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NRCS Natural Resources Conservation Service

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**Fact Sheet**
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# Converting Sod to Grain Crops: The RIGHT Way

## The Big Decision...

Converting idle or set aside acres to cropland is an endeavor that should be planned carefully, especially when that land is considered Highly Erodible Land (HEL).

Truth be told, a healthier soil has developed beneath that existing grassland or prairie vegetation. Erosion has been controlled; water quality has been enhanced; the movement of sediment, fertilizer, and chemicals has been reduced. The protective vegetative cover (grass) has also provided significant wildlife habitat. This begs the question: Does converting that land back into crop production mean losing all those stewardship benefits? No. All it takes is proper planning and good management.

Landowners considering converting prairie or pasture back into cropland, should consider these items:

- The crops and rotations you want to plant; proper fertilizer, pH, and pest management planning.
- The tillage system you'll use on each crop - For fertilizer and pest management application times and methods.
- Areas on your farm that should remain and be maintained in existing vegetation–grassed waterways, field borders/turn strips, filter strips, and severely eroded areas too steep or poor for crop production.
- The impacts this decision will have on resources--soil erosion, soil quality, water quality, and wildlife habitat.
- Economic impacts of land returned to crop production--costs as well as profits.
- Impacts of cropping on time and labor demand, equipment, and other management needs.

## Management Considerations

### *Crops and Rotation Options*

On land subject to erosion, the best crops are those that produce large amounts of crop residue like corn, sorghum, or small grains or crops that form a dense canopy like drilled soybeans, small grains, or alfalfa/clover hay. Residue protects the soil surface. Corn is a good crop to follow idle land operations if nutrient and pH levels are adequate. Recent data indicate 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 Rhizobia to provide nitrogen.

Consult with local NRCS/SWCD staff to find a crop rotation that controls soil erosion and maintains the benefits of increased organic matter, soil structure, and increased water infiltration. Land involved in USDA's Conservation Reserve Program (CRP) may meet some requirements of USDA's National Organic Program certification. Learn more about the certification process at: http://www.ams.usda.gov/nop/indexIE.htm

### *Tillage*

No-till is the preferred method when converting grassland to cropland. Research indicates grass-legume sod results in significant soil quality improvements, namely in organic matter levels, structural stability, total pore space, and soil infiltration rates. These improvements result in soil that is in better condition to grow plants. Research shows equal yields in corn and soybeans sown by both no-till operations and plowing. Tillage, however, can eliminate soil health improvements in as little as one year. Tillage oxidizes organic matter quickly, reducing the structural stability of soil aggregates and natural pore space. The loss of organic matter also reduces availability of plant nutrients. Soils in pasture or prairie are ideal for no-till methods because they lack some of the conditions (compaction and crusting) that limit no-till success in excessively tilled soils.

### *Fertility*

It's crucial to know current soil fertility levels before planting. Soils on idle land are much different than soils that have been cropped regularly over the last decade. If possible, soil tests should be taken 1 to 2 years before the ground is returned to production in order to provide ample time to apply lime and fertilizer required for new crops. Generally, phosphorus and potassium levels will have changed very little since the land was established to grass. Soil pH levels under grass and prairie tend to revert to native soil levels prior to agricultural production. In no-till areas where soil test levels are low, consider applying starter fertilizer when planting corn. Starter fertilizer has not shown benefits when planting soybeans. Take soil samples at a depth of 7 inches.

### *pH*

Since tillage is not used in a no-till system, lime is often over applied. This can result in a high surface pH which causes herbicide failure and/or carryover. An early soil test allows application of limestone to adjust pH levels to 6.0 to 6.5 since it takes approximately 6 months for lime to increase soil pH levels. Most limestone application rates are based on incorporation depth, therefore, apply 1/2-1/3 recommended amounts unless the laboratory has already adjusted your lime needs based on needs of a no-till system. Monitor soil pH of the top 2 inches because very low or high pH levels can interfere with herbicide performance or cause carry-over crop damage.

### *Nitrogen*

Because very little legume remains in most grasslands after 10 years, little, if any, nitrogen (N) credit can be taken. NRCS suggests following *Illinois Agronomy Handbook* recommendations to determine N needs.

Research shows that placing N below the soil surface results in consistently higher yields in no-till because N fertilizers that contain urea volatilize when surface-applied. However, NBPT, a urease inhibitor, allows broadcast application of urea with lesser concern of N volatilization.

### *Phosphorous and Potassium*

If you plan to use no-till methods and P and/or K is low, use starter fertilizer and consider deep banding. Refer to current University of Illinois recommendations.

## Pest Management

When bringing grassland into crop production, landowners must manage for pests of all kinds—weeds and insects.

### *Weeds*

Research in Illinois and other Midwestern states has shown consistent perennial grass weed control from a combination fall plus spring herbicide application program. This has been found successful especially for tougher to control cool season grasses such as smooth bromegrass and orchard grass. However, regional differences in grass control can be noted.

Cool season grass control with translocated herbicides, such as glyphosate, should be applied at certain growth stages to be effective. The growth stages where glyphosate will be most effective are: in the spring at boot stage or late fall before the first killing frost, when perennial plants store food reserves.

For central and northern Illinois, a combination of fall plus spring application is preferable over spring only treatment. The combination treatment offers more effective control and is lower in cost than a spring only treatment since spring only applications require higher herbicide rates. Southern Illinois producers can use either program, as an earlier spring growing season allows cool season grasses to reach boot stage prior to corn planting.

Glyphosate in the fall (late September, early October, before a killing frost occurs), followed by glyphosate in the spring (on grass at least 8"-10" in height) provides good control of cool season grasses. Ammonium sulfate added at the rate of 17 lbs./100 gallons water can improve control.

Fall glyphosate rates of 1-2 lbs. ai/acre are recommended. Some research shows that mowing in July prior to fall spraying significantly increases perennial grass control. Perennial broadleaf weeds could be a major weed problem. Producers should scout existing fields for invading perennials such as milkweed, ironweed, hemp dogbane, trumpetcreeper, brambles, trees/shrubs, etc. Treat perennial broadleaf weeds in the fall. Adding a hormone herbicide such as 2, 4-D or dicamba to the glyphosate improves control of perennial broadleaves. Hormone type broadleaf herbicides can reduce control of perennial grasses by antagonizing the glyphosate at lower glyphosate rates. Higher rates of glyphosate should also be used in the fall where contact herbicides such as paraquat are planned for spring burndown. Spot treat grassland areas of with a 2x rate to provide improved control of woody perennial broadleaves.

Spring treatments of glyphosate or paraquat plus atrazine can be used where planting corn or milo in fields fall treated with glyphosate. Orchard grass and smooth bromegrass are difficult to control with a spring only treatment, therefore higher burndown herbicide rates are required. It may or may not be recommended to tank mix residual herbicides with spring glyphosate applications. Like fall applications, adding a hormone type herbicide will improve control of broadleaf weeds. Where used, observe the label specified interval before planting sensitive crops such as soybeans.

### *Insects*

Regardless of your tillage system, wireworms, white grubs, seedcorn maggot and beetle, and billbugs may present a problem in corn planted into sod. Wireworm bait stations should be used to determine if corn seed protection is necessary. Consult current University of Illinois recommendations.

Several soil insecticides are labeled for wireworm control. In addition to wireworms, white grub control may also be needed. Consult soil insecticide labels for pest species. A labeled soil insecticide will protect the seed and the corn plant. A planter box seed treatment will provide wireworm protection to the seed; however, it will not protect the corn plant.

Common stalk borer and armyworm may sometimes infest converted corn fields. Armyworms overwinter as partially grown larvae, but adult moths may migrate into Illinois each spring. Those converted fields that were fall treated with a herbicide will not be attractive sites for armyworm moths to lay eggs.

Adult Stalk borer moths actively lay eggs in late August and September. The insect overwinters as an egg. After eggs hatch in spring, partially grown stalk borer larvae will infest corn as they out grow their previous weed host. If present, scouting corn during May/June is necessary to identify their movement. Insecticide treatment is effective only if larvae are outside host plant. Several management options are available for stalk borer: Plant soybeans, since they are not a very suitable host or burn down the cover early enough that newly hatched larvae do not have any host to feed on, and die from starvation. Finally, an insecticide treatment, properly timed, will be effective as larvae migrate into the corn plant.

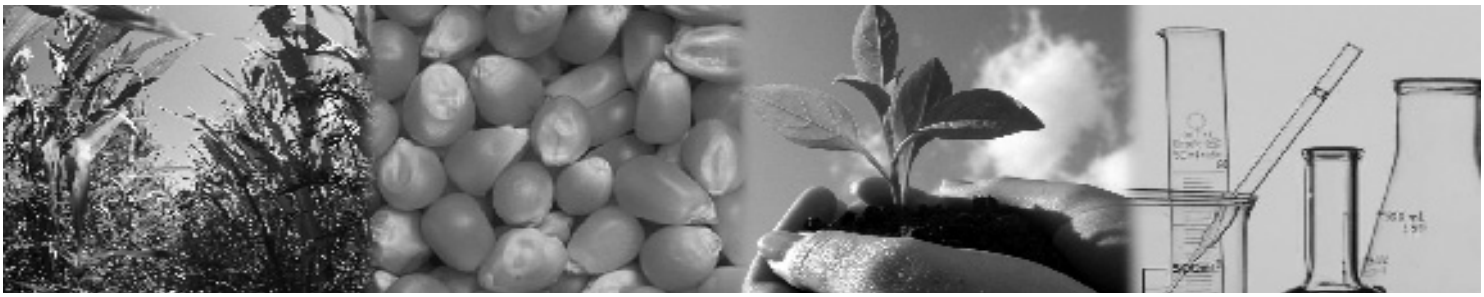
Black cutworm moths can lay eggs in residue. Scout emerging corn for cutworm damage and treat if cutworm damage exceeds 3% and cutworms are still present. Consult current University of Illinois recommendations.

Vole populations can sometimes reach high levels in undisturbed sods. Scout converted fields for vole colonies in early spring, prior to corn planting. Research confirms five or more colonies per acre is the threshold level for treatment. There are several options available including: alternate feeds, and habitat modification. Alternate feeding of 4 bushels cracked corn or 2 bushels whole kernel corn, applied 1-2 days prior to planting will permit seed corn to emerge and grow beyond damage by voles. Killing of vegetation 30 or more days prior to planting corn has also shown to be very effective in reducing vole damage.

Insect pests possible in soybeans include seedcorn maggot, white grubs, wireworms, and possibly grape colaspis. Consult current University of Illinois recommendations. As with corn, a fall burndown of existing vegetation will reduce potential insect damage in soybeans. Always follow all label directions when using insecticides.

### *Non-crop Areas*

Many agricultural areas were enrolled in federal set-aside programs or used as pasture because they not suitable for crop production. These may be areas severely eroded, rocky, steep, or have other conditions that make crop production unprofitable, difficult, or dangerous. These areas should be identified in the field and left in sod cover for forage



production or planted to trees/shrubs or left idle for wildlife habitat. Other areas that should remain in sod include steep areas that would be end rows if cropped, drainageways that need sod cover to prevent gully erosion, and filter strips along streams or lakes to prevent access by sediment, nutrient, and pesticide pollutants. If filter strips are established, ensure they are at least 32 feet wide on flat slopes and 117 feet wide on steep slopes. Consult current pesticide labels for required set back zones on filter strips or buffers.

### *Potential effects of converting CRP acres to crop production*

The Farm Service Agency (FSA) administers the Conservation Reserve Program and converting those lands to crop production prior to the contract expiration date is not allowed without terminating the contract. These terminations have costs associated with them, including repayment of annual payments already received, cost share payments, interest on those payments, and liquidated damages. Contact your local FSA office for more information.

## Natural Resource Impacts

Over the years, the conservation programs and practices Illinois' conservation farmers use to protect their land and demonstrate stewardship principles have provided significant natural resource benefits. Soil erosion, soil quality, water quality, and wildlife habitat have all been positively affected by the vegetation, grasses, prairies, trees and shrubs state and federal programs support and maintain. Transitioning these fields back into crop production will impact each of the following resource concerns. It is important to consider these impacts as you decide whether to re-engage idle acres back into agricultural production.

### *Soil Erosion*

Soil erosion rates will increase when sloping and Highly Erodible Land (HEL) fields are cropped compared to land maintained in sod. Erosion can be severe. Soil loss levels depend upon crops grown, tillage and crop residue left on the soil surface, as well as row direction. No-till provides the best erosion control in row crops. The use of cover crops and crop rotations that include hay should be considered. Check with your local NRCS/SWCD office for specific erosion estimates for different cropping systems. A good rule to follow: To prevent excessive erosion, leave at least 50' of sod strips every 200' on steep end rows where crop rows direct water to the end rows. Also, do not till through drainageways as these will erode severely.

### *Soil Quality*

Generally, soil quality will decrease with cropping compared to grasslands. Valuable soil quality benefits can be attributed to increases in organic matter and pore space for air and water movement and soil structure stability. Soil quality is the result of land protected and covered in grass vegetation. In order to maintain soil quality gains, select an appropriate tillage and management system. Research indicates no-till, cover crops, or a rotation with hay will best maintain soil quality improvements of idle land planted to row crop production.

### *Water Quality*

By returning land to crop production, land is exposed to increased erosion and chemical use and the potential for water quality problems is increased. Fields left idle or planted to prairie pastures have dramatically reduced soil erosion levels and reduced sedimentation of surface water.

Over the years, these areas reduced amounts of chemical fertilizer and pesticides that reach surface water. Tillage and management decisions directly impact potential surface water pollution. Using no-till or a rotation with hay that controls erosion can reduce sediment and chemicals attached to sediment that reach surface waters. Use of Integrated Pest Management is recommended to reduce need for pesticides.

Development of a nutrient management plan is recommended because it limits fertilizer application to no more than is needed for the crop and management system.

### *Wildlife Habitat*

Wildlife species who have made homes in grasslands, pastures, and marginal areas will be lost if land is cropped. Over the years, set aside acres provided habitat for many types of Illinois wildlife. Cropping this land reduces habitat available for wildlife food and cover.

Recommendations to reduce impacts on wildlife include use no-till/crops with hay in rotation, maintain seeding on contour buffer strips, end rows, maintain grass seedings on waterways, and leave strips of unharvested crop along the edge of fields for winter food and cover.

**Information Gathered by:**

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