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# Bringing Land in the Conservation Reserve Program Back Into Crop Production or Grazing

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**The purpose of this publication is to provide suggestions and recommendations on how to successfully crop or graze land that was previously in CRP. Because the objectives and resources of farmers vary considerably, this publication focuses more on guiding principles than on listing specific recommendations.**

The U.S. Department of Agriculture (USDA) established the Conservation Reserve Program (CRP) to promote the long-term retirement of environmentally sensitive cropland from production by paying farmers to establish a permanent, long-term vegetative cover.

When CRP land being brought into crop production is classified as highly erodible, it must be managed under an approved conservation program if the operator wants to remain eligible for most USDA benefit programs.

## General Policy

Check with your local Farm Service Agency (FSA) office about the current CRP regulations and requirements. Participants on certain CRP contracts may obtain permission to destroy vegetative cover during the final year of the contract. The purpose of the cover destruction is to prepare a seedbed for the next year's crop.

## Land Preparation

Participants with an approved request may destroy the vegetative cover mechanically or chemically (early land preparation has to be done after the primary nesting season) of the final contract year to prepare for seeding a crop.

## Continuous CRP

Participants may re-enroll portions of the expiring acreage under a continuous CRP sign-up practice. Wetlands and adjacent buffer areas, filter strips adjacent to streams and saline areas may be re-enrolled.

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## What factors should I consider when selecting a crop to follow CRP?

In addition to factors that are more economic in nature, such as crop price and equipment requirements, the following agronomic factors also should be considered when deciding on which crop would be the best fit after CRP. Most data would suggest that yields will be lower for all crops following CRP than is common for cropped lands grown in recommended rotations. This "yield drag" is associated with a number of factors, such as soil moisture levels, high carbon-nitrogen ratios that tie up nitrogen, pests and reduced soil temperatures associated with high levels of residues.

### Residue

Depending on the level of tillage used and the type of equipment available for planting, the heavy residues following CRP can be a challenge in establishing an adequate crop stand. Because most land following CRP is prone to erosion, retaining some residue is considered highly desirable.

Of the crops likely to be considered for establishment after CRP, corn is probably the most sensitive to cool soil temperatures that are associated with excessive crop residues because it normally is planted in early May. Although corn generally will establish best after some level of tillage to reduce the amount of residue shading the ground, tillage can reduce the amount of moisture in the soil, which may be needed for optimal crop growth in the drier regions of the state. An alternative if residue is removed through haying is the use of strip-tillage. Use the strip-till tool to make strips in the fall that will then be planted into in the spring using auto-steer. The less disturbance on these sensitive soils the better. CRP that has been tilled black can lose all of the organic matter it gained during CRP in a single windy afternoon.

Soybean, which is planted later in the spring, and cool-season crops, such as wheat and barley, are better able to handle the cooler soils when heavy residues are retained on the soil surface. Small-seeded crops may be difficult to establish under heavy residue situations if little or limited tillage is performed.

Haying the CRP ground can be a cost-effective way to remove excessive vegetation without destroying surface residues needed for erosion control. It also can encourage plant regrowth prior to chemical application, thus improving the effectiveness of the burn-down chemical.

However, haying is not permitted prior to the expiration of the CRP contract without a managed haying and grazing plan filed with the USDA.

With a managed haying and grazing plan, haying or grazing is permitted one out of three years and only after Aug. 1. Therefore, it must not have been hayed or grazed the previous two years. Haying or grazing also will result in a 25% reduction in the annual rental payment.

### Weed control

Perennial CRP grasses, quackgrass, broadleaf weeds and perennial woody plants must be killed for a successful transition from CRP to crop production. The best weed control is achieved when glyphosate is applied to actively growing plants with at least 6 inches of new growth in the fall and the spring prior to planting. Control from fall applications of glyphosate will be reduced greatly if the application is made under dry conditions when plants are hardened off and dormant from dry and hot weather.

Wheatgrasses and quackgrass can be killed by spring glyphosate at 0.75 pound of acid equivalent per acre (lb. ae/A). Bromegrass is the most difficult CRP grass to control and requires fall and spring application of glyphosate at 1.5 lb. ae/A.

Spring-planted grass crops, such as wheat and barley, will not compete with uncontrolled CRP grass stands, and lack of effective in-crop chemical control does not allow for control of volunteer grass. If small grains are planted no-till, farmers usually have insufficient time to apply glyphosate as a burn-down application in the spring before seeding.

Soybean and sunflower offer the longest period of time in the spring for an effective burn-down because of their later planting dates. These broadleaf crops also allow for postemergent grass herbicides to control volunteer CRP grasses. The later planting date of sunflower may allow for two spring preplant applications of herbicides. Nevertheless, competition from volunteer CRP plants may not make sunflowers the best crop for breaking out CRP.

Glyphosate applied in Roundup Ready corn, soybean, canola and sugarbeet will control in-season infestations of most all grass and broadleaf plants, regardless of how effective the weed control was in the fall and early spring. However, if glyphosate-resistant kochia or horseweed is present, glyphosate alone will not control these weeds.

Combining tillage with herbicides improves control of perennial species. Broadleaf control from glyphosate often is improved with 2,4-D or dicamba, but some reduction in grass control may occur.

### Soil water

In the fall, soils in CRP ground generally have very low levels of stored moisture because the established plants have been extracting water actively from the soil during the

growing season. Therefore, if rainfall has been minimal in the fall and limited snowmelt recharge took place before crop establishment, probably very little stored soil water is available in the surface two feet for use by crops. However, CRP is notorious in North Dakota for promoting salinity at its borders because the grass that grew on the CRP was inefficient in water use and excess subsoil water tended to flow at depths deeper than two feet, discharging into land adjacent to the CRP.

In the drier regions of the state where water likely will be a major limiting factor to crop production, avoid using crops such as corn and sunflower that have a high water requirement. Pea and barley are among the least water demanding, with wheat and soybean being intermediate in their water requirements. If water is adequate to excessive during the growing season, strongly consider a cover crop following a short-season crop to use some of the excess water prior to freeze-up.

## How can CRP lands be converted to land for grazing most effectively?

Conservation Reserve Program lands can be used effectively as grazing lands. However, several issues must be addressed before grazing can be initiated. These issues are similar for various types and classes of livestock (for example, cattle, bison, sheep or alternative species).

### Water

Water and fencing are probably the two biggest limitations for using CRP lands for grazing by any livestock species. Adequate water must be supplied to graze these lands. This can be supplied through dugouts, wells or pipelines. In some cases, the cost of water development can be quite high.

### Fencing

Many CRP lands are not fenced or fences are in a state of disrepair. Fencing options range from the use of simple single- or double-strand electric fences to four- or five-wire barbed fences.

A number of factors will influence the type of fencing you choose for these lands. Factors to consider include the size of the tract of land, species to be grazed, the season of use and whether the tract is owned or leased. In some cases, cost-share dollars may be available for a portion of the cost of perimeter fencing. In addition, temporary fencing and water sources may provide a short-term solution for residue removal via grazing.

### Previous Use

Lands that have had a history of haying or grazing likely will have less litter and standing dead material. This will increase the nutritive value of the grazed or hayed forage and improve livestock performance. Be sure to match nutrient requirements of livestock with feed supplied. A cow's protein and energy requirements increase from the third trimester of pregnancy and are greatest during the first 90 days of lactation. In some cases, the nutrient content of CRP forages is quite low and supplemental protein and/or energy sources must be provided.

### Renovating Pastures

Grasses in the CRP may be low in vigor due to the lack of nutrient cycling, low tiller development and excess litter buildup. Applying some nitrogen (N) at a rate of 40 to 60 lb./A of actual N will improve yield and quality.

Mowing, once permitted, also can improve vigor and pasture quality. Generally, cool-season grasses will dominate CRP land in the Northern Plains. Producers may need to provide for additional pastures or other sources of feed to augment these cool-season type pastures in late summer and early fall. The addition of legume species (for example, alfalfa) would increase the nutritive quality of CRP pasture mixes.

## What are the options for managing heavy residues following CRP?

Surface residue has value because it contains nutrients that eventually can be available to a crop and carbon for soil organic matter, catches snow that might otherwise blow off the field, moderates temperatures, helps reduce erosion and improves the infiltration rate of rainfall. However, too much surface residue makes planting difficult and keeps the soil cool in the spring. Residue management should focus on the balance of retaining sufficient cover to optimize the beneficial effects with the detrimental effects of too much residue.

On CRP fields with plant growth taller than 12 inches, cutting and removing plant materials may be necessary prior to planting or other tillage operations. Haying CRP prior to any management is one way to reduce residues and is recommended for no-till systems.

Although fire can be an effective means of removing excessive residues, it often is discouraged because it will result in N and S loss, as well as intermediately decomposed organic matter that would result in greater soil health, reducing issues with soil crusting, erosion, trafficability and fertilizer requirements. Ash following fire may be blown away, resulting in loss of minerals P and K, and further increasing the cost of subsequent crop inputs.

Burning also may result in significant wind/water erosion, degrading the soil.. Furthermore, fire bans frequently make burning residues unfeasible.

Volunteer tree growth larger than 1 inch in diameter also should be removed prior to planting or tillage. Smaller trees can be mowed, while larger trees that later will interfere with tillage or harvesting equipment may require cutting with a dozer blade.

Some form of tillage with or without haying can reduce surface residues significantly. If the soil can be made fit for planting with as little tillage as possible, the soil will remain protected from loss and retain any fertility that is gained during the CRP years.

At a scale of most harmful to least, moldboard plowing is the most effective method of incorporating residues, but it leaves the soil completely exposed to wind and water erosion and, therefore, is not recommended. Similarly, deep chiseling will blacken the soil, and generally will need disking with a heavy disc, such as the Wishek Disc to bury enough residue that the deep chiseling will not plug. A deep chiseling probably is tied with plowing for harmfulness, due to its habit of bringing up degraded subsoil, resulting in higher surface lime, increasing the risk of wind erosion and soil loss.

Disking with a heavy discs, such as a Wishek, may be preferred as a tillage tool because if set correctly, it may leave some residue at the surface to slow erosion. A field cultivator would be useless in CRP as a primary tillage tool. A vertical tillage tool may be effective if enough residue were removed through haying.

If tillage is chosen as a seeding prep option, fall tillage is preferred to spring tillage. Fall tillage may be impossible in some drier or wetter years, necessitating early spring tillage. Aerator rollers also can be effective in preparing CRP fields for crop production or grazing because they cut plant material into short enough lengths, allowing no-till planters to function effectively. The aerator roller sufficiently smooths the soil surface to allow effective tractor and machinery operation.

Some aerator rollers have blades mounted on the rollers to cut the standing or matted residue into 10-inch sections, which allows for direct seeding with single-disc, no-till planters; other models use 1-inch tubes or rollers to penetrate the soil. Aerator rollers level mounds created in CRP fields by rodents and other animals or other uneven field conditions. (See photo.)

Double-chisel plowing followed by disking or harrowing will prepare CRP fields effectively for seeders with hoe or disc openers. A single double-disc operation also is effective to smooth uneven field conditions and would be the only operation necessary to precede planting with no-till single-disc openers. These spring operations will significantly dry the soil, resulting in poor crop stands during dry springs.

When using row planters for corn or soybean, using row cleaners is necessary to move residue away from the planting disc. Failure to use these will result in planter plugging and hair-pinning of longer residue, interfering with placing seed at the appropriate depth and with subsequent germination and growth.

Strip tillage may be a viable option for fields when row crops will be planted subsequently. Strip tillage generally is performed in the fall and can reduce residues effectively in the tilled strip, thus improving early season stand establishment and vigor while leaving substantial residue between the rows to aid in soil conservations and rainfall infiltration.


**Aerator rollers can be used to cut residues into manageable lengths and flatten animal mounds prior to no-till planting.**

(Photo by John Nowatzki)

## What pests and weeds are likely to be problematic after CRP?

Wireworms and white grubs are the most common economic insect pests in cropland that was in CRP. These soil insects feed on the roots of crops and tunnel into seedlings, causing significant stand loss.

For wireworms, solar bait traps can be used three weeks prior to planting to detect populations that may cause economic losses. If more than one wireworm per trap is present, then a soil insecticide or insecticide seed treatment is warranted.

For white grubs, look for grubs in the upper 6 inches of soil during the late summer or fall before a freeze. The current economic threshold for white grubs is one larva per square foot in North Dakota.

Skunks and moles often cause secondary damage to grub-infested crops by digging for grubs just below the soil surface. The presence of mole tunnels or skunk diggings are symptoms of a white grub problem in the field.

Other occasional insect pests of land coming out of CRP include cutworms, seed corn maggots and grasshoppers.

Cutworms should be scouted routinely when crops are in the seedling to the early vegetative stages for signs of cut or wilted plants. Follow the pest management and economic threshold recommendations in the current NDSU Extension publication E1143 "North Dakota Field Crop Insect Management Guide" (http://tinyurl.com/NDSUInsectGuide).

Adult seed corn maggots are attracted to fields with green manure or decaying organic matter for egg laying. Maggots feed on the germinating seeds and seedlings. When CRP cover is burned down in the spring and cultivated, the freshly decaying organic matter is attractive to adult flies and more likely to cause a stand loss problem. In contrast, CRP cover that is burned down chemically in the fall is less likely to have problems from seed corn maggots.

Grasshoppers can be a pest problem when populations exceed eight to 14 adults or 30 to 45 nymphs per square yard in the field and weather conditions are favorable (hot, dry) for grasshopper development. If grasshoppers are present at high densities early in the spring, the immature (nymph) stages are easier to control than adults, and nymphs usually still are within hatching sites (CRP, roadsides or fence rows).

Treating immature grasshoppers early has some advantages: (1) fewer acres will have to be treated and a lower rate of insecticide is necessary for effective control; (2) grasshoppers are killed before they have had the opportunity to cause significant crop loss; (3) smaller grasshoppers are more susceptible to pesticides than larger grasshoppers; and (4) early treatment before grasshoppers reach maturity prevents egg deposition, which may help reduce the potential grasshopper threat for the following crop year.

Broad-spectrum insecticides have been approved for control of these insect pests. Refer to the NDSU Extension current "North Dakota Field Crop Insect Management Guide" for a current list of approved insecticides by crop.

Banding insecticides are easier to apply with corn-planting equipment than with a drill when planting soybean or small grains. Commercially applied seed treatments, such as Gaucho, Cruiser or Poncho, are effective in controlling wireworms and seed corn maggots but provide only suppression of white grubs and cutworms. The high rate of seed treatment is recommended when insect pressure is high.

Weeds that will be most problematic are perennial grasses and broadleaf perennial weeds, such as Canada thistle.

Cultivation alone will not give satisfactory control of CRP vegetation. A herbicide treatment applied several weeks prior to tillage will reduce the amount of vegetation. Fall-applied herbicides are needed if conventional tillage methods will be used to prepare a seedbed the following year. Fall application allows the breakdown of foliage and root plant biomass.

Application needs to take place on actively growing green plant tissue. Prior removal of excess plant biomass will stimulate green tissue development. Cultivators and some tillage equipment tend to plug during spring tillage when a fall-applied herbicide is not used.

Mechanical and cultural vegetation control methods should be followed by a vigorous weed control program the following spring.

CRP grasses and forbs may become a problem in the planted crop. Seeding a broadleaf crop after CRP breakout will provide chemical control options not available in grass crops. For herbicides to be used in killing weeds in CRP or the following crops, see the "North Dakota Weed Control Guide" (http://tinyurl.com/NDSUWeedGuide).

NDSU research found that glyphosate at 0.75 lb. ae/A applied in the fall or spring gave less than 70% alfalfa and smooth bromegrass control. Glyphosate at 1.5 lb. ae/A applied in the fall gave 98% early season alfalfa and smooth brome control, but regrowth occurred by midsummer. A fall application followed by a spring application of

glyphosate each at 0.75 lb. ae/A or a spring application of glyphosate at 1.5 lb. ae/A was required for greater than 90% control of smooth brome.

A spring application of glyphosate at 1.5 lb. ae/A also provided more than 90% alfalfa and smooth brome control. Tillage improved control of perennial regrowth (15-20% increase) from fall applications of glyphosate, but it did not improve control from spring applications.

## What soil fertility management practices need special attention?

Establish a soil fertility program that starts with thorough soil testing. Nitrogen usually is very low after CRP, and with residue with a high carbon-to-nitrogen ratio, additional N will be tied up early in the growing season. Each ton per acre of estimated residue will result in 20 pounds N per acre tie-up. Using the N calculator for corn for example, increasing the N recommended by 30 pounds per acre would not be unreasonable.

Phosphorus (P) and potassium (K) soil tests will be similar after CRP than when the field was put into CRP. Follow soil test P and K recommendations for the subsequent crop. Soil test after the subsequent crop to identify any contributions from residue decomposition that might be available to the crop two years out of CRP. Small grains, corn and canola will all benefit from starter P application particularly following CRP. Soybean, other annual legumes (except perhaps dry bean) and sunflower will not benefit from a starter P application (sunflower will not benefit from any application of P).

If the subsequent crop is a row crop using strip-till, N as anhydrous ammonia or urea may be applied into the strip the previous fall if the application is made late in the fall using standard timing precautions. In the spring, use of anhydrous ammonia in a strip-till strip may be an issue to germination if the band is too close to the seed or the soil is loose enough to allow gas to reach the seed. Urea or UAN placed at least 2 inches from the seed would be a safer option. Urea can be placed on the soil surface if the urea is protected with a labeled rate of NBPT urease inhibitor. UAN loss can be very high if broadcast onto residue, so applying it in a surface band with NBPT with be a much wiser choice of application. Sidedress with ammonia/UAN/urea also is an option if a coulter is employed with the ammonia/UAN, and urea is applied with NBPT.

If a legume crop such as field pea or soybean is grown, a seed inoculant with a crop-specific Rhizobia is needed. Granular inoculants have been most consistent in providing successful inoculation for growers of first-year legumes, but if the grower is experienced in the proper seed treatment with liquid or dry peat formulations, any properly inoculated seed will perform adequately. Double-inoculation is the most dependable method of Rhizobia inoculation. This means, perhaps applying a peat-based product to the seed and granular inoculant through the planter. Disasters can be averted by calibrating the inoculant delivery prior to the day of seeding.

## What are the ways to deal with gopher mounds?

Gopher mounds and holes from other burrowing mammals can be a significant constraint to the planting process and can interfere with harvesting crops that require the header be placed close to the ground. Scout the land to determine if mounds will be an important issue.

Tillage can flatten mounds and help level the soil surface, and it certainly is one of the benefits to consider when deciding whether to use tillage. Special equipment that flattens mounds with little or no tillage (such as the roller pictured above) has been developed for no-till systems and may be available on a custom basis in parts of the state.

If rocks are a problem, fields can be rolled with water-filled rollers after seeding certain crops.

## Can CRP land be converted to organic production?

Producers who have not used any synthetic fertilizer or herbicides for at least three years may consider converting CRP acres into organic crop production or for grazing in organic animal production. The acres need to be certified to obtain organic status.

The organic certification process takes time, and producers should plan to start a minimum of one year in advance of planned use to ensure that proper certification requirements can be met. Producers need to work with organic certifying agencies well in advance of the expiration of the CRP contract to ensure that all of the requirements for certification can be met. For additional information on organic certification, contact an organic certification agency.

For organic crop production systems, grasses and other weedy plants that were established during CRP must be dead before planting a crop. Plowing in the fall, preferably with a moldboard plow, will be essential.

Although planting a cover crop such as rye on fall-plowed land is recommended to reduce soil erosion losses, this may not be feasible in most of the state because of cold temperatures after late fall planting. Additional tillage in the spring after the first flush of weeds has emerged will reduce weed pressure further and help control perennial weeds.

## What are the costs of returning CRP to annual crop production?

Returning CRP to annual production will involve some combination of tillage and chemical application. Numerous combinations will work.

**Table 1** includes costs of performing several primary and secondary tillage operations, as well as ground and aerial spraying. The custom charges are based on the latest NDSU Extension custom farm work survey completed in 2020. Total costs and use-related costs are from the "Machinery Cost Estimates" publication from University of Minnesota Extension.

Many owners of CRP land are retired and will need to hire someone to do the work. Custom rates represent a good estimate of cost to use. Custom rates include the machine, power unit, fuel, repairs and labor.

If you are hiring machine work, custom rate charges are the appropriate cost. If you own the needed equipment and do the work yourself, total cost or use-related cost is appropriate.

Total cost includes all costs, including overhead. Use-related costs are those incurred only when a machine is used. These include fuel, lubrication, use-related repairs, labor and depreciation. Use-related costs are used more commonly.

**Table 2** includes estimated chemical costs. Chemical costs will vary depending on the choice of product, rate applied and changing market prices.

**Table 3** is an example budget of costs to convert CRP land into ready-to-plant acreage. This example includes one ground spraying operation with a tank mix of glyphosate and 2,4-D, two heavy disking operations and one pass with a field cultivator, all based on custom rate charges. Also included is a charge for soil testing.

**Table 1. Returning CRP to Production Field Operation Costs ($ per acre).**

| | Custom Charge | Total Cost | Use-related Cost |
|---|---|---|---|
| Moldboard plow | $10.50 | $27.99 | $22.29 |
| Heavy disk | $11.12 | $18.20 | $14.17 |
| Chisel plow | $11.30 | $14.76 | $10.82 |
| Disk/chisel | $13.09 | $18.69 | $13.92 |
| Field cultivator | $ 9.27 | $ 6.88 | $ 5.17 |
| Tandem disk | $12.83 | $14.97 | $11.35 |
| Heavy harrow | $ 7.38 | — | — |
| Ground sprayer | $ 7.32 | $ 6.45 | $ 4.15 |
| Aerial sprayer | $ 8.00 | — | — |

**Table 2. Chemical Costs ($ per acre).**

| Chemical | Cost[1] |
|---|---|
| Glyphosate – 2 quarts | $10.05 |
| 2,4-D | $ 5.00 |

[1]Cost estimate prior to COVID, current prices may be higher.

**Table 3. Example Budget ($ per acre).**

| | Custom Rate |
|---|---|
| Ground spray (1 pass) | $7.32 |
| Glyphosate plus 2,4-D | $15.05 |
| Heavy disk (2 passes) | $22.24 |
| Field cultivator (1 pass) | $9.27 |
| Soil test | $1.00 |
| TOTAL | $54.88 |

The above example suggests a cost of $54.88 per acre to prepare CRP acreage for planting.

This cost should be the responsibility of the landowner because the landowner has received the income from the previous crop (CRP rental payments). This would be consistent with the common practice of the current operator preparing the field for the next crop after harvesting the current crop.

# Which crop to grow after CRP?

## Corn

### Pros:

- High yield potential
- Insecticide options are excellent
- Gopher mounds not problematic
- Large seeded
- Many herbicide options, including RR

### Cons:

- Heavy residue can slow emergence
- Time is limited for spring burn-down
- Wireworms, white grubs and cutworms can be problematic
- Fertilizer requirements are high

## Soybean

### Pros:

Late planting date allows more time for spring chemical burn-down

- Allows soil warmup
- Weedy grasses easily controlled. More broadleaf control options if using Xtend or Enlist soybean
- Fixes N
- Grasses are not a host to soybean diseases

### Cons:

- Prefers pH between 5.5 and 6.9, with low soluble salts (<1mmohs/cm or < 1dS/m)
- Certain broadleaf weeds can be problematic. More-so if varieties other than Xtend or Enlist are planted
- Gopher mounds affect harvesting

## Small grain

### Pros:

- Winter wheat allows for earlier breakout
- Less affected by cool soils associated with residue

### Cons:

- Requires multiple burn-down herbicides for total grass control
- Grass control within crop can be expensive and difficult
- Certain grass diseases infect small grains
- Needs early planting in the spring
- Fertilizer requirements are high

## Sunflower

### Pros:

- Later planting
- Allows time for spring weed control
- Not susceptible to grass diseases
- Deep rooted

### Cons:

- Soil insects may be problematic
- Perennial broadleaf weeds may be problematic
- Fertilizer N required

## Field Pea

### Pros:

- Handles cool soil temperatures
- Fixes N
- Low water user
- Large seed that can be planted relatively deeply

### Cons:

- Limited time for spring burn-down
- Seed cost is high
- Needs early planting to perform well
- Limited broadleaf weed control options in-crop

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