

CONSERVATION INNOVATION GRANTS FINAL PROGRESS REPORT

Three Rivers Resource Conservation and Development

Productive Conservation on Working Lands NRCS 68-3A75-6-117

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6/1/2010 to 11/31/2010

Date Submitted: 12/22/2010

Grant funds used to date: \$633,520.50

In-kind and matching documented to date: \$795,600.00

PCWL WORK SUMMARY:

During this reporting period the primary focus has been on securing future funding, finishing work on the PCWL Technical Handbook and completing outreach and project dissemination. We finished a hazelnut propagation guide which we distributed to several project cooperators. This guide will also remain available free of charge in PDF format on the PCWL website. This guide will assist hazelnut growers with propagation of their most productive bushes. This knowledge will allow them to increase yields over time without the expense and unknown genetic potential of purchased seedlings propagated from seed.

SIGNIFICANT RESULTS, ACCOMPLISHMENTS, AND LESSONS LEARNED:

GOAL I: TO FINALIZE THE PCWL MODEL, AND DEMONSTRATE SUCCESS NEEDED TO SECURE PRIVATE, STATE AND FEDERAL FUNDING FOR A LARGER SCALE STATEWIDE DEMONSTRATION PROJECT OR NATIONWIDE PROGRAM.

This objective in regards to perennial crops has largely been pre-empted by the Biomass Crop Assistance Program, and some components of the EQIP program. BCAP and EQIP offers higher establishment incentive rates and harvest subsidies than PCWL is able to offer.

Seeing the duplication of other federal programs as unnecessary and wasteful, we continue to seek funding that will expand or continue the work of PCWL by promoting practices and farming methods that allow conservation and profitable productivity to coexist. We are doing this by developing programs to promote agricultural practices and crops that help farmers achieve conservation goals while remaining profitable farm enterprises.

We continue to refer producers to federal programs such as BCAP and EQIP when appropriate as well as assisting in promotion of these and other federal conservation programs. We will also continue to develop a model for conservation programs that fits the concept of "Productive Conservation", but the crop establishment portion will likely be significantly different than the structure used for the current Productive Conservation on Working Lands program.

We have been investigating Minnesota State funding sources to support future Productive conservation projects, but unfortunately the majority of potential sources have focused on non-working lands conservation and habitat restoration. There are sources in Minnesota such as the Legislative-Citizen Commission on Minnesota Resources, and the Lessard-Sams Outdoor Heritage Council that fund conservation related work in Minnesota. Unfortunately for productive conservation, the emphasis in the request for proposals and the record of past projects funded generally focus on wildlife habitat restoration on land protected by a permanent conservation easement. There are also some projects that have been funded that focus on research investigating causes and remedies for water quality

impairments. Permanent conservation easements have been a hard sell in most row crop dominated areas of Minnesota. Most farmers shy away from placing permanent restrictions which would eliminate development potential and restrict land uses on their property.

OBJECTIVE A: THE RC&D COUNCILS IN MN WILL WORK WITH PROJECT PARTNERS TO FINALIZE PROGRAM DEVELOPMENT & PREPARE EDUCATIONAL/PROMOTIONAL/SIGN UP MATERIALS.

This was one of the first items accomplished at the early PCWL Technical Committee meetings. The PCWL Technical Committee consisted of representatives from NRCS, USDA Agriculture Research Service, RC&D coordinators, RC&D council members, non-profits and farmers.

OBJECTIVE B: THE RC&D COUNCILS IN MN WILL EDUCATE AND TRAIN PARTICIPATING SOIL & WATER CONSERVATION DISTRICTS (SWCD) AND NRCS STATE OFFICIALS ABOUT PCWL BY.

In order to fulfill this objective we attended many meetings of conservation professionals and volunteer conservation organizations. Among these was the 2007 meeting of Minnesota State Association of Soil Water Districts. This meeting was attended by over 600 conservation professionals from across the state. At this meeting we had a booth at the trade show displaying information on the PCWL program in addition to giving a presentation on the PCWL program. Our participation in this meeting lead to several leads for crop establishment projects and an interview with a local reporter. As a result of this interview we received some free advertisement in the form of an article on PCWL in the Minnesota news paper Agri News. This early publicity helped in our landowner recruitment for the crop establishment program. We were also asked to submit an article to Watonwan County SWCD news letter which is distributed in the Town and Country Shopper.

The following meetings were attended to educate participating SWCD and NRCS State Officials:

Meeting	Date	Location	Minnesota Association of RC&D Councils Winter Meeting	1/30/08	St. Cloud, MN
Fillmore SWCD Energy Fair	2/28/09	Fillmore County	Minnesota Association of RC&D Councils Summer Meeting	9/11/07	International Falls, MN
Greater Blue Earth Basin Alliance Technical Committee Meeting	6/20/07	Mankato, MN	Area 6 MASWCD Meeting	6/19/07	
NRCS Leadership Team Meeting	6/17/08	Rochester, MN	Area 6 Employee Meeting	7/10/07	St. Peter, MN
Minnesota Association of RC&D Councils Business Meeting	8/28/08	Willmar, MN	Pembina Trail RC&D Board Meeting	6/29/07	Red Lake Falls, MN

Coteau des Prairie RC&D Meeting	3/25/07	St. Cloud, MN	Minnesota Association of RC&D Councils Business Meeting	1/30/08	St. Cloud, MN
Coteau des Prairie RC&D Meeting	6/27/07	Slayton, MN			
North Central Association of RC&D Councils Conference	3/9/08	Rochester, MN			

OBJECTIVE C – THE RC&D COUNCILS WILL EDUCATE A MINIMUM OF 200 LANDOWNERS ABOUT PCWL PROGRAM.

Producer Meetings and Conferences Attended to Promote PCWL

Meeting	Date	Location			
Biomass for Energy: a Balancing Act	8/16/2007	Morris, MN	Biomass for Local Renewable Energy and Economic Development	3/26/2009	Ponsford, MN
Southeast Clean Energy Resource Team Hazelnut Farm/Passive Solar Greenhouse Tour	9/13/2007	Lake City, MN	Youth and Sustainability Confabulation	4/4/2009	St. Peter, MN
Dakota County Extension & Conservation Office	12/11/2007	Farmington, MN	Biomass Feedstock Tour	7/10/2009	Wadena, MN
Midwest Value Added Agriculture Conference	1/24/2008	Eau Claire, WI	A Sustainable Small Farm Experience	7/15/2009	Belle Plain, MN
Farmfest 2008	8/5/2008	Morgan, MN	Working Trees: Energy, Food and More	7/27/2009	7 mile Creek Park, Nicollet County
AgroEcology Summit Bioenergy Crops and Water Quality	8/15/2008	Windom, MN	Farmfest 2009	8/4/2009	Morgan, MN
A Whole-Systems Approach to Bioenergy	8/22/2008	Benson, MN	Perennials for Food and Fuel	8/14/2009	Benson, MN
Midwest Value Added Agriculture Conference	1/23/2009	Rochester, MN	Hazelnuts for Food and Fuel	9/26/2009	Lake City, MN
Fueling the Future: The Role and Use of Woody and Agriculture Biomass for Energy Workshop	3/19/2009	Morris, MN	Midwest Value Added Agriculture Conference	1/21/2010	Eau Claire, WI
			Midwest Organic and Sustainable Education Service Conference	2/25/2010	La Crosse WI

OBJECTIVE D – THE RC&D COUNCILS WILL SIGN UP APPROXIMATELY 25 LANDOWNERS TO GROW 1,000 ACRES OF PRODUCTIVE CONSERVATION CROPS.

During the course of the PCWL Crop establishment program we enrolled 25 landowners with 61 projects representing 975 acres. Of those 975 acres our participating producers were able to complete 837 acres before the end of this project. The high landowner match ratio on many of these establishments shows significant investment on the part of the landowners and a commitment to the success of these perennial crops.

OBJECTIVE E – LANDOWNERS WITH ASSISTANCE FROM THE RC&D COUNCILS IN MN AND PROJECT PARTNERS WILL PLANT AND MAINTAIN A MINIMUM OF 1,000 ACRES OF PCWL CROPS.

While the enrollment for the crop establishment portion of this project got off to a slow start, we were able to establish 837 acres of PCWL crops throughout the state of Minnesota. During the 3 year course of this project we saw drastic swings in the commodity grain markets. These economic conditions contributed to the slow enrollment. In northern Minnesota where land rent is significantly lower than the southern portion of the state, farmers were seeing wheat at \$6 per bushel. This combination of high grain prices and low rental rates made selling perennial conservation crops very difficult.

GOAL 2: INCREASE AND DEVELOP NEW MARKETS FOR PCWL CROPS.

OBJECTIVE F: THE RC&D COUNCILS IN MN WILL WORK WITH PROJECT PARTNERS TO IDENTIFY MARKETS FOR PCWL CROPS.

We have identified several current and potential markets for PCWL crops. However as market conditions are constantly changing, we will continue to put significant efforts towards this objective.

OBJECTIVE G: THE RC&D COUNCILS IN MN WILL EDUCATE A MINIMUM OF 12 PRIVATE BUSINESSES ABOUT THE BENEFITS OF PCWL CROPS, RENEWABLE ENERGY AND VALUE ADDED OPPORTUNITIES BY DECEMBER 2008.

This objective is complete. A partial list of businesses educated includes: Kaste Seeds, Mn. Native Landscapes, Rahr Malting, Feders Seed, Mankato Free Press, Agri News, MN. Farm Guide, Prairie Moon Nursery, McPherson Crop Management, Blue Earth Consulting, Ag Resource Strategies, Prairie Restoration Inc., Market Street Energy.

GOAL 3: RESEARCH, EDUCATION & PROMOTION OF THE ECONOMIC AND ECOLOGICALLY SUSTAINABLE PRODUCTION OF PCWL CROPS.

OBJECTIVE H: THE RC&D COUNCILS IN MN WILL WORK WITH RESEARCHERS TO COMPLETE RESEARCH ON PRODUCTIVE CONSERVATION CROPS. WE WILL EDUCATE POLICY MAKERS, GROWERS, AGENCIES, PRIVATE INDUSTRY AND OTHERS NATIONWIDE BY DECEMBER 2009.

PCWL MARKET DEVELOPMENT STUDIES:

ADDING VALUE TO THE BIOMASS COMPONENT OF THE TURF SEED INDUSTRY

This market study examined the value of marketing the biomass by-product of the turf seed industry in Northern Minnesota and developed a grower's guide which was distributed to turf seed growers in the region.

Grass seed crops have been raised in northwest Minnesota for several decades. The supply and demand curve for grass seed crops is similar to other crops (corn, wheat, soybeans). In times of short supply, the demand rises as does the price. Conversely, in times of excessive production, demand weakens, and prices fall. An additional risk associated with grass seed crops if market demand is weak, not only will crop movement come to a halt the crop cannot be sold. For example, if a grower has wheat in the bin and decides to sell, the farmer can haul to the elevator and get paid, even if the price is below the breakeven cost of production. For the grass seed crops this option doesn't exist. If market demand is weak the crop will stay in storage, as it has no place to move, and the producer cannot sell this crop until the market demand improves. This lack of a market can place tremendous cash flow demands on producers who have grass seed to sell in times of weak grass seed demand.

MARKETING MINNESOTA'S FIELDS AND FORESTS: RESEARCH ON THE POTENTIAL FOR DEVELOPING A FARM STAY DATABASE AND JOINT MARKETING PROGRAM IN MINNESOTA

Agritourism is growing in popularity throughout the United States, and this farm-stay study provided a starting point for the development of more agritourism opportunities in Minnesota. Farm-stay is an overnight, paid, guest accommodation situated on five or more acres of working lands. This report provides an initial understanding of the potential of farm-stay in Minnesota as a form of agritourism activity that might potentially boost rural economies. This study was a community-university supported initiative with major funding from the Productive Conservation on Working Lands (PCWL) program of Three Rivers Resource Conservation and Development, the University of Minnesota Extension, and the Center for Urban and Regional Affairs. Other project partners include the Center for Integrated Natural Resource Agricultural Management (CINRAM), and the Sustainable Farming Association of Central Minnesota.

DEVELOPMENT OF AN ECOLOGICAL COMMODITY PAYMENT PACKAGE [ECoPayPack]

The goal of this project was to develop an Ecological Commodity Payment Package [ECoPayPack] program for implementation by completing the following tasks:

- Complete an integrated assessment of multiple ecological commodity markets currently being used in the United States and internationally.
- Conduct a non-market valuation survey.
- Identification of ecological commodity buyers for perennial energy crops grown in Minnesota
- Develop a model ECoPayPack program for perennial biomass grown in Minnesota.

Rural Advantage was able to complete all objectives of the project and the report included in the Technical Handbook provides the results and findings from the project. This project could not have been completed without the involvement of several partners who brought expertise to the project at a variety of levels. They include farmers and landowners within the region; SWCD and NRCS staff; Dean Current- Center for Integrated Natural Resources and Agricultural Management; William Easter, William Pham – University of Minnesota; Jim Kleinschmit- Institute for Agriculture and Trade Policy; Shannon Fisher, Karnell Johnson and Susan Carlin- MN River Board; Brooke Hacker- Greater Blue Earth River Basin Alliance; Jim Klang- Keiser and Associates; Tom Green- Ag Flex; Brian Brant- American Farmland Trust; Dennis Fuchs and Carrie Raber- Stearns County SWCD; and Holly Kavorik- Sauk River Watershed District.

PCWL FIELD STUDY:

EQUIP ELIGIBLE FARMER PARTICIPATORY RESEARCH IN PROPAGATION OF HYBRID HAZELNUT FOR PRODUCTIVE CONSERVATION ON WORKING LAND

Hybrid hazelnut is a woody perennial crop with potential to enhance the

environmental sustainability of the agricultural landscape of Minnesota and at the same time provide a new economic opportunity for farmers. The biggest obstacle for growers interested in establishing commercially-viable hybrid hazelnut plantations is the lack of uniformly consistent planting stock. The hybrid hazelnut germplasm currently used is propagated from openpollinated seed, which results in plantations with too much variability to be effectively managed on a commercial scale. The only way to eliminate this variability is through vegetative propagation. Currently there are no consistently reliable methods for the vegetative propagation of hybrid hazelnut. This is a primary deterrent to the development of a viable hazelnut industry in Minnesota. In this collaborative on-farm project we will work with EQUIP eligible farmers to evaluate and develop techniques for the vegetative propagation hybrid hazelnut. Methods to be evaluated include mound layering, stem cuttings, and root cuttings. By working with growers we can expand our research capacity and make the research results directly available to farmers which will result in an immediate increase in the availability of uniform hazelnut germplasm. We have identified 83 hazelnut growers, of whom at least fifteen to twenty are interested in collaborating with us on this project. The initial objective is to develop techniques that will allow farmers to vegetative propagate their superior hybrid hazelnut germplasm for planting directly on their farms or marketing to other producers.

Summary

Developed a protocol for mound layering hybrid hazelnuts, and a how-to-bulletin to instruct growers in the method. The bulletin is available at <http://www.nuts.beestbuilt.com/>

Incremental progress was made in trials with softwood and hardwood stem cuttings. Although the use of hothouses as an alternative for rooting softwood cuttings did not lead to the break-through in rooting softwood cuttings that we had hoped for, hothouses did prove to be useful in rooting hardwood cuttings; we plan to continue research on this approach. For softwood cuttings, we also learned that collar suckers are more likely to be successful than the canopy cuttings we had been using, so future research with softwood cuttings will focus on collar suckers. Other than that, few of the variations in softwood cutting protocol that we trialed proved to be better than the protocol we had been using. The exception is that we learned that a lighter 1:8 peat:perlite rooting mix is better than the 1:4 mix we had been using.

In seedling trials it was learned that, as expected, seedlings grown in larger pots are more vigorous and thus more likely to survive than seedlings grown in small pots. Large pots are better even if many seedlings are grown together in open containers which requires root disturbance for transplanting.

This study found that hazelnut seedlings may be established in ground with minimal pre-plant soil preparation, as long as good weed control is provided. Woodchips and weed fabric are effective forms of weed control, as long as good quality weed fabric is used. However, the woven nylon

fabric available from DeWitt should be used only in situations where irrigation is possible, because it interferes with the infiltration of rainwater.

Four germplasm performance trials were established (St. Paul Experiment Station, Lambertson, Norm Erickson farm, and Larry Fickbaum farm), with a total of 606 clonal hazelnuts representing 56 different elite accessions.

An additional 202 clones were established from 15 different accessions, in stock plant beds, for use in future propagation trials, and for the production of additional layers that we will need for future agronomic trials.

Seedling hazelnuts were established at Dream of Wild Health, a native-American youth project in Hugo.

The best hazelnut bushes were harvested for yield data at five sites, and tracked performance at another 18 sites, either by flagging bushes that appeared to be exceptional or by collaborating with growers to collect data.

The work from this project was presented at four field days.

Funding was secured to continue this work through Oct. 2010, with two state-level grants of \$30,000 and \$40,000.

We wrote a total of eight grant proposals. Besides the three which were funded, one is still pending. The NCR-SARE grant will be \$175,000 for three years, starting in Oct. 2010. If funded, the Minnesota portion of the collaborative USDA-NIFA Specialty Crop Grant will be \$235,073 for five years, starting in Oct. 2010

Field Days and Seminars

Lois Braun presented this work at four field days in 2008 and 2009.

Sept. 13, 2008—Norm Erickson's annual Field Day, Lake City, MN. Gave a powerpoint presentation on both mound layering and stem cuttings. ~ 30 people

July 27, 2009—3rd Crop Walk and Talk at Seven Mile Creek Park near Mankato. Showed the mound layering work there. ~ 12 people in attendance

August 11, 2009—John and Terry Cuddy Farm near Maiden Rock, WI. Spoke about mound layering. ~ 40 people in attendance

Sept. 26, 2009—Norm Erickson's annual Hazelnut Field Day, Lake City, MN. Hosted a tour stop at a mound layered bush. ~ 30 people in attendance.

The first biennial Upper Midwest Hazelnut Conference is planned for March 12-13 in LaCrosse, Wisconsin.

Grant Proposals Written

During the 2008-2009 project period, our cooperators wrote or co-wrote eight grant proposals for continuation of this work.

Funded:

Hazelnuts as a Multifunctional New Crop for Minnesota – to the Minnesota Agricultural Experiment Station’s Rapid Agricultural Response Fund

Oct. 1, 2009 – Sept. 30, 2010, \$30,000.

Developing Native and Native-European Hybrid Hazelnut Germplasm and Agronomics for Minnesota – to the MDA Specialty Crop Block Grant Program

Nov. 1, 2009 – Oct. 31, 2010, \$40,000.

Developing Hazelnut Germplasm for the Upper Midwest – to the North Central Region SARE, submitted Oct. 30, 2009. Requested \$175,000 for three years.

Pending:

Developing Native and Native-European Hybrid Hazelnut Germplasm and Agronomics for the Upper Midwest – with collaborators in Wisconsin to the USDA-NIFA’s Specialty Crop Research Initiative, submitted Jan. 14, 2010. Requested \$235,073 for five years for Minnesota portion alone.

Not funded:

Development of Hybrid Hazelnuts as a Biofuel Feedstock for Minnesota -- to the U of M’s Institute on Renewable Energy and the Environment (IREE), submitted Nov. 2008.

Designer Fuels: Linking Biofuel Production and Utilization – to the U of M’s Institute on Renewable Energy and the Environment (IREE), submitted Nov. 2008.

Developing Native and Native-European Hybrid Hazelnut Germplasm and Agronomics for the Upper Midwest – to the USDA-NIFA’s Specialty Crop Research Initiative, due April 15, 2009 – failed to be submitted due to a clerical error.

Hazelnuts as a Multifunctional New Crop for Minnesota – to the Legislative and Citizen’s Committee on Minnesota Resources (LCCMR).

Assessment of Biomass Yield and Energy Value in Established Native Polyculture and

Woody Plantings in Minnesota Landscapes

The interest and use of woody and grass-based feedstocks for biofuel, bioenergy, and bioproducts is increasing because of the growing demand of alternative energy sources due to rising fuel cost. The Energy Independence and Security Act (EISA), investments in lignocellulosic biorefineries by the Department of Energy (DOE) and commercial entities, as

well as many other markets, security and policy drivers, have increased public interest in harvesting non-grain biomass from the lands. These non-grain-based biomass include grasses and woods. This interest is positive because it is creating investment and entrepreneurial opportunities in many rural communities.

This study was conducted to determine biomass production, chemical composition, and energy content of selected hybrid poplar clones and native grasses established in polyculture systems in Minnesota landscape to address the information needs of biomass producers and biomass technology users.

Utilizing Sustainable Crop Production Principles to Establish Local Ecotype and Native Perennial Grasses for Bioenergy Production

This Field Study was conducted by Luverne and Mary Jo Forbord, owners and operators of Prairie Horizons Farm and their partners: the US Fish and Wildlife Service, Chippewa River Watershed Project, Minnesota Department of Natural Resources and the Institute for Agriculture & Trade Policy. The Field Study examined various sources and rates of nutrient applications for sustainable biomass production.

Field study:

- Establish and maintain native perennial plants on 40 acres of farmland in row crops.
- Collect data on the sustainable establishment of native perennial grasses for biofuel production.
- Collect data on the sustainable establishment of native local ecotype grasses and forbs.
- Compare inputs, costs, yields, quality and sustainability of grasses, and grasses with forbs, under various agronomic treatments.
- Keep a photo journal to document progress and demonstrate comparative results throughout two growing seasons.
- Assess and test the feasibility of marketing the grass harvest to each of 3 local emerging biomass markets: University of Minnesota-Morris, Chippewa Valley Ethanol Cooperative, and Fibrominn.
- Harvest for seed and markets sought to test the feasibility and income potential of selling local ecotype seed.
- Plan, publicize and host on-farm research plot demonstration tours in 2008 and 2009.

Future Direction

Perennials are thriving on 40 acres where there were none previously. Our questions about sustainable biomass production methods are beginning to find answers. Certainly even more questions have arisen

throughout the years of the field study and demonstration, but we also have more people engaged and interested now in helping find the answers. For example, we want to further evaluate environmental impact of biomass harvesting in our system. We are currently seeking funding to refine our research, using rigorous scientific methods. Dr. Sharon Weyers and Dr. Margaret Kuchenreuther, Associate Professor of Biology at the University of Minnesota, Morris, MN, along with other cooperating researchers are writing proposals to assist in developing management techniques to produce the outcomes we desire: maintenance of a diverse stand of prairie grasses and forbs that enhances the ability of their farm to support wildlife, protection of the quality of their soil, and a sustainable and profitable harvest of biomass.

GOAL 4: DEVELOP A STATEWIDE MODEL THAT IS TRANSFERABLE TO OTHER PARTS OF THE NATION.

OBJECTIVE I: THE RC&D COUNCILS IN MN WILL DOCUMENT ALL WORK AND WILL WORK WITH NRCS TO CREATE MATERIALS/HANDBOOK (INCLUDING COST/BENEFIT ANALYSIS) NEEDED TO TRANSFER PCWL TO OTHER AREAS OF THE NATION BY DECEMBER 2009.

This objective is complete. 1600 copies of the handbook titled "Productive Conservation on Working Lands: A Guide to Growing and Marketing Perennial Conservation Crops" have been printed and roughly 1,500 copies have been distributed nationally to RC&D councils, legislators and project cooperators. The handbook is also available online at: <http://threeriversrcd.org/Projects/Productive-Conservation-on-Working-Lands/>

OBJECTIVE J: THE RC&D COUNCILS IN MN WILL WORK WITH THE NATIONAL ASSOCIATION OF RC&D'S TO DISSEMINATE PROJECT INFORMATION TO 375+ RC&D'S IN THE NATION .

This objective is complete.

OBJECTIVE K: THE RC&D COUNCILS IN MN WILL PROVIDE ONGOING EDUCATION AND REPORTS TO SECURE STATE & FEDERAL FUNDING FOR A LARGER SCALE DEMONSTRATION PROJECT.

We were unable to secure funding for the PCWL program as a whole. Other federal conservation programs such as EQIP and BCAP are currently offering greater incentives for establishing perennial vegetation than PCWL was able to offer.

LESSONS LEARNED:

CROP ESTABLISHMENT

During beginning of this project, we saw conditions such as record highs in the commodity grain prices that made selling the idea of planting perennial crops very difficult. Fortunately, through targeted advertising and direct communication with Soil and Water Conservation District and NRCS staff across the state, we were able to enroll 975 out of our goal of 1000 acres. Our participating cooperators were able to complete 837 acres before the end of this grant. We achieved a good geographic distribution of projects across the state and there were a good variety of crops represented. With the assistance of funds from this project Minnesota producers have increased the diversity of native grasses, forbs and flowers grown for seed in this state. The increased supply of these seeds will improve access to quality local ecotype seed mixes for habitat restoration and biomass plantings.

Crop establishments were not limited to native grasses though. While the overall acreage of PCWL crops was dominated by native prairie species, there were several small acreage projects that established berry bushes, hazelnuts and hybrid poplar plantings.

There were several surprises and lessons learned during the course of this grant. In the beginning of this project it was expected that the majority of the acres of crop establishment projects would be in the northern part of the state and would primarily consist of woody biomass plantings. What happened in practice was the majority of acres wound up being plantings of native prairie species. In retrospect, this made sense.

Farmers in traditionally row crop dominated areas are reluctant to plant trees on ground previously devoted to crops such as corn, soybeans and wheat. Several factors account for this reluctance. One of the biggest factors is the 3-10 year delay between planting woody crops and the first harvest. This delay poses an unacceptable risk to most farmers. Another problem we discovered with woody biomass was that companies utilizing the biomass are unwilling to forward contract prices for biomass. This price uncertainty scares off even more producers.

There was a loan program authorized by the Minnesota State legislature called the Advance Agro-forestry Loan Fund. This fund was developed to provide an advance loan for producers of hybrid poplar trees to help cover their expenses while their trees reach maturity in 10-15 years. Unfortunately due to very strict wording in the legislation this loan fund was available only to growers of hybrid poplars. In addition, the terms of the advance loan were seen as unfavorable by many producers. As a result very few producers took advantage of this fund. The original PCWL budget called for using \$200,000 in these loan funds for matching the federal funds from the Conservation Innovation Grant Program. Since very few producers were interested in planting hybrid we were unable to utilize any of these state funds for matching the federal portion of our grant.

Fortunately we were able to recruit many producers who were interested in planting native grasses for seed and biomass production. Many of these producers established native prairie flowers and forbs that are in very short supply. As a result the seed costs for these plants are quite high. In many cases the seeds were harvested by hand from established native prairie remnants. In other cases the producers started the native prairie plants in a green house to ensure their successful establishment. With the labor intensive techniques used to ensure the success of these plantings, also came high establishment costs.

In contrast, farmers planting native grasses have a relatively wide choice of marketing opportunities, and shorter turnaround between planting and harvest. When looking to market their native prairie crops, farmers have the choice between focusing on seed production, biomass for energy, livestock fodder and even landscape mulch.