Fact Sheet SARE project LS 94-58

PRODUCTION TECHNOLOGY

Department of Agronomy
Division of Agricultural Science & Natural Resources
Oklahoma State University

OSU
OKLAHOMA COOPERATIVE EXTENSION SERVICE

PT97-21 **April 1997** **Vol. 9, No. 21**

CONVERTING CRP LAND TO CROP PRODUCTION: WINTER WHEAT

James H. Stiegler
Extension Soil Management Specialist

Thanh Dao
Soil Scientist USDA-ARS - Bushland,Texas

Overview

Holders of Conservation Reserve Program (CRP) contracts will have to choose the future use of this land in 1997. Many of these acres will eventually be converted back to cropland because either they will not be accepted into CRP-2, or producers prefer crop over forage and livestock production. Once the decision has been made to convert CRP land to crop production, consideration must be given as to how this can best be accomplished to maximize short- and long-term return to the land resource.

The majority of crops grown on post-CRP land will be dryland farmed. So the most limiting factor to producing an initial crop will be soil moisture. After 10 years in grass and being unable to destroy the sod until after July 1, most fields could be extremely dry immediately following the expiration of the CRP contract on September 30. It may be necessary to fallow for one season before a successful crop can be grown on post-CRP land.

The second limiting factor will be a lack of plant nutrients. While 10 years in grass improved soil aggregation and added some organic matter to the surface, most fields are particularly deficient in nitrogen and phosphorus. Most of the nitrogen can be added after the crop has emerged, but some should be added before any tillage to enhance residue decomposition. A phosphorus fertilizer application should also be considered when the land is being prepared for crop production.

Plan Ahead

All crop land receiving transition payments must meet NRCS conservation compliance regulations. Evaluate the land for its suitability for cropping and determine what conservation practices will be needed before you destroy the grass. Some areas such as waterways, riparian areas near streams and reservoirs, areas immediately around playa lakes, and extremely erodible land will be best left in grass. These areas can potentially be used for haying, grazing or wildlife habitat. The type of weeds, especially perennial weeds that are

present may require a crop rotation that allows chemical and cultural control of such weeds and dictate the role tillage. Regardless of the crop that will be planted, or the tillage system selected, the old grass growth must be removed and the grass should be controlled as soon as possible to conserve soil profile moisture and to allow time for some of the residue to decompose. Remember that these HEL acres were marginal cropland and probably never did produce high yields. Don't expect high crop yields from these acres after they come out of grass.

Tillage Options

The type of tillage operations to use for converting CRP land to crop production will be a major consideration. The tillage options include (1) no-tillage, (2) reduced tillage, and (3) clean tillage.

No-Tillage. The disadvantages are a total reliance upon herbicides. The advantages are that it maximizes soil quality benefits from 10 years of being in continuous grass. These benefits include increased organic matter content and aggregation which in turn increases soil water holding capacity, improves water infiltration, increases potential mineralization of nitrogen, and reduces water runoff and soil erosion. The disadvantages are a total reliance on herbicides to effectively terminate CRP grass and to control weeds, and volunteer grass in the subsequent crops. It will require using no-till equipment or the modification of existing equipment to successfully plant into the CRP grass residue. This will largely dependent on soil conditions, density of the grass sod, and the residue present at planting.

Reduced-tillage. Reduced-tillage systems will likely involve a combination of herbicides and tillage operations using sweeps, chisels, disks, or field cultivators with the goal of leaving significant residue on the soil surface. Its advantage is that at least some of the benefits of no-tillage are retained while the likelihood of having to purchase additional equipment is significantly reduced. In Oklahoma studies, the large V-blade sweep has been effective in killing the sod, and loosening the soil on sandy or loamy soils. Either no-till planting equipment or secondary tillage are needed to seed sweep tilled fields. Disking may be a better tillage alternative if soils are heavy textured but disking produces a very rough, cloddy surface that requires multiple diskings and other secondary tillage. Amounts of residues and surface cover are further reduced..

Clean-tillage. Clean-tillage systems will involve the use of a offset disk, one-way or a moldboard plow. Little residue will remain on the soil surface to control erosion, reduce runoff or reduce water evaporation. However, the mix of residue and well aggregated soil will resist erosion throughout the first crop year. If clean tillage is used, a good residue management cropping system should be developed. The advantage of this system is the grass can be completely controlled soon after expiration of the CRP contract and needed fertilizer can be incorporated. The disadvantage is that several additional tillage operations will be needed to prepare the land for planting. Loss of residue, organic matter and soil aggregation is accelerated. Water evaporation is increased. Problem perennial weeds such as bindweed is intensified.

Conversion to Wheat

As stated earlier, producing a winter wheat crop the year the CRP contract expires will be exceptionally difficult due to the dry soil profile following the grass and an insufficient

fallow time to replenish soil moisture prior to wheat planting. A no-tillage system may have the best potential for success since soil moisture storage will be optimized during the short fallow period. Although it is highly desirable to conserve as much of the fixed carbon in the surface mulch, in most cases, there is too much residue to effectively plant wheat no-till and get acceptable stands and crop yields unless the mulch is removed.

A controlled burn is an inexpensive and effective way to remove the old grass growth. Mowing and baling is another option, but it is more costly and the hay is poor quality and of little value. Simply mowing the grass may do more harm than good since the resulting loose residue will interfere with grass regrowth, herbicide application and planting. The old growth should be removed in May or early June. Removal of old grass residue will stimulate new grass growth, improve herbicide performance, and improve the planting operation. A no-tillage drill will be required to seed into the grass sod.

The most effective herbicide to kill the grass under most conditions will be Roundup Ultra. Roundup Ultra works best when the grass is 6 - 10 inches tall and actively growing. A minimum of 2 qts/acre of Roundup Ultra applied in 5-10 gallons of water with ammonium sulfate is needed for control. The application should be made as soon after July 1 as possible unless the grass is moisture stressed. Lower rates applied earlier have not been very effective. The data in Table 1 shows the effectiveness of various application rates and dates of Roundup at two study locations in Oklahoma when the old grass growth was not removed. This residue intercepts and interferes with Roundup activity.

Table 1 . Percent control of Old World Bluestem in CRP fields four weeks after application.

Roundup Rate	DUKE, OK Application Date		FORGAN, OK Application Date	
lbs/acre	June	July	May	July
	percent			
0.25	33	10	12	37
0.50	59	39	13	47
1.0	73	69	13	87
1.5	61	83	13	93
	$LSD_{.05}$	13	$LSD_{.05}$	9

If no-tillage is not an option, consider sweep tilling the grass once followed by disking as necessary for grass and weed control. This approach will provide a better seedbed condition than planting directly into the sod but will probably not conserve as much moisture. If a reasonable grass kill and seedbed is achieved with the sweep, an alternative to any disking would be the application of any one of several sulfonylurea herbicides. Moldboard plowing is an excellent way to bury old grass growth and kill the plants if pre-treatment is not done. If tillage is used for initial grass control, a fall application of one quart per acre of Roundup Ultra or Landmaster BW before planting might be needed to control regrowth of most grasses and aid in bindweed control. Be sure to comply with label requirements.

Plant wheat as soon as possible after September 30, especially if reasonable surface moisture is present. Apply 100 lbs of 18-46-0 in the seed furrow at planting. Sixty pounds of nitrogen should be topdressed anytime after emergence and up to the first of March if moisture conditions are favorable for producing a crop. If moisture is inadequate for stand establishment, consider leaving the land fallow or plant a summer crop in the spring.

Field studies have been conducted on two CRP fields under contract since 1987 to identify dryland wheat production systems for converting the CRP, Old World bluestem to annual wheat production. One site is at Forgan, OK on a Dalhart fine sandy loam, 1-3% soil and an 18" annual rainfall. The other site is at Duke, OK on a LaCasa-Weymouth clay loam, 1-3% soil an 29" annual rainfall. The wheat yield data from these studies are presented in Table 2. Additional small plot data showing the effect of tillage and fertilizer on wheat yields are shown in Table 3.

Table 2. Dryland wheat yields on former CRP lands.

Location	Year	Tillage System[1]	First year	Second-year
			----------(bu/acre)----------	
Forgan	1994	ST	13b	
		NT	17a	
	1995[2]	ST	12a	3a
		NT	4b	2a
Duke	1994	DT	24a	
		NT	26a	
	1995[2]	DT	7b	6b
		NT	14a	14a

[1] ST = sweep tillage; DT = disk tillage; NT = no-till

Table 3. Effect of tillage and fertilizer on wheat yields (small plots)[1].

Fertilizer	No-till	Moldboard plow	Disk	Mean
		bu/acre		
		Forgan, OK		
0	1	10	6	5.7a
100 lbs N/ac	14	26	24	21.3b
100 lbsN/ac + 50 P_2O_5	15	28	25	22.7b
		Duke, OK		
0	8	20	14	14.0a
100 lbs N/ac	22	30	28	26.7b
100 lbsN/ac + 50 P_2O_5	26	32	29	29.0b

[1]No removal of the old OWB growth before tillage or spraying.

Assistance for Producers

Specialists in the Oklahoma Agricultural Extension Service in addition to technicians and conservationists with the Natural Resources Conservation Service can provide valuable assistance to producers. The information in this bulletin is very general and producers should seek recommendations for their specific region and production system.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1913, in cooperation with the US Department of Agriculture, Sam E. Curl, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Dean of the Division of Agricultural Sciences and Natural Resources