

## Agriculture and Forestry Technical Work Group

### Draft Policy Option: A6. Conservation Tillage/No-Till; Decrease Summer Fallow; and Increase Winter Cover Crops

#### 1. Policy Description:

- a. Lay description of proposed policy action: The amount of carbon stored in the soil can be increased by the adoption of conservation tillage. Reducing mechanical soil disturbance reduces the oxidation of soil carbon compounds and allows more stable aggregates to form. In addition to soil carbon benefits, conservation tillage has numerous co-benefits including reduced wind and water erosion, reduced fuel consumption and improved wildlife habitat.

Other management practices such as decreased summer fallow or an increase in winter cover crops could also affect soil carbon levels, however opportunities for significant implementation for these practices in NM were not identified.

- b. Policy Design Parameters:

- i. Implementation level(s) beyond BAU: *Program goal of bringing 650,000 acres of cropland into new management practices and per acre soil carbon storage rate improvements of 0.22 T CO<sub>2</sub>/ac/y; total of ~140,000 T CO<sub>2</sub> equiv. per year.*
- ii. Timing of implementation: *650,000 acres of cropland brought into no till management practices from 2007-2015; 1,300,000 acres in 2025.*
- iii. Implementing parties: *Local Agricultural Extension Offices or USDA Soil Conservation Service Field Offices.*

- c. Implementation Mechanism(s): Indicate which mechanisms are to be used, and describe the specific approach that is proposed

- i. Information and education-NM Extension and NRCS Field Offices have educational programs in place to encourage farmers to adopt conservation tillage practices.
- ii. Technical assistance-There is sufficient technical assistance available in the Extension Service and NRCS Field Offices and in farmer groups.
- iii. Funding mechanisms and or incentives-Conservation Security Program incentives provide financial incentives to adopt conservation tillage, however, the funding to extend CSP to cover all cropland is currently lacking.

- iv. Voluntary and or negotiated agreements – participation in federal conservation programs is voluntary
- v. Codes and standards
- vi. Market based mechanisms-Some NGOs are attempting to organize demonstration projects to deliver carbon sequestration benefits to global markets. The slow rate of accumulation of soil carbon and the uncertainty associated with dryland farming will limit the attractiveness of New Mexico based projects to private sector investors. However, federal programs, particularly the Conservation Security Program, are intended to expand to cover all eligible land and to provide incentives for adoption of management practices such as conservation tillage.
- vii. Pilots and demos-Currently, there is a need to support Pilot projects to demonstrate the technical (measurement, monitoring and verification) feasibility of private sector projects in the state.
- viii. Research and development-Improved measurement (direct estimates of soil carbon), monitoring (estimates of acres under different tillage regimes) and verification (model integration of direct measurement estimates and acres of adoption) are required to reduce the uncertainties to an acceptable level.
- ix. Reporting-The US DOE Voluntary Greenhouse Gas Emission Reduction Reporting System (1605b) is currently structured to accept conservation tillage as an emission reducing practice.
- x. Registry

2. BAU Policies/Programs, if applicable:

- a. Currently, there are about 275, 000 acres in conservation tillage. There are no financial incentives to adopt. The Conservation Security Program rewards farmers financially for implementing conservation tillage. CSP is currently limited to less than 5% of New Mexico cropland, but should be expanding over the next decade to include the majority of land.
- b. Etc.

3. Types(s) of GHG Benefit(s):

- a. *CO<sub>2</sub>: Reducing tillage and soil disturbance slows the breakdown of plant material on the soil surface and in the root zone, accelerating the microbial processes that stabilize carbon and protecting carbon from oxidation, inhibiting the release of carbon back into the atmosphere.*

- b. CH4: *Not applicable*
  - c. N2O: *Not applicable*
  - d. HFC's, SFC's: *Not applicable*
  - e. Black Carbon: *Not applicable*
4. Types of Ancillary Benefits and or Costs, if applicable:
- a. *Reduced tillage saves labor, fuel (and associated emissions), and machinery wear that would be spent tilling the land.*
  - b. *Increased carbon content of the soil increases infiltration, water and nutrient holding capacity and improves productivity of cropland.*
  - c. *Reduced tillage increases plant cover on the soil surface and reduces wind and water erosion.*
  - d. *Crop residue helps hold moisture in the soil and improves water quality by preventing runoff.*
5. Estimated GHG Savings and Costs Per MMTCO<sub>2</sub>e:
- a. Summary Table of:
    - i. GHG potential in 2012, 2020, 2050 (Table 1)
    - ii. Net Cost per MMTCO<sub>2</sub>e in 2012, 2020, 2050- There are relatively few costs associated with adoption of conservation tillage. The primary reluctance to adopt on the part of farmers is based in the risk of reduced yields during the 3-5 transition from conventional tillage to conservation tillage.
6. Data Sources, Methods and Assumptions:
- a. Data Sources-Conservation Tillage Information Center County Level Estimates (Table 1)
  - b. Quantification Methods-attached
  - c. Key Assumptions – Assumptions regarding adoption of conservation tillage practices are based entirely upon the funding and implementation of federal conservation programs such as the Conservation Security Program. If these programs are funded in the 2007 and 2012 Farm Bills, it is assumed that approximately one-half of the eligible acres will be converted to conservation tillage by 2015 (10 years) and the remaining one-half will be converted over the following 10 years. Experience has shown that once conservation tillage is adopted, there is little return to conventional tillage. A further assumption is that there is year-to-year consistency in the application of tillage practices.

7. Key Uncertainties if applicable:
  - a. Benefits n/a
  - b. Costs n/a
  
8. Description of Ancillary Benefits and Costs, if applicable:
  - a. All ancillary benefits described above have a well-developed research support base.
  
9. Description of Feasibility Issues, if applicable:
  - a. Description of issue #1
  - b. Description of issue #2
  - c. Etc.
  
10. Status of Group Approval:
  - a. Pending
  - b. Completed
  
11. Level of Group Support:
  - a. Unanimous Consent
  - b. Supermajority
  - c. Majority
  - d. Minority
  
12. Barriers to consensus, if applicable (less than unanimous consent):
  - a. Description of barrier #1
  - b. Description of barrier #2
  - c. Etc.

**Table 1. New Mexico 2004 CTIC Crop Residue Management Survey**

County	Total Planted Acres	Current Conservation Tillage (ac)	Potential for Conversion	50% Conversion by 2015
<a href="#">Bernalillo</a>	2,351	0	750	375
<a href="#">Catron</a>	600	0	600	300
<a href="#">Chaves</a>	58,800	0	44,800	22,400
<a href="#">Cibola</a>	752	0	698	349
<a href="#">Colfax</a>	11,400	0	3,000	1,500
<a href="#">Curry</a>	628,000	223,000	396,000	198,000
<a href="#">De Baca</a>	4,820	0	3,300	1,650
<a href="#">Dona Ana</a>	103,172	0	56,990	28,495
<a href="#">Eddy</a>	62,983	0	25,940	12,970
<a href="#">Grant</a>	2,000	0	2,000	1,000
<a href="#">Guadalupe</a>	5,543	0	4,500	2,250
<a href="#">Harding</a>	3,795	700	1,000	500
<a href="#">Hidalgo</a>	17,989	0	10,400	5,200
<a href="#">Lea</a>	90,515	5,600	74,000	37,000
<a href="#">Lincoln</a>	0	0	0	0
<a href="#">Los Alamos</a>	0	0	0	0
<a href="#">Luna</a>	45,140	0	31,000	15,500
<a href="#">Mc Kinley</a>	1,800	0	1,200	600
<a href="#">Mora</a>	800	0	700	350
<a href="#">Otero</a>	8,316	0	2,000	1,000
<a href="#">Quay</a>	220,240	24,500	190,000	95,000
<a href="#">Rio Arriba</a>	4,600	0	4,000	2,000
<a href="#">Roosevelt</a>	404,613	18,000	367,000	183,500
<a href="#">San Juan</a>	124,851	3,800	68,000	34,000
<a href="#">San Miguel</a>	1,175	0	1,175	588
<a href="#">Sandoval</a>	1,975	0	1,500	750
<a href="#">Santa Fe</a>	22,600	0	15,000	7,500
<a href="#">Sierra</a>	8,870	0	5,000	2,500
<a href="#">Socorro</a>	2,700	0	1,700	850
<a href="#">Taos</a>	535	0	500	250
<b>Totals</b>	<b>1,840,935</b>	<b>275,600</b>	<b>1,312,753</b>	<b>656,377</b>