AGRICULTURAL EXPERIMENT STATION

NEW MEXICO STATE UNIVERSITY

COOPERATIVE EXTENSION SERVICE

CROP AND LIVESTOCK PRODUCTION SYSTEMS FOR LAND IN THE CONSERVATION RESERVE PROGRAM[1]

1994 Progress Report

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Introduction

Since 1985, nearly one-half million acres of New Mexico cropland have been converted to perennial grasslands through the Conservation Reserve Program (CRP) (Table 1). CRP land comprises 29% of the cropland acreage in Curry, Harding, Lea, Quay, Roosevelt, and Union counties in eastern New Mexico.

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The first lands enrolled in CRP will be eligible to revert to productive use after September 30, 1995. Ninety-two percent of the CRP land in eastern New Mexico will be released from its initial 10-year CRP contract by October, 1996. As CRP contracts end, producers must sort through a myriad of potential land use and government program options. In anticipation of this decision, a project to evaluate several post-CRP land use alternatives was initiated in 1994. Personnel from New Mexico State University, USDA Natural Resource Conservation Service, and private landholders are collaborating on this research/demonstration project.

Table 1. New Mexico 1995 CRP Report

County	No. of Contracts	Total CRP Acres
Curry	445	153,832
Harding	79	17,008
Lea	145	37,059
Quay	241	84,385
Roosevelt	396	125,832
Union	134	30,284
All other counties[a]	157	31,831
State total	1597	480,229

[a]Includes Chaves, Cibola, Colfax, De Baca, Dona Ana, Hidalgo, Luna, Mora, Rio Arriba, San Juan, Santa Fe, Taos, and Torrance.
Source: New Mexico ASCS FY 1995 CRP Report

The project includes evaluations to:

1. Determine the seasonal productivity of grasses growing on CRP land.

2. Determine the seasonal acceptability and utilization of weeping lovegrass by grazing livestock.

3. Identify dryland crop production systems for converting CRP grassland to annual crop production.

4. Demonstrate techniques for enhancing wildlife habitat on CRP and post-CRP land.

5. Evaluate the potential profitability of alternative production systems and farm program options.

Readers should be aware that results reported herein are based on a single year of field trials. Data have not been statistically analyzed. Caution should be exercised when drawing conclusions from this limited information. However, the project cooperators believe that limited amounts of information can be very useful for producers who have begun thinking about

alternatives at the end of the CRP. As additional information from this project becomes available, more definitive conclusions can be drawn.

Seasonal Productivity of CRP Grasslands

Eleven tracts of privately owned CRP land at various locations throughout eastern New Mexico were selected to determine seasonal production and nutritive value. Grass species sampled and their site locations are shown in Table 2.

Table 2. CRP Grass Sampling Sites, 1994.

Grass Species	Location	County	Soil Type	Est. Rainfall
Blue & Sideoats Grama	Mosquero	Harding	Labrier loam	8.3 in.
Blue Grama	Grady	Curry	Pullman loam	n/a
Weeping Lovegrass	San Jon	Quay	Amarillo loamy fine sand	16.3 in.
Weeping Lovegrass	Portales	Roosevelt	Amarillo loamy fine sand	9.9 in.
Weeping Lovegrass	Crossroads	Lea	Brownfield-Patricia fine sand	6.0 in.
Weeping Lovegrass	Clovis	Curry	Pullman & Mansker loam	11.7 in.
Yellow Bluestem	San Jon	Quay	Amarillo fine sandy loam	16.3 in.
Yellow Bluestem	Clayton	Union	Rickmore sandy loam	18.4 in.
Kleingrass	McDonald	Lea	Lea loam	9.8 in.
Mixed species (1)	Sedan	Union	Rickmore sandy loam	13.8 in.
Mixed species (2)	Sedan	Union	Rickmore sandy loam	13.8 in.

Mixed species (1) = Sand lovegrass, indiangrass, switchgrass, big bluestem and blue grama.
Mixed species (2) = Side oats grama, blue grama, sand bluestem, and indiangrass.

Each site was sampled on two dates in 1994 to determine forage production and nutritive quality. Forage production was determined by harvesting all non-dormant aerial plant material within multiple replications of paired 5.6 square foot areas. Forage production data by grass species are presented Figures 1-7. One weeping lovegrass site and two yellow bluestem

sites were burned before the beginning of the growing season to compare rates of forage regrowth (figs. 5 & 6). In addition, one weeping lovegrass site received a June 3 application of nitrogen fertilizer (fig. 7). The 1X and 2X rates of fertilizer represent 34 and 68 lb. of nitrogen per acre, respectively.

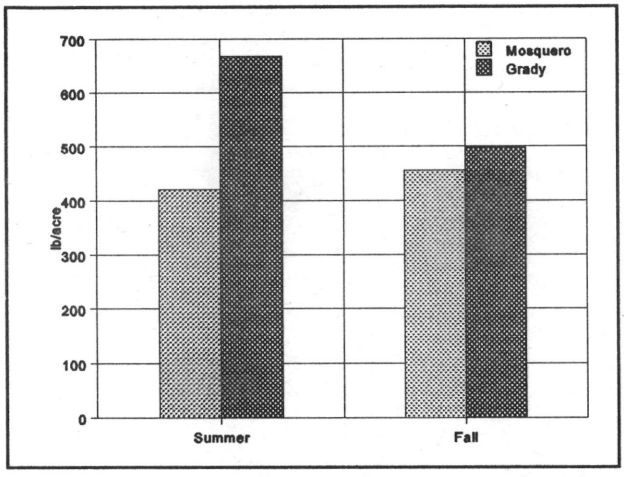

Figure 1. Grama grass forage production at Mosquero and Grady, 1994.

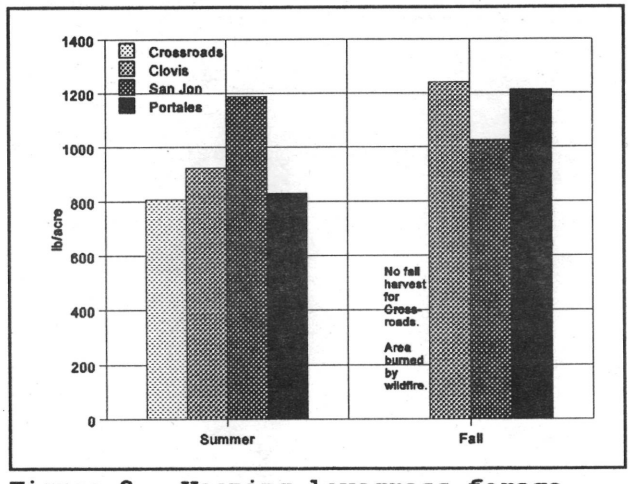

Figure 2. Weeping lovegrass forage production at Crossroads, Clovis, San Jon and Portales, 1994.

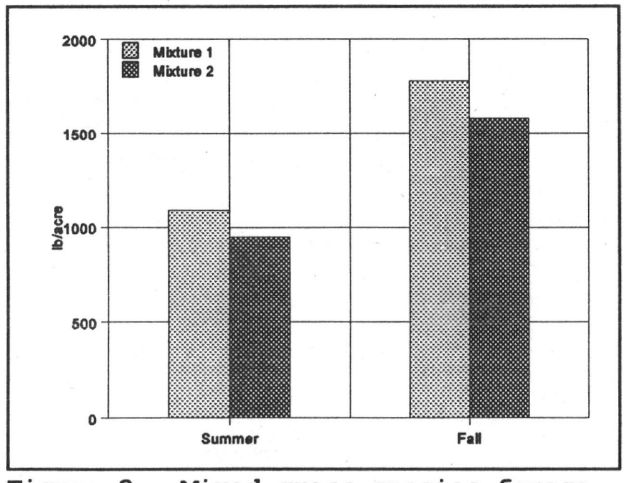

Figure 3. Mixed grass species forage production at Sedan, 1994.

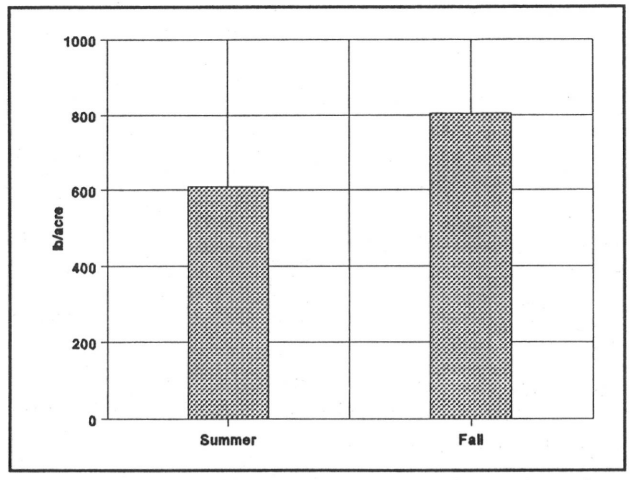

Figure 4. Kleingrass forage production at McDonald, 1994.

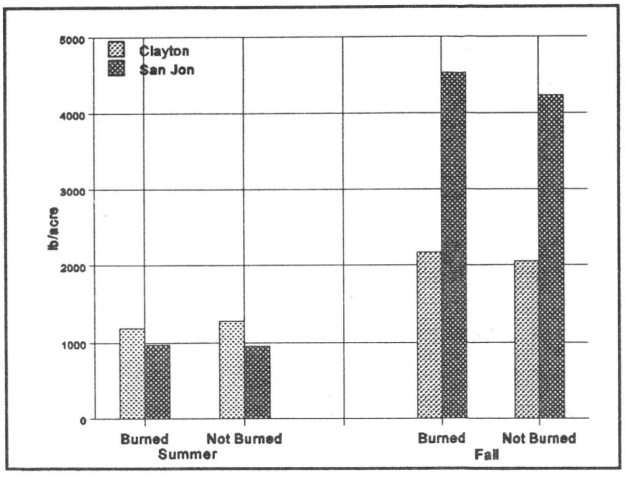

Figure 5. Bluestem forage production from burned and non-burned sites at San Jon and Clayton, 1994.

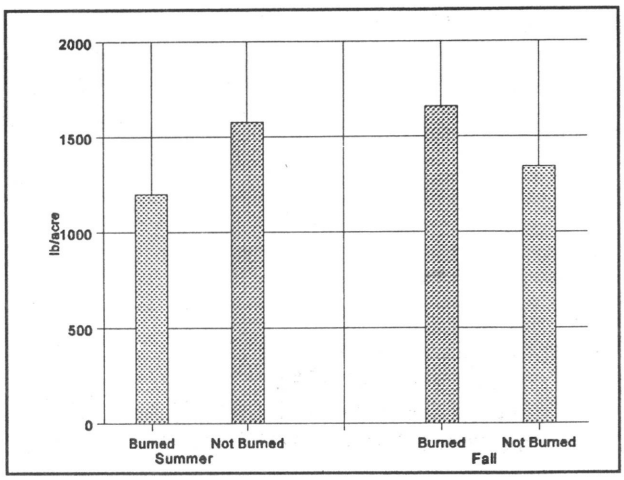

Figure 6. Weeping lovegrass forage production from burned and non-burned sites at Clovis, 1994.

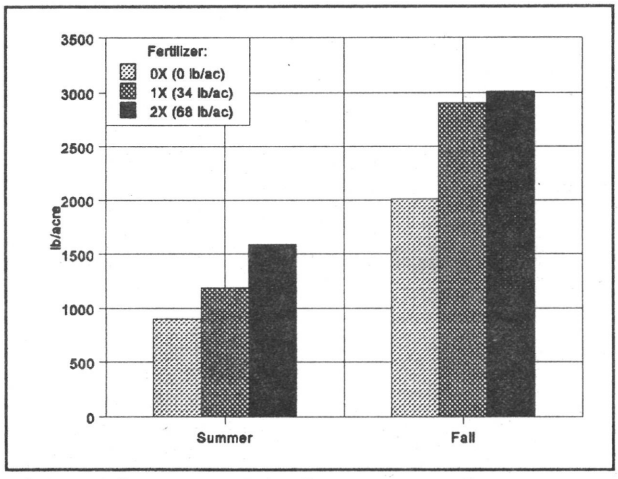

Figure 7. Weeping lovegrass forage production from fertilized sites at Clovis, 1994.

Preliminary forage yield data show there were dramatic locational differences throughout the six-county study area. Old world bluestem tended to produce more forage than the other species. Blue grama tended to produce the least forage, although its nutritive quality is expected to be higher than most other grasses. Burning pre-treatment tended to reduce early-season forage yield, but appeared to increase late-season yields. Positive responses to applications of nitrogen fertilizer were observed in weeping lovegrass. Nutritive analysis of the samples collected in 1994 will be completed in spring 1995.

CRP Weeping Lovegrass Grazing Trial

In spring 1994, a 1204-acre tract of weeping lovegrass (unknown cultivar) was selected for use as a grazing trial. The tract, owned by Wayne Palla, has been in the CRP since 1987. Mr. Palla is receiving no monetary compensation for allowing grazing use on this land. The trial is located approximately 15 miles north of Clovis in Pullman and Mansker loam soils. Annual precipitation during the 1994 growing season was approximately 11.7".

On April 13, 1994, the entire tract was burned. A 360-acre portion of the tract was selected for use as the grazing trial. This area was developed with a livestock watering system and cross-fenced with hi-tensile electric fencing. The grazing trial consists of two replications of the five grazing treatments (Table 3).

Table 3. CRP Grazing Treatments, 1994.

Grazing Treatment	Dates Grazed	Approximate Stocking Rate
12 mo. Continuous Grazing	6/15/94-to date	6.0 ac/head
6 mo. Continuous Grazing	6/15/94-11/29/94	3.0 ac/head
Heavy Spring/Fall Grazing	6/15/94-7/27/94 9/07/94-11/29/94	1.5 ac/head 2.7 ac/head
Heavy Spring/Fall Grazing with Fertilizer	6/15/94-7/27/94 9/07/94-11/29/94	1.5 ac/head 2.3 ac/head
6-Pasture Rotation Grazing	6/15/94-11/29/94	3.0 ac/head

The fertilized pastures received a urea fertilizer application on June 3, 1994 at the rate of 34 lb. of nitrogen per acre. The rotation pastures were subdivided into six paddocks containing 5 acres each. Heifers were confined to a single paddock for 21 days, then rotated to the next paddock. After all paddocks had been grazed (October 19), the cattle were provided access to the entire 30-acre pasture.

Pastures were initially stocked with yearling crossbred heifers (average body weight 502 lb.) on June 15, 1994. Weights were recorded at 21-day intervals until November 29. After that date, weights were recorded at 42-day intervals.

While on the grazing trial, all cattle were provided free access to white salt and 12:12 mineral block. From November 9 to November 29 all cattle received a 37% protein block supplement at a rate of 1.1 lb. per head per day. All cattle, except those on the 12-month continuous grazing pastures, were removed from the grazing trial on November 29. The remaining cattle received the same protein supplement at a rate of 1.9 lb. per head per day.

Rates of gain for cattle grazing the various pastures are shown in Figure 8. During the first three-week grazing period, average per-head daily gains were near 3 lb. Weight gains declined as the grazing season progressed and the forage matured. During periods when heifers in the rotation pastures were confined to individual paddocks, their gains were lower than the gains from their counterparts on non-rotationally grazed pastures. From October 19 to November 29, the heifers in the rotation pastures were allowed free access to the entire 30-acre pasture. During this time, their rates of gain were higher than most of the other treatment groups. It should be noted that after November 9, all treatment groups lost weight although they were receiving supplemental protein.

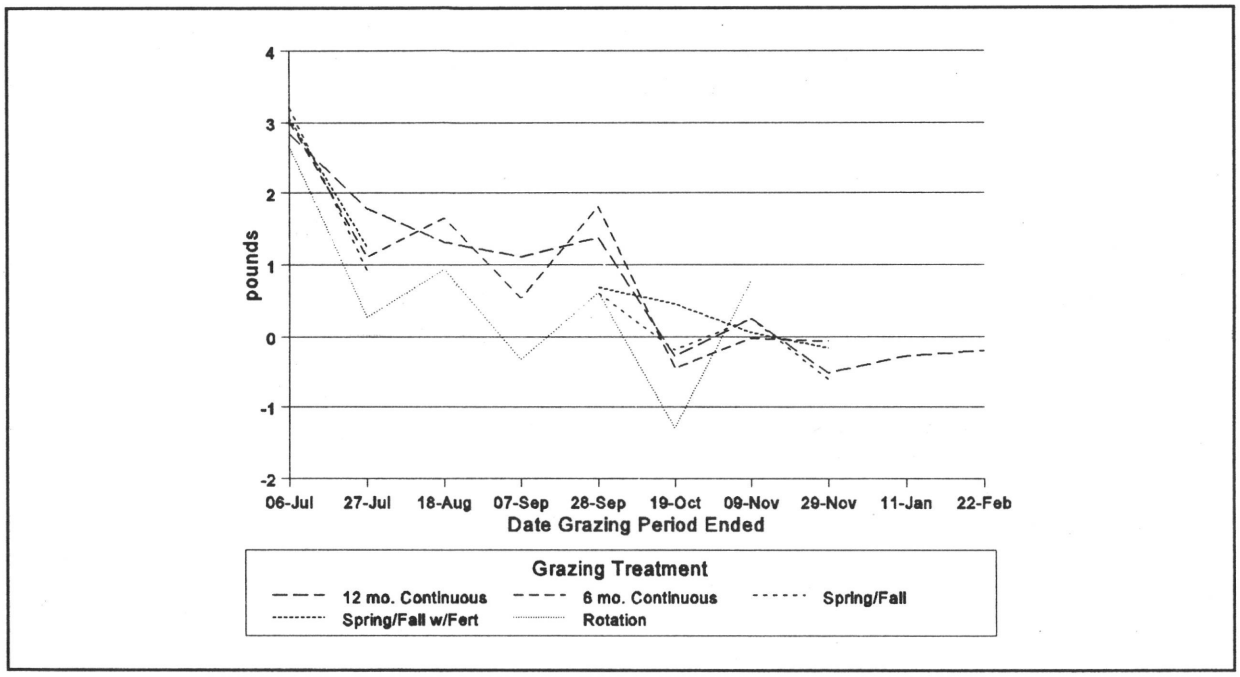

Figure 8. Average daily gains of heifers grazing weeping lovegrass at Clovis, 1994.

Information on weight gain per acre is presented in Figure 9. The two spring/fall grazed pastures produced more gain per acre than the other pastures. Beginning with the September 28 weigh period, a positive response to the application of nitrogen fertilizer was observed. The rotationally grazed pasture and the 12-month grazed pasture produced less than one-half the per-acre weight gain of the spring/fall grazed pastures. After November 9, all pastures produced negative gains due to the weight losses of grazing cattle.

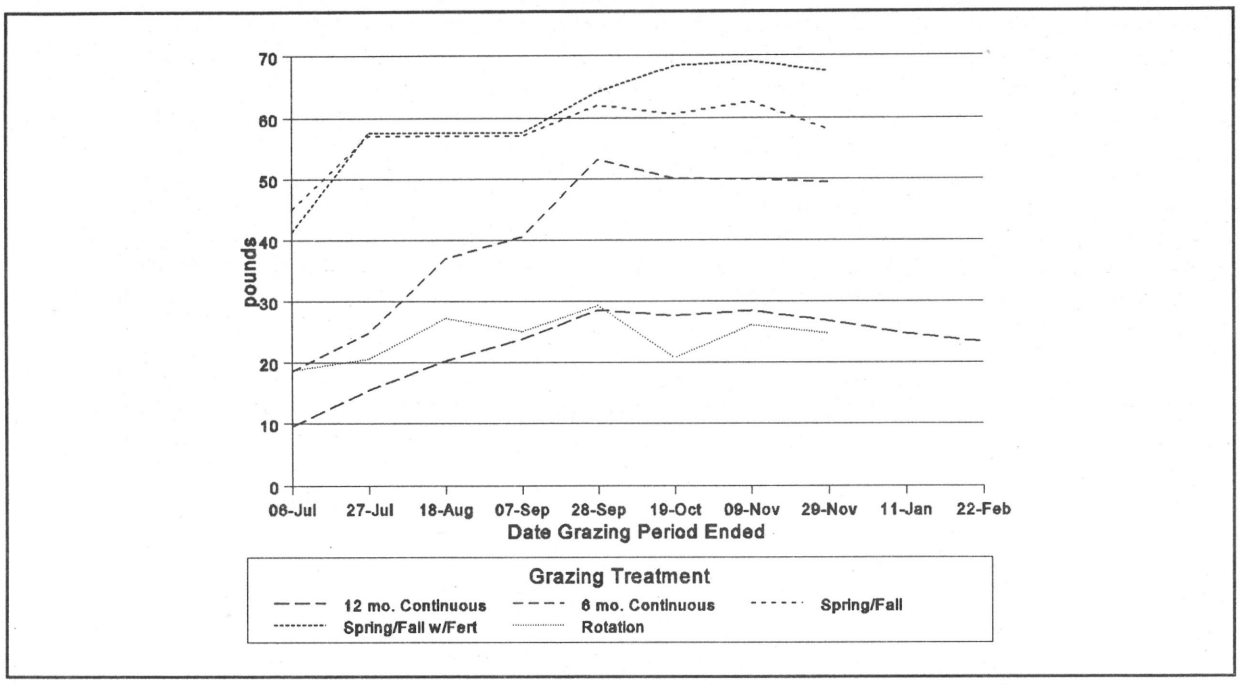

Figure 9. Cumulative gain per acre by heifers grazing weeping lovegrass at Clovis, 1994.

Conversion of CRP Land to Annual Crop Production

A tillage research/demonstration trial is being used to evaluate various tillage systems for their effectiveness in converting CRP land back to annual crop production. The tillage trial is located on CRP land owned by Stanley Pipkin. It is approximately 14 miles north of Clovis and was established to weeping lovegrass (cultivar unknown) in 1987. Soil at this site is Pullman loam. Precipitation received during the 1994 growing season was approximately 11.7".

Three management systems (conventional tillage, minimum tillage, and no-tillage) are being evaluated for converting CRP grass to wheat or grain sorghum production. Tillage plots are split into two pre-tillage treatments. One-half the plot area was burned before tillage practices were initiated in spring 1994. The other half of the plot was not burned.

Treatment sequences for the establishment of the 1994 grain sorghum crop were as follows:

Conventional Tillage

April 21 -	No-burn portions of study were mowed
May 16 -	Burned one-half of area
May 16 -	Disked, moldboard plowed, and disked entire area
May 17 -	Disked one additional time
May 31 -	Planted grain sorghum (3 lb/ac)
November 3 -	Grain sorghum harvested

Minimum Tillage

April 21 -	No-burn portions of study were mowed
May 16 -	Burned one-half of area
May 16 -	Disked entire area three times
May 17 -	Disked one additional time
May 31 -	Planted grain sorghum (3 lb/ac)
November 3 -	Grain sorghum harvested

No Tillage

April 21 -	No-burn portions of study were mowed
May 16 -	Burned one-half of area
May 17 -	Sprayed entire area with Roundup® (16 oz/ac)
May 31 -	Planted grain sorghum (3 lb/ac)
November 3 -	Grain sorghum harvested

Initial data for 1994 indicate the conventional tillage system produced much higher yields than the minimum or no-till production systems as shown in Figure 10. It should be noted that the timing of treatments in 1994 was not ideal. Due to difficulties associated with project startup, it was not possible to initiate tillage practices with sufficient advance time to allow for grass and surface residue decomposition. In addition, there was insufficient time to allow for effective herbicidal control of established perennial grasses before spring planting. Rapidly growing perennial grasses had utilized much of the available soil moisture prior to establishment of the sorghum crop.

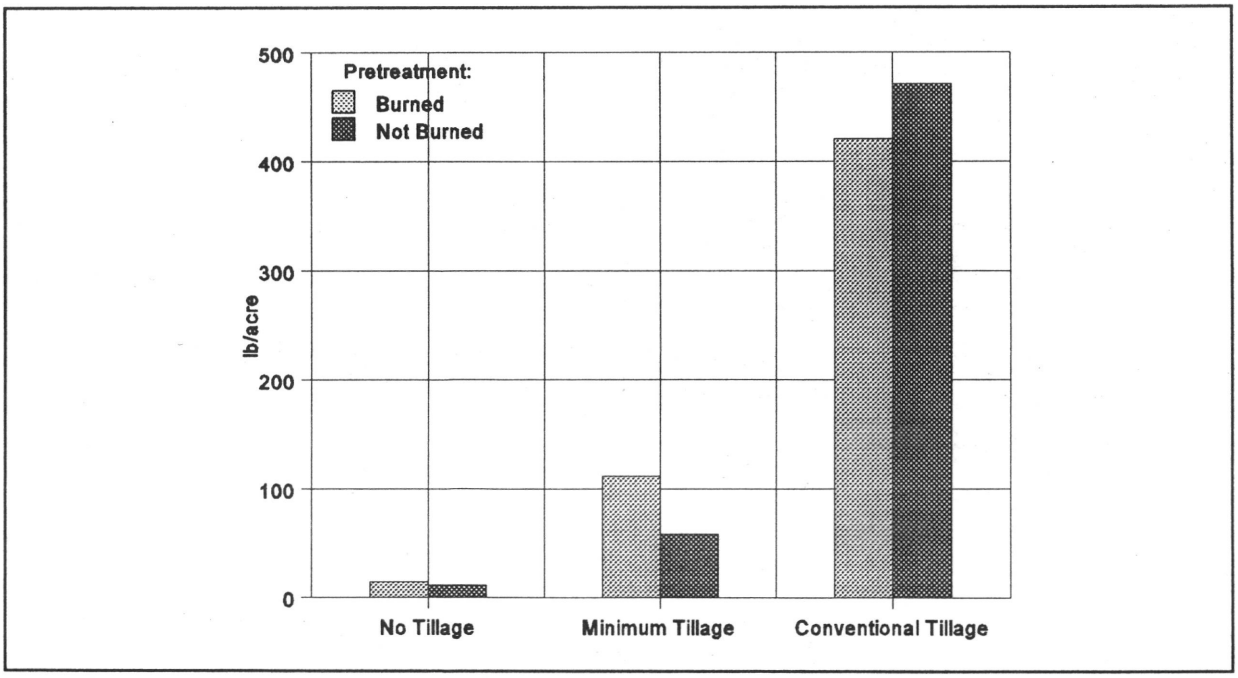

Figure 10. Grain sorghum yields from CRP cropping systems plots at Clovis, 1994.

The extremely low yields of the no-till system are largely attributed to the ineffectiveness of herbicidal grass control. Perennial grass competition was too great for the no-till system to be effective without several months lead time. Higher yields in the conventional tillage system are probably due to better grass and weed control as compared to the other tillage systems. Yield differences between the burned and no-burn areas were small. However, visual observation of the plants during the growing season suggested the no-burn areas had more moisture available for plant growth than the burned areas.

A crop of winter wheat was established at this site on September 8, 1994. Although herbicide treatments to control perennial grasses were initiated four months before planting, it appears the no-till wheat will yield much less than the wheat planted under the minimum or conventional tillage systems. Yield data will not be available until June 1995.

Development of Wildlife Habitat on CRP Land

A tract of land next to the tillage trial is being used to identify and demonstrate techniques for enhancing wildlife habitat on CRP and post-CRP land. Through water shedding techniques, more than 100 deciduous and evergreen shrubs have been successfully established. The shrubs include Pfitzer juniper, Russian olive, New Mexico foresteria, desert willow, native plum, Nanking cherry, fourwing salt-bush, and Wood's rose. The shrubs were planted in a shallow V-trench on May 9, 1994. After planting, the trench was lined with woven plastic weed barrier with slots cut for each shrub. This method allows precipitation to collect around the plant, maintains soil moisture, and eliminates the need for weed control. The shrubs received no supplemental water after planting. Precipitation at the site was 83% of the long-term average. Nearly all species have 100% survival rates and exhibited good growth in 1994.

Grain sorghum was planted as an annual wildlife food plot. The food plots experienced the same lack of moisture and perennial grass competition discussed in the previous section of this report; however, the plots were successful in producing food for wildlife consumption.

The project has shown it is possible to establish woody plants for wildlife cover and annual wildlife food plots with a minimal investment of time and money. Whether CRP land is returned to cropland, converted to grassland, or remains in CRP for several more years, producers should consider maintaining and developing areas for wildlife habitat.

Other Components of the CRP Project

Several other components of the project have not been discussed in this report, as most are in the initial phases. Site-specific environmental data will be collected from the grazing and crop production systems being evaluated by the project. This will provide for estimating and comparing the potential soil erodibility. Cost and return budgets will be developed to assess the profitability of the different production systems. Where appropriate, budgets will be based on production data obtained from the on-

farm field trials. Additional information will be obtained from "typical farm" budgeting and integrated systems approaches. Government policy options that may be available to participants upon expiration of the current CRP will also be evaluated for profitability.

A project advisory board of farmers, USDA Agency Personnel, and area businessmen is providing direction for improving and fine tuning project activities. Project results are being distributed to interested individuals through annual field tours, presentations at agricultural producer meetings, and through the local and regional media.

For additional information about the CRP research/demonstration project, contact Rex Kirksey, Project Coordinator at (505) 461-1620.

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