CSAGPA Projects - NW Saskatchewan

K. E. Benjaminson, E. N. Johnson

The goal of the CSAGPA Farm-Based Program was to change the way agricultural - related resources are managed and to promote the adoption of environmentally friendly production practices.

There were over 70 projects completed during 1994/95 - 1996/97. Several of the projects were presented in the poster and are detailed below under the headings: Integrated Weed Management; Water Quality; Forage and Pasture; and Alternate Energy.

Integrated Weed Management

Weed Biocontrol

Several projects in the NW region dealt with weed biocontrol.

A mail and field survey was conducted to determine persistent perennial weed populations in 10 RM's. Five weeds were surveyed: yellow toadflax, scentless chamomile, leafy spurge, tansy, and absinth. Maps showing the location and abundance of the weeds were produced using a GIS database. Some of the information from the survey was used to write the fact sheet Yellow Toadflax: A Problem Weed in NW Saskatchewan which was also funded by the Green Plan.

There were several releases of biocontrol agents done in the region. Mecinus *janthinus* and *Apion* hookeri were the insects released to evaluate their respective effects on yellow toadflax and scentless chamomile. The main objective of most of these releases was to evaluate the insects' survival and overwintering capability. Analysis of the scentless chamomile seed heads collected have shown that *Apion hookeri was* able to successfully overwinter in the region. Biocontrol is a slow process and the insects' impact on scentless chamomile populations will have to be closely monitored in the future.

There was one detailed release site near Baldwinton where toadflax populations were assessed prior to and after release of the insects. Releases of insects was done under replicated caged conditions. The purpose of this detailed release was to gain information on the impact of the insect on the toadflax populations, as well as the insects' survivability and ability to reproduce.

There was also a survey of RM's in the region to investigate the feasibility of a long-term regional biocontrol program that the RM's would fund. Survey results indicate that RM's are willing to contribute financially, on a yearly basis, to a regional fund that will allow continued biocontrol evaluation and demonstration in the region.

Potential Pesticidal Use of Natural Compounds from Rhubarb

The objective of this project is to study potential pesticidal properties of rhubarb leaf extracts on pests in selected horticulture and ornamental crops.

The extract made from the rhubarb leaves was tested on several pests and was found

to have a deleterious effect on *Trichodusia ni,* cabbage looper.

Reduced Herbicide Rates in Saskatchewan

The objective of this project was to review current research data to develop a better understanding of the conditions under which acceptable weed control can be achieved with less than recommended herbicide rates. Farmers can make use of the information for weed control decisions that will: increase profitability, reduce the risk of selecting for herbicide resistant weeds, and reduce the amount of herbicide being introduced into the environment.

The project deals with five commonly used herbicides: Achieve, Assert, Horizon, Triumph Plus, and Poast. The ECW WeedTriev database is used to generate summaries of research conducted on these herbicides in western Canada. Data searches on these herbicides have been conducted to determine the effects of factors such as: environmental conditions at time of spraying, spraying time relative to days after weed emergence, water volumes, time of day of application, etc.

Other benefits of the project include; identification of gaps in current research, and the value of the WeedTriev database for developing weed control recommendations.

Water Quality

Batch Coagulation of Dugouts

Two dugouts in the Turtleford area were part of the Water Quality Initiative that was carried out at many locations in Saskatchewan by PFRA, Sask. Water Corp., and SRC. Both dugouts were treated with aluminum sulphate to clear up turbidity. The treatments in NW Saskatchewan were very successful.

Nolin Creek Watershed Study

The Nolin Creek Watershed, located south of Meadow Lake, was studied to assess the impacts of forestry and agriculture on water quality.

Overall, the quality of water in Nolin Creek is not being adversely affected by agriculture or forestry. All of the pesticides tested for were below detection limits in the water samples taken.

There were several small areas along the creek where riparian areas were overgrazed and being trampled by cattle and where the natural meandering of the creek has been straightened along an annually cropped area; these issues could become a concern in the future. It was noted in the study that the presence of many beaver dams along the creek appears to be minimizing the erosion of the stream banks in the overgrazed areas by slowing the velocity of the water.

Spawning sites for white sucker and northern pike are available in the stream and Nolin Creek does have some importance to local fish populations as a spawning site. Nolin Creek feeds into Meadow Lake which is the drinking water supply for the town of Meadow Lake.

The information collected will be useful for future land use planning for both

agriculture and forestry.

Forage and Pasture

Annual Forage Crop Evaluation

The objective of this project was to define best crop and variety choices for production of green feed or silage. Different crops and varieties were evaluated for yield and technical suitability for forage harvest and forage quality.

Year one results showed that Bonanza, CDC Earl, and CDC Dolly were the best barley genotypes. The good yield of the 2- row cultivars CDC Dolly and Manley compared well with the 6-row varieties Bonanza, Brier, and Virden. This data suggests that high yielding 2-row types can produce good forage yield and quality. Oat differences were not as evident. Genesis had the best combination of yield and quality of the wheats compared. Of the triticale's compared: Frank had better quality than Wapiti, but Wapiti was higher yielding, and the difference may be a trade off. Banjo was also evaluated but the seed was poor therefore, results are not conclusive. Note that year two data is currently being evaluated and could change the above rankings.

Spring Wheat Cultivars and Weed Competition

The objective of this project was to identify wheat varieties that differ in ability to compete against weeds. Currently listed spring wheat varieties have not been assessed in order to determine whether they differ in their ability to suppress weeds. If competitive varieties can be identified they could be recommended to producers who are interested in organic grain production or reduced herbicide use.

Results from year one and the preliminary results from year two show that CDC Merlin and AC Minto are the most competitive varieties. Genesis and Oslo were the least competitive varieties.

Feasibility of Harvesting Native Plant Material in NW Saskatchewan

The objectives of this project are to: investigate the market potential, methods of harvesting, processing and agronomics of native plant materials in western Saskatchewan, focusing on reclamation in NW Saskatchewan. To date, revegetation activities using native grass species have been limited in Western Canada by a lack of native seed.

Results of the project have shown that harvesting native plant seed from the wild seems to have limited feasibility in meeting supply requirements. Results from the plot experiments have shown that the best success so far has been with crimping* of native hay mulch. However, many of the species that were seeded two years ago are just starting to come up now. Hence, further evaluation will be warranted.

The market potential study identifies existing suppliers and buyers in Saskatchewan and the species produced. This report also discusses current and future demands and needs of buyers and lists the technical experts and resources available to individuals involved in reclamation and other activities that use native plant materials.

*Crimping is a seeding method that uses a machine with in linecoulters with non-jagged edges (so that the straw is not cut) to push the native hay mulch into the soil after the mulch has been unbaled, shred, and spread.

Feasibility of Pelletizing Comfrey as a Feed Supplement for Poultry and Livestock

The objectives of this project are to: look at the factors associated with production of pyrrolizidine alkaloids (PAs) in comfrey; determine the feasibility of dehydration and pelletizing of comfrey; and test whether alkaloid-free comfrey pellet can be produced from PA-containing comfrey by manipulations of processing conditions.

Comfrey, *Symphytum officinale* L. is a coarse perennial herb. It is an important animal feed in some parts of the world and was shown to prevent digestive disorders in poultry and livestock, especially scours in calves. Unfortunately PAs, which are toxic to the liver, have been found in comfrey.

Comfrey was successfully grown and pelletized. Testing for PA content is extremely difficult and this has impeded that aspect of this project. However, the existence of PA free comfrey cultivars (in Europe) was discovered during the course of this project.

Poplar Management Project

The objective of this project was to evaluate and demonstrate practical methods for poplar regrowth control and regeneration in the Manito Sandhills. Bark scraping, prescribed burning, and controlled grazing were the methods to be studied.

Two of the main resource management issues in the Manito Sandhills are poplar control and rejuvenation. Most mature stands of poplar in this area are in poor condition, becoming decadent with deadfall limiting their use by both livestock and wildlife.

Field scale plots of bark scraping were compared. Scraping treatments varied by type of equipment used and timing and frequency of scraping operations. AAFC also had small scale plots evaluating bark scraping treatments at the Manito Sandhills site. Fact sheets explaining the results of these trials are available.

Alternate Energy

Feasibility of Wind Power In NW Saskatchewan

The objective of the project was to find out if weather conditions in NW Saskatchewan are suitable for wind power generation on the farm and if it would be economically feasible.

Wind data was obtained from the Scott Experimental Farm where wind data records have been kept since 1923. Models of wind turbines that could supply an average farm's power requirements were investigated. It was determined that there would be sufficient wind speeds for a 10-Kw wind turbine to generate power 56% of the time and that would be inadequate for providing complete dependence on wind generated power.

The economic study showed'that on-farm power generated from wind would cost 34 cents per kilowatt hour while the Sask. Power utility costs 6 cents per kilowatt hour.

A brochure outlining the results of the wind power study is available.

NW Green Plan Summary Publication to be Available April, 1997

The NW Green Plan Summary Publication will outline the results of Farm-Based, Innovative Partnerships, and Research Green Plan projects undertaken in NW Saskatchewan. Fact sheets and brochures funded by the Green Plan will also be included.

The Green Plan Summary publication will also inform producers about where to obtain full reports, and additional information on a particular topic.

These booklets will be sent to all SAF, PFRA, and AAFC offices in NW Saskatchewan and should be available during April, 1997.