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 Errotable 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/strips, filter strips, and severely eroded areas too steep or poor for crop production.
- Management methods.
- 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, small grains, 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. Experience in recent years indicates 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 that has been involved in USDA's Conservation Reserve Program (CRP) may meet some of the requirements of USDA's National Organic Program certification. Learn more about the certification process: 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 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.

Nitrogen
Because very little legume remains in most grasslands after 10 years, little, if any, nitrogen (N) credit can be taken. NRCS suggests following current University of Illinois guidelines 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.

Fertility
It’s crucial to know the 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 likely 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
Very high pH can cause herbicide injury 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 1/3 - 1/2 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.

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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 the tougher to control cool season grasses such as smooth bromegrass and
orchard grass. However, regional differences in grass control can be noted.

Cool season perennial 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 no later than boot stage
or early fall before the first killing frost, when
the perennial plant is storing food reserves and actively
growing.

For central and northern Illinois, a combination of
fall plus spring application is preferable over spring
only treatment. 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. Adding 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, trumpet creeper, 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 the 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
tillbugs may present a problem in corn planted
into sod. Wireworm bait stations should be used to
determine if corn seed protection is necessary.
Consult 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 labeled. 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. See 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 kernal
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 coapsis. See 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 were not suitable for crop production. They
may be areas that are 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 or 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. 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. 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 these soil quality gains, select an appropriate tillage and management system. Research indicates no-till 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, the 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 have reduced the amount of chemical fertilizer and pesticides that reach surface water. Tillage and management decisions directly impact the potential for 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. The use of Integrated Pest Management is recommended to reduce the 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 the 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.