effectiveness estimates are subject to potential future reviews according to the availability of new scientific information and CBP partnership needs, as defined in the BMP Review Protocol.