

Conservation Innovation Grants Semiannual Progress Report Template

Grantee Name: Tim Reinbott

Project Title: Demonstration of Farm Profitability Utilizing Management Techniques that Promote Soil and Water Conservation Practices and Improve Pastures

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Project End Date: October, 2009

Summarize the work performed during the project period covered by this report:

Field Border:

Root Plow:

In 2009 soybean and corn were planted along a field border edge with different management techniques to compare yield. Corn was planted in 30 inch rows beginning at the field border and soybeans were planted in 15 inch rows. Edge management techniques consisted of a 30'CP33 strip, 60'CP33 strip, planting to wooded edge and planting to wooded edge which had been root plowed for two consecutive years. Corn yield will be determined by harvesting a single row of corn for at least 90 feet of each treatment. Soybean yield will be determined by harvesting a single 15 inch row of similar distance. Corn and soybeans harvest will be conducted in October 2009.

CP33 Buffer Size: One of our objectives is to examine yield differences associated with cropping systems planted next to either a 0, 60' and 120' CP33 border. Since 2007, corn and soybean have been rotated along two different CP33 buffer strips and one tall fescue waterway. Plots size will be approximately 30'X 100'. Corn will be harvested in October 2009 on a per row basis for up to 30 ft (12 rows).

Field Border Orientation:

Beginning In 2006 an area was dedicated to demonstrate the differences in soybean and corn yield along wooded edges that have a north/south orientation compared to those that have an east/west orientation. Soybeans were planted late and in some instances replanted because of the wet spring in 2009 causing the harvest to be delayed until late October

Invasive Specie Control:

Our objective was to demonstrate effective means of the eradication and control of two of invasive plant species that are spreading in the mid west, sericea lespeza and reed canary

grass. We evaluated several treatments for controlling sericea lespedeza and reed canary grass. Which include:

Sericea: In spring 2007 plots were established in dense stands of sericea at Bradford Research and Extension Center and at Baskett Wildlife Area. The plot size was 30'X 100' and replicated three times at each location. Treatments included 1. Spring burn followed by Remedy (Triclopyr) herbicide application of 1.5 pts/acre in June; 2. Remedy application in June; 3. Spring burn followed by Remedy herbicide application in June using 1.5 pts/acre and then Ally (Metsulfuron) application in September 0.5 oz/acre; 4. Ally application in September using 0.5 oz/acre; 5. Spring burn followed by Ally application in September using 0.5 oz/acre; 6. Control. Treatments were conducted on a yearly basis and in September of 2009 ratings were made to compare the effectiveness of the treatments.

Reed canary grass:

In the fall 2006, a 1000 ft grass waterway had been divided into several 10 x 30 ft plots in order to show different management techniques to control the invasive grass. These plots were burned and sprayed with various herbicide treatments including 1. Spring burn followed by Roundup after green up in April; 2. Roundup applied in April at early green up; 3. Spring burn followed by Roundup after green up in June; 4. Roundup applied in June; 5. Fall burn followed by Roundup after green up; 6. Fall mowed followed by Roundup. Similar to the Sericea the reed canary grass treatments were conducted for each year and the final evaluations of the treatments were conducted in September.

Alternative Forages:

Our objective is to examine alternative forage options for the replacement of tall fescue in terms of forage quantity and quality. Tall fescue is an important tool in decreasing soil erosion and provides very dependable and consistent forage for livestock producers. Some of the draw backs include loss of habitat for wildlife and its invasive nature. Suitable alternatives will have an important role in promoting wildlife, erosion control and also provide the consistency in quality and quantity our livestock producers require. Demonstrations were established in winter/spring 2007 and in the summer of 2008 plots were harvested with a Hege forage harvester. Each harvest consisted of a 3.3'X30' pass. Each plot was split into two equal portions in March 2009 and one side had a nitrogen application of 60 lbs/acre while the other portion was left untreated. This procedure was implemented to compare competitiveness of the forbs and legumes if the grasses were fertilized and to see if the native grasses would respond to nitrogen fertilizer in forage quantity and quality. The Base treatments included: 1. Tall fescue control; 2. Tall fescue with native forbs mix; 3. Tall Fescue, Switchgrass and Big bluestem; 4. Virginia wildrye with native forbs mix; 5. Virginia wildrye plus Big bluestem; 6. Virginia wildrye and Big bluestem with native forbs mix; 7. Virginia wildrye and river oats plus native forbs mix; 8. Switchgrass plus native forbs mix; 9. Eastern gamagrass plus native forbs mix; 10. Forb mix without grass. The native forbs mix contains Showy tick trefoil, Illinois bundleflower, Oxeye false Sunflower, Greyheaded coneflower and Stiff goldenrod. Data will be presented in a final publication to the NRCS.

Quail Cover Bundles:

A comparison between using RPM and bare root seedlings for Quail Cover Bundles was initiated in 2007. The following shrubs were planted as a bare root in spring 2007 and as a RPM (Root Production Method) in October 2007: False indigo, Wild plum, Aromatic sumac, and Roughleaf dogwood. These shrubs are commonly used by landowners wanting to provide habitat for wildlife. However, the question that is often asked is it better to use bareroot seedlings or pay more for potted plants? Monitoring this planting over the next few years for survival and growth should answer this question. During the fall of 2008 and spring of 2009 chemical weed control was applied to limit competition of non target plants.

Bird Survey:

The local Audubon Society has continued to make monthly bird counts at Bradford. In the fall 2008 BREC partnered with the Missouri Department of Conservation (MDC) and University of Missouri-Columbia student Chapter of the Wildlife Society to perform a Bobwhite quail call survey. Bradford was separated into five sections. In each section a set of volunteers would listen and record location of Bobwhite quail song counts. Lisa Potter of MDC was the lead person on this survey and conducted the survey with the same operating procedures at their state wide surveys. In October of 2009 we will continue this partnership and conduct the Bird surveys. Lisa Potter of MDC will lead this group and we will conduct there surveys on five location of BREC. It is our hopes that the population will have increased due to our efforts.

Describe significant results, accomplishments, and lessons learned.**Compare actual accomplishments to the project goals in your proposal:****Root Plowing, CP33 Buffer Size and Field Border Orientation:**

We wanted to demonstrate to farmers that there are several options that they can use to increase wildlife and increase profitability when managing field borders and wooded draws. The results thus far have been surprising but also clearly demonstrate that there are alternatives to planting right up to the field border. We have been able to look at two seasons worth of data and have planted a rotation for the 2009 season. Each season has presented differences in weather that would be considered extreme but the responses to our treatments were similar in each season and we expect similar results for the 2009 harvest.

One surprise has been that the root plow has shown very little advantage in yield with corn and soybean yield still suffering near the field border. This indicates that the completion for light is extreme has affects yield more than we previously thought. When comparing a 30 ft CP33 buffer to a 60 ft or greater size there seems to be a yield advantage of the 30 ft buffer. We can best explain this by the greater amount of animal damage in corn next to the wider buffers.

Results in 2009 will be collected in October and November and will be compiled for a final report and published as a Technical Report.

Invasive Specie Control:

Sericea Lespedeza: In our demonstrations we are seeing a gradual change in the species composition within the each treatment. Complete eradication is not being observed however, a shift in species dominance is occurring which over time could lead to the eradication. The BREC portion of the demonstrations showed that the greatest shift was in treatment off spring burn followed by Remedy herbicide application in summer and Ally application in the fall. This was followed closely by treatment of Ally herbicide in the fall. Each of the effective treatments included the use of Ally herbicide. Suggesting that burning had no major effect and that chemical use of Ally is the best option.

However, good management practiced would suggest rotating chemical families to avoid any resistance build up. AT BREC demonstrations were separated into a wet and dry areas. Overall, treatments in the wet area had less percentage of Sericea. When the Sericea was suppressed, Indian grass began to become established and became a major competitor with the Sericea whereas in the wet area foxtail is the competitor

In September 2009 final compositions were recorded for both the BREC area an Ashland Area. Once again the dry area was more favorable for Sericea growth but herbicide treatments were able to drastically reduce Sericea density. In the dry area control plots of Sericea averaged around 40% Sericea in the wet area it was in the 10% range. Treatments that worked best in both of theses areas is simply just a Remedy application in June which eradicated most of the Sericea. Other treatments with similar effective results in both areas included the spring burn followed by Remedy in June and then followed by Ally in fall. These treatments had approximately 1% Sericea. When treatments included Ally alone Sericea percentage was decreased to similar levels. Treatments at BREC overall showed that a repetitive chemical approach did decrease the overall existence of Sericea. These results also show that suppression can be enhanced when a native grass is present.

Ashland plots were more uniform do to the position on a hill side. Final stand estimates we recorded on September of 2009. Sericea showed similar decreased population densities as BREC. Our controls at Ashland had a higher population of Sericea averaging 70% of the plot. The most effective treatment included a spring burn followed by Remedy in June then followed by Ally in the fall. This resulted in no Sericea being present in the estimations of the plots. Other treatments that performed well included the spring burn followed by a June application of Remedy which showed a 5% population of Sericea within the plots. The remainder of the treatments did not satisfactory suppress the Sericea. At Ashland giant foxtail was the dominate species with the best Sericea control treatments. When Sericea was not fully controlled Indian grass dominated. This holds true at the BREC locations as well. Another interesting observation is that either Indian grass and Big Bluestem dominated alone and were seldom recorded together.

Reed Canary Grass:

As with Sericea, full eradication of reed canary grass is not being observed with a combination of chemical and burn treatment. Our most effective treatment with this species is using glysohate (Roundup) in the spring and early summer before reproductive maturity. The only positive responses were treatments that included a glysohate component before reproductive maturity. Reed Canary Grass suppression

resulted in replacement with Rice Rip Grass. Although spring application of glyphosate suppressed Reed Canary Grass for the remainder of the season but was again dominate the following spring. Like the Sericea our objective will probably be met by long periods of constant management and hopefully species competition will prevail. As a side note mowing in the fall took place after a hard freeze it was noticed that there were many green shoots under the dense cover of the season's growth. This stirs a question about the length of the growing season. Having a longer growing season might enable management option to be altered to treat the area with a herbicide that will be absorbed during the winter months therefore specifically targeting only the Reed Canary Grass.

Final observations were made on the Reed Canary Grass Plots in September 2009. It was earlier recorded that the most effective treatments had a Glysophate component. We observed similar responses this season. Our treatments that applied Glysophate in April have a dominance of Rice Rip Grass our treatment which applied Glysophate after the spring burn also showed some signs of Reed Canary Grass suppression but not as significant as the earlier application. Our information collected show that if you are interested in controlling Reed Canary grass the mid-late spring application will be sufficient in suppression. Reed Canary Grass is a wetland species so it will present challenges for application and timing of Glysophate.

Alternative Forages:

Based upon observations and questions in 2008 we examined the role a nitrogen application would have on tonnage produced. We have total yield but quality has not been finalized as of yet but will be included in our final report. One significant difference that occurred in 2009 is that a monoculture of tall fescue dropped out of the top yield groups and only when mixed with native grasses in the top three. When a 60 lb N/acre treatment was applied the top three yields were 3.9, 3.5 and 3.5 tons /acre. Cave-in- rock Switchgrass with the forbs mix was top yielder followed by Tall fescue Switchgrass and Big bluestem mix and the third place was a Virginia Wildrye river oats forbs mix. This shift from tall fescue to the native warm season grasses (switchgrass and big bluestem) and the native cool season grass (Virginia Wildrye) indicates that it takes at least three years for these to fully establish whereas tall fescue establishes much quicker. Our 2009 data with no N applied also showed a significant change with tall fescue yield at the bottom of the ranking. The top three yields were 3.25, 3.00 and 2.88 with the top yield produced buy the Switchgrass forbs mix followed by a pure forbs mix and lastly the Virginia Wildrye River oats and forbs mix. Without nitrogen forbs were much more dominant than grasses. It will be extremely interesting to see if there are any differences in forage quality.

Bird Survey:

A total of 145 different bird species have been identified at Bradford that include many raptors, shorebirds, and water fowl. Thirteen of the species identified are considered species of interest and it is essential that their habitat is preserved. As habitats develop there will be more opportunities to determine use for nesting and attracting other species of birds. Results from the 2008 Bobwhite quail survey show that BREC's quail population is at 0.44 birds per acre or approximately 38 coveys. This is particularly exciting because the goal set by MDC for our area is 1 quail per 15 acres we have approximately 6.6 birds per 15 acres. This increase has interested many researchers, land managers

and general public. This is no doubt due to the efforts made by BREC via the CIG moneys.

BREC is preparing for the 2009 October quail count which will once again be headed up by Lisa Potter (Resource Biologist) from the Missouri Department of Conservation and several student volunteers from the Student Chapter of the Wildlife Society. Judging from the number of sightings during the nesting season we are anticipating an increase in the number of birds. This event will take place on at least two mornings where quail calls will be documented in six pre designated areas of BREC. Lisa Potter will analyze the information and compute the densities from the call counts.

Field Days:

On June 18th 2009 BREC hosted a Bobwhite Quail Management and Native Plant field day. This event was attended by over 150 landowners throughout Missouri. They had the opportunity to see the field border, edge feathering, diversion channel restoration, alternative forages, and warm season grass management as they were being implemented. Speakers were from MU, Lincoln University and the Missouri Department of Conservation. There were also attendees from Minnesota, Arkansas, and Indiana who are wanting to implement these types of educational activities in their states. Several other tours such as with the National Crop Insurance were given throughout the summer that highlighted the demonstrations described here.

Describe the work that you anticipate completing in the next six month period:

The final report will be prepared in a Technical Bulletin Format.

In the space below, provide the following in accordance with the Environmental Quality Incentives Program (EQIP) and CIG grant agreement provisions:

- 1. A listing of EQIP-eligible producers involved in the project, identified by name and social security or taxpayer identification number.**

See attached for list of participants at the Integrating Bobwhite Quail Management and Native Plant Field Day.

- 2. The dollar amount of any direct or indirect payment made to each individual producer or entity for structural, vegetative, or management practices. Both semiannual and cumulative payment amounts must be submitted.**

NA

- 3. A self-certification statement indicating that each individual or entity receiving a direct or indirect payment for any structural, vegetative, or management practice through this grant is in compliance with the adjusted gross income (AGI) and highly-erodible lands and wetlands conservation (HEL/WC) compliance provisions of the Farm Bill.**

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