

Converting Expired CRP to Cropland - Soil Quality and HEL Concerns

USDA Natural Resources Conservation Service - North Dakota

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Soil Quality

What is soil quality? Simply put, it is the soil's capacity to function. This includes sustaining productivity and biological activity, regulating water flow or infiltration, storing and cycling nutrients.

Under CRP, a healthier soil has developed beneath the established grass vegetation. For years, soil erosion has been controlled; soil and water quality has been enhanced; organic matter, soil structure and water infiltration have improved, and the movement of sediment, fertilizer, and pesticides has been reduced. The protective vegetative cover (grass) has also provided quality wildlife habitat. There have been several studies that have looked at potential management alternatives to bring expired CRP acres or other sod-based systems back into crop production. Consider a cropping system that will minimize the impacts to the soil quality while sustaining the benefits. Converting expired CRP acres to cropland is an undertaking that should be planned carefully, especially when land is considered Highly Erodible Land (HEL).

Does converting CRP land back into crop production mean losing all these stewardship benefits? No, but it does require proper planning and good management. Below are some items to consider:

- The planting system you'll use on each crop
- Crops and rotations you want to plant
- What are the soil fertility concerns (nutrient management planning)
- Which areas of the fields will be planted and which should remain in grass/legume cover as buffers
- Impacts on soil and water quality
- Are the fields Highly Erodible Land (HEL) and what management is needed for Conservation Compliance



Soil Erosion and Highly Erodible Land

Depending on the planting system, soil erosion rates can increase when fields with steep or sandy soils that may be Highly Erodible Land (HEL) are cropped compared to land maintained in sod. Exposing the soil to the erosive forces of wind and water seriously deteriorates the soil's ability to function properly. Soil loss rates depend on the crop rotation, planting system, tillage and crop residue left on the soil surface. No-till systems provide the best soil erosion control of any annual cropping system. Diverse crop rotations that include different crop types, cover crops and/or forages should be considered. The Conservation Compliance (HEL) provisions require USDA program participants who produce annual agricultural commodities on HEL fields to apply an approved conservation system on those HEL fields.

Planting System: No-till vs. Tillage

No-till is the preferred method when converting grassland to cropland. Research indicates soil managed



under a grass-legume sod results in significant soil quality improvements, namely in organic matter levels, aggregate stability, total pore space, and soil infiltration rates. These improvements result in soil that is in better condition to grow plants. Soils in CRP fields are ideally suited for a no-till system because they have the needed physical, chemical and biological qualities that will support successful no-till systems. If tillage is used, it should be restricted to the first year and only involve implements (harrows, blade/roller, aerator, etc.) that lightly disturb the top few inches of soil leveling rough areas in the field. Conventional tillage requiring several operations can destroy many of the soil quality improvements gained under CRP in one year.

Crops and Rotation Options

Plant residue protects the soil surface and feeds your soil. Some of the best crops are those that produce large amounts of crop residue like corn or small grains. Crops with genetic traits like herbicide tolerance or pest resistance or crops that form a dense canopy like drilled soybeans, small grains, or alfalfa/clover hay provide the farmer options for pest management. Corn, wheat and winter cereals are good choices to plant into CRP cover where residue, nutrient and pest management is adequate. Soybeans may also be a good crop for the first year after the conversion, but if they have not been previously grown in the field, inoculate seeds with proper strain of Rhizobia to maximize nodulation.

In some farm systems, cover crops are planted as a transition crop from the grass sod to cropland. Cover crops can be used for a cash crop, forage or hay, green manure or as a pest, nutrient or residue management treatments in the field. Another consideration for some producers is organic farming. Land that has been in CRP may meet some of the requirements of USDA's National Organic Program certification. Consult with local NRCS/SCD staff to find a crop rotation that controls soil erosion and maintains the soil quality benefits.

Fertility

It's crucial to know the current soil fertility levels before planting. Soils under long-term perennial vegetation are much different than soils that have been cropped regularly over the last decade. Soil tests to determine fertility should be completed before fields are returned to production allowing ample time to schedule and apply fertilizer required for planned crops. In areas where soil test nitrogen levels are low, consider applying starter fertilizer at planting. Consider use of annual legumes as a cover crop prior to the cash crop year. These plants have a low C:N ratio and fix atmospheric nitrogen that is readily available to following crops.

Impacts on Soil and Water Quality

The CRP has given North Dakota producers the opportunity to protect their land and demonstrate sound stewardship principles while providing significant natural resource benefits. Soil erosion, soil quality and water quality have all been positively impacted by the establishment of vegetation, grasses, trees and shrubs. It is important to consider impacts to these resources as you decide whether to transition CRP acres back into agricultural production. Check with your local NRCS/SCD office for specific erosion estimates for different cropping systems.

Soil Quality

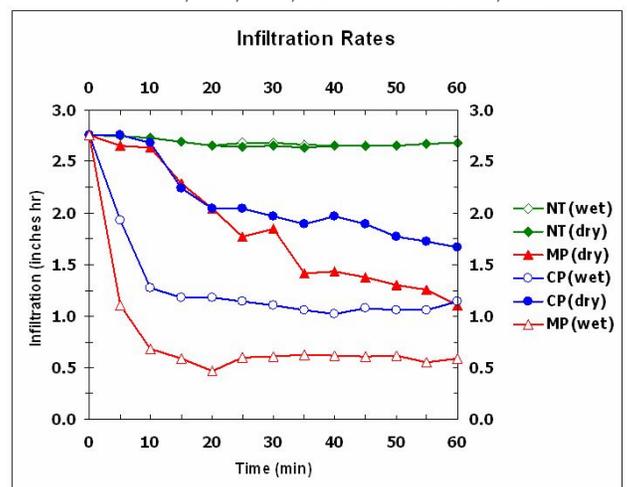
Valuable soil quality benefits are a result of the land protected and covered in long-term grass vegetation. Generally, soil quality indicators, such as aggregate stability, soil biology, fertility, and water infiltration will decrease when annual cropping systems are compared to grasslands. In order to maintain these soil quality gains, select an appropriate tillage and management system. Many studies have shown dramatic decreases in soil organic matter in surface layers in short periods of time after the grass sod is plowed down. Research indicates a no-till cropping system provides the greatest potential to maintain the soil quality improvements found in soils under CRP.

Water Quality

By returning land to crop production, the potential exists for increased soil erosion, use of agricultural pesticides, and fertilizers thereby increasing the potential for water quality concerns. Land managed under CRP cover has produced dramatic reductions in soil erosion and sedimentation, nutrients and pesticides delivered to surface water. Tillage and management decisions directly impact the potential for surface water pollution from sedimentation. Use of a no-till system, proper nutrient management and Integrated Pest Management (IPM) is recommended to reduce potential adverse impacts to surface water.

For additional information contact your local USDA-NRCS office.

Infiltration on CRP Land Converted to Cropland Production - Poinsett-Kransburg Soils - White, SD
Lindstrom, M. J., et. al., J. Soil and Water Cons., 1998



NT-no-till, MP-moldboard plow, CP-chisel plow