

Environmentally Sustainable Agriculture Initiatives Program (ESAIP)

Summary of Projects Funded

1. Pasture School 2007, Lakeland Forage Association

Total ESAIP Funding \$7,200.00

Project description:

Lakeland Agricultural Research Association and Lakeland Forage Association will hold a pasture school series in the summer of 2007. The school will meet one evening a week for six weeks covering topics such as: soil, nutrient and manure management on forages, pasture fertility, grazing basics, pasture watering systems, fencing, riparian health assessment, range assessment, plant ID, and pasture walks.

2. Winter Feeding Day, Lakeland Forage Association

Total ESAIP Funding \$6,900.00

Project description:

Lakeland Forage Association (LFA) and North Peace Applied Research Association (NPARA) will each hold a Winter Feeding Workshop during the winter of 2006/2007. The one day workshop will cover topics such as: winter site selection, winter watering systems, fencing for extended season grazing as well as bale grazing, swath grazing and/or stockpiled grazing demonstrations/tours.

3. Swath Grazing in Northeast Alberta, Lakeland Forage Association

Total ESAIP Funding \$3,900.00

Project description:

As part of providing information on extending the grazing season, LARA has focused research in recent years on swath grazing in Northeast Alberta. In 2006, LARA ran two swath grazing projects, a seeding date trial that compared the yield and quality of four small grain cereals (2 barley, oats, triticale) and corn seeded at seven seeding dates from mid-May until the end of June, and a swath grazing yield and preference test (2 barley, oats, barley and oat mix, Golden German Millet and wheat). The seeding date trial will continue in future years as a means of determining optimum seeding time for small grain cereals when considering yield and quality. However, producers in the area have requested additional information on the affect variety has on suitability for forage production and swath grazing. LARA has received many comments to the effect that it is very difficult to get cattle to eat some varieties of oat and barley straw. In response to these comments and requests LARA would like to conduct two demonstrations on the animal preference for and suitability of different oat and barley varieties for swath grazing. This would be a three year trial that would start in the spring of 2007.

4. Lacombe Pasture School 2007, Grey Wooded Forage Association

Total ESAIP Funding \$25,000.00

1. Project description:

In the past Western Forage & Beef Group together with the Alberta Forage Council offered an advanced level pasture school targeted at producers who already had some background education and experience in sustainable managed grazing. The pasture school, to be held at the Lacombe Research Station in June of 2007 would be targeted at mentors in ARECA's Sustainable Grazing Mentoring Program, members of grazing clubs and experienced grazing managers from across Alberta.

The two day school would consist of a series of presentations followed by moderated discussion/workshop periods. Ample time would be given to these discussion periods to optimize the learning experience of the participants.

5. Soil: Improving the Health of our Soils Sustains the Industry as a Whole, Foothills Forage Association

Total ESAIP Funding \$15,000.00

Project description:

Issue: Soil degradation

Opportunity: To quantify the health of soils where forages are and have been grown. This work has not been done, other than some work on native range at the Stavely sub-station. Discussion with representatives of Alberta Agriculture, Food & Rural Development and Agriculture and Agri Food Canada indicate that the work is required and that FFA should take a lead role in initiating and developing the protocol. These sources have indicated that this research is needed province-wide.

While grazing management is at the heart of the Foothills Forage Association vision of a sustainable agriculture industry and livestock are the end result, nothing is possible without a healthy soil base to work with. The issue addressed in this program is quantifying the amount of organic matter* (carbon) found in similar soil types where forages are grown and managed with varying management practices.

**Organic matter defined as: organic material in various stages of decomposition within the mineral soils.*

The data obtained will be used to educate members and stakeholders in the agriculture industry in Alberta. In this program, Foothills will identify the challenges and begin the process of quantifying the present health of our soils and extend the awareness of the importance of healthy soils.

6. Soils and Crops Diagnostic Field School, Southern Applied Research Association

Total ESAIP Funding \$7,328.00

Project description:

The continuous stream of new information being generated by researchers requires transfer to the end users. A soil and crop diagnostic school will provide information on

agronomic research and impart soil and crop diagnostic skills to industry extension personnel and leading edge producers. This program will enable these individuals to learn up-to-date agronomic information and advanced crop diagnostic skills through the use of hands-on plot demonstrations and virtual classroom instruction from leading agricultural researchers and specialists

The Southern Alberta Soils and Crops Diagnostic Field School used the success of the existing Diagnostic Field School in central Alberta as an indication of the demand for current agronomic information and instruction in timely diagnosing of cropping issues. Because conditions vary widely from region to region within the province and different crops and growing conditions are found in the south, there was limited applicability of much of the information presented in central Alberta to our region. Past success with a Soil and Crop Diagnostic Field School in Lethbridge also indicated there was a need for a “home-grown” product for area agronomists and producers.

7. Establishment of Frost Seeded Legumes on Existing Pasture, Gateway Research Organization

Total ESAIP Funding \$5,400.00

Project description:

This project will be carried out in the GRO heifer pasture. Soil tests have shown that the pasture is perennially deficient of nitrogen, and fertility has traditionally been managed through the use of industrial fertilizer. However, this program is not sustainable as soil tests show deficiencies again the year after application. Cost analysis has also shown that it is not economically viable to apply industrial fertilizer on a yearly basis. Many producers have this same dilemma. Their perceived options are to make do with the poor production, fertilize or work up the field and put in production crops. Neither choice is environmentally or economically sound.

8. Intercropping Winter and Spring Cereals to Extend the Grazing Season, Gateway Research Organization

Total ESAIP Funding \$6,400.00

Project description:

Background: Forage is the most basic requirement of the cattle industry; however with production costs and environmental concerns on the rise Alberta cattlemen need more effective methods of balancing and addressing these factors. Intercropping spring and winter cereals represents a relatively unknown avenue for producing more forage with less impact on the pocketbook or environment. This system involves under-seeding spring cereal silage crops with winter cereals (winter wheat, winter triticale, or fall rye), and allows the producer to harvest a crop up to four times (two mechanically and two grazes) with one pass of the seeding and tilling equipment. The winter cereals also provide leaf material to the silage in year one thereby increasing quality. When the spring cereal has been harvested for silage, the winter cereals will re-grow and can be grazed again before winter. In the spring, these crops can be grazed again before being allowed to go to seed and be harvested for another silage crop. This not only has a very positive

effect on the pocketbook, but the environment as well. Winter cereals prevent erosion in both spring (runoff) and fall (wind), and facilitate insect and disease competition. They begin growth early in the spring, choking out spring-germinating weeds, and herbicide may not be required. Early spring growth and low disturbance also help shelter nesting waterfowl. According to Ducks Unlimited there is a tenfold increase in nesting success in winter wheat compared to spring-seeded cereals, which helps boost declining populations of waterfowl.

9. Winter Wheat as a Viable Crop in West Central Alberta, Gateway Research Organization

Total ESAIP Funding \$2,250.00

Project description:

Background: Winter wheat has great potential for enhancing environmentally sustainable agriculture in central Alberta. It yields more and has better water use efficiency than spring wheat under normal growing conditions. Also, it prevents erosion in both spring (runoff) and fall (wind), and facilitates insect and disease avoidance. Winter wheat begins growth early in the spring, choking out spring-germinating weeds so well that herbicide may not be required, cutting down on costs and preventing over-application of herbicide. In addition, Ducks Unlimited is eager to expand winter wheat acreage because its early spring growth and low disturbance help shelter nesting waterfowl. There is a tenfold increase in nesting success in winter wheat compared to spring-seeded cereals, which will help boost declining populations of waterfowl.

Winter wheat acreage has been growing, with 120,000 acres sown in Alberta in 2005, up from about 50,000 acres in 1999. To help boost the number of acres seeded to winter wheat, the Canadian Wheat Board implemented the Select program, which helps defray costs and market 8 select varieties of winter wheat. However, even with the Select program, the CWB is hoping to further expand its winter wheat market share and compete against hard red winter wheat production in the United States. Winter wheat is a rare crop in west central Alberta, with only 2500 acres seeded in 2001 (2001 Census), even though there are several varieties that grow well in central Alberta. Thus, there is great potential for expansion for this crop.

10. GWFA Entry Level Sustainable Grazing Course 2007, Grey Wooded Forage Association

Total ESAIP Funding \$6,000.00

Project description:

The GWFA Entry Level Sustainable Grazing Course is designed to give the basic principles of sustainable grazing management and an understanding of how to use these principles in developing and implementing their own grazing plans. With these principles, participants can realize sustainable levels of production, economic sustainability of their pasture operation and environmental sustainability of their pastures and riparian areas.

The course is held over a period of two weeks with two evening sessions in each week. This works well for the many potential participants who have day jobs to supplement their farming income.

11. Removing Creeping Red Fescue (CRF) in a Direct Seeding System, Smoky Applied Research and Demonstration Association

Total ESAIP Funding \$18,300.00

Project description:

Background: There are about 280,000 acres of CRF grown in the Peace region and producers are looking for ways to cut costs and produce CRF more efficiently. Between one quarter and one third of CRF acreage is taken out of production each year because it gets sod bound and does not produce optimum seed yield after one “clip year” and one or two seed production years. A portion of that (affected by market influence) is rejuvenated (i.e. ploughed and encouraged to grow back after a break of one year) and between 60,000 and 90,000 acres are returned to annual cropping. Traditionally, CRF has been removed with a combination of several tillage operations that involves a summerfallow year.

12. Effect of Planting Date on Potential of Small Grains for Swath Grazing, Silage and Green Feed, Smoky Applied Research and Demonstration Association

Total ESAIP Funding \$24,712.00

Project description:

Background: Small grains and corn are used for swath grazing to extend the grazing season. Seeding of small grains for swath grazing is generally delayed until late-June so the crop is at the growth stage with best forage quality in September. The crop is then cut prior to or shortly after the first frost. This minimizes the weathering and quality losses of the swathed crop until grazing begins. Same objective can be achieved by seeding corn in spring, due to its longer growing period requirement. However, costs of growing corn are much greater than those of small grains used for swath grazing and silage, which makes it essential that yield and nutritive value of forage corn are high enough to justify high cost of production.

13. The Economic Benefits of Using Compost as a Fertilizer Source in Northern Alberta, Mackenzie Applied Research Association

Total ESAIP Funding \$16,950.00

Project description:

The cost of nitrogen has steadily increased over the past fifteen years. Transportation costs on fertilizer supplies to northern Alberta has left many producers searching for alternate, lower-cost nitrogen sources.

Nutrient management specialists estimate that it may be only twenty years before the supply of natural gas is limited and the price of nitrogen will become too high for economical fertilizer use on farm. Of course, the real financial challenge for producers

has been declining net farm profits from low commodity prices combined with high input costs. In many situations, compost (manure + bulking agent: grass, straw or screenings) provides a lower cost, nutrient-rich organic material that can be used as an alternate source of nitrogen for crop and forage production. Additionally, using materials such as grass clippings in compost may reduce transportation and landfill fees that would otherwise be paid for disposal. Faster application in-field of stock piled manure reduces groundwater and soil contamination from excess nutrient leaching.

Producers in the Peace region question the economic feasibility of compost application. This trial will assess the nutrient value of four compost mixes and evaluate the applicability of compost application in the Peace region.

14. Swath Grazing: Utilizing Different Barley Varieties, Battle River Research Group

Total ESAIP Funding \$3,751.00

Project description:

This project will profile a producer northeast of Strome who is using swath grazing to determine cattle selection and the impacts of swath grazing in his grazing management plan. The producer grew five different varieties of barley within his field and then swathed them in early September. Using observation and nutrient testing, cattle selection will be looked at amongst the five varieties.

15. Soil Management Series, Battle River Research Group

Total ESAIP Funding \$3,100.00

Project description:

- Format: 2 one-day workshops in the late fall or early winter (one in Delburne, one in Galahad) followed by 2 one-day workshops in the late spring/early summer
- Fall/winter workshops would be classroom style with speakers on various soil management topics including soil basics, compost teas, organic farming, and other related topics
- Spring/summer workshops would be field days with outdoor activities including soil testing with the soil test kits available from AAFRD and RTL, proper methods for soil testing, and interpreting soil test results
- The target audience for these workshops is primarily livestock producers – more and more cattlemen/grazers are becoming aware of the role soils play in their operations and require more information to properly manage their soils and subsequently their grazing operations
- Soil is the basis of any ecosystem, we must be aware of it's properties, it's needs, and the management tools available to keep it healthy and productive

16. Red Clover Establishment & Longevity in a Swath Grazing System, Battle River Research Group

Total ESAIP Funding \$1,492.00

Project description:

Red clover is a legume that is grown for its production as a silage, forage, or pasture crop. It can be grown by itself or it can be grown in a cover crop system. It has very quick establishment and can be quite competitive in the sapling stages. Red clover is not very good in drought conditions and sandy soils. Red clover can be susceptible to disease if not managed properly and disease is probably the element that inhibits the production of red clover the most. Cutting the clover early before fall is the best preventative measure to ward off disease. Red clover can be grazed, but in order to maintain a healthy stand of red clover, it can't be grazed for long periods of time. It requires at least 30 days of rest between grazing in order for it to maintain itself for its average life span of 2 to 3 years. It is quite detrimental to graze it heavy, late in the year because it requires time to store enough carbohydrates in its roots to withstand the winter months. The first cut should take place between the time of the first flowers are seen and when 20% of the stems have flowers on them. With red clover, one should not cut after the first killing frost because unlike alfalfa, it will continue to grow and not die back. This will weaken the stand and can be detrimental to the next year's growth.

Red clover is a good alternative to alfalfa when grown within a cover crop such as barley. In this project, the producer will be growing red clover within a barley crop and test to see its success in a swath grazing management plan. Red clover is nitrogen fixing and is quite competitive in its early stages so it should be able to establish with the barley and also be quite productive.

The co-operator on this project has already seeded 200 acres of a red clover, Ranger barley mix to use in his swath grazing rotation this winter. Our methodology would simply include soil testing and feed testing prior to cattle turn out, soil testing following cattle coming off the field, regrowth assessments on the red clover in the spring and summer of 2007 and then a few articles in newsletters and a report within BRRG's 2007 Annual Report.

17. Advanced Trends in Agriculture Tradeshow Open House & Presentations, Battle River Research Group

Total ESAIP Funding \$6,400.00

Project description

- Format for the event: tradeshow open house with presentations throughout the day and an evening supper and speaker
- Day begins with the tradeshow and welcome lunch
- First presentation is a combined Environmental Farm Plan and Canada Alberta Farm Stewardship Program presentation explaining the EFP process and the funds available to farmers who have a completed a deemed appropriate EFP

- Second presentation will look at the issues surrounding farm fuel storage and provide ideas and solutions to address that area of concern
- Third presentation will deal with another area of concern that is regularly identified in EFP's. Issues to choose from include: water, farm septic systems, or riparian areas.
- Fourth presentation will be from a producer who has gone through the EFP process, received a deemed appropriate EFP certificate, has applied to CAFSP, has secured funds from that program and has implemented change on his/her farm
- Open house will run all day and breaks between presentations will be at least ½ hour to allow agricultural producers ample time to network with the tradeshow persons
- Tradeshow open house would include local agribusiness, lending institutions, Rural Extension Staff and Associations (such as applied research associations and the AESA program), AEF, PFRA, Cows & Fish, Reduced Tillage LINKAGES, Ducks Unlimited, Farm Credit Corporation, CCA, CASS and UFA among others
- The evening component of the day is “invitational” for past EFP participants in the Counties of Flagstaff, Paintearth and Stettler who have completed and received a deemed appropriate EFP. This would include a supper and motivational keynote speaker. This is a unique portion of the agenda as it is the first event to target EFP alumni

18. Benefits of Short Term Alfalfa in a Crop Rotation, Battle River Research Group

Total ESAIP Funding \$13,383.00

Project description:

Increasing forage acres together with less tillage has positive environmental impacts; including reduction in soil erosion and an increase in carbon sequestration. Crop rotation studies at Scott, Saskatchewan, have also shown that an extended crop rotation, including hay in the rotation, significantly reduces stinkweed numbers (Brandt et al 1996). As well, a six year rotation including two years of hay dramatically decreased the incidence of blackleg in the canola year. Diversified rotations of cereal, oilseed, forage and pulse crops offer advantages over cereal monoculture. Yields increase, weed and disease control can be improved, and N fertilizer requirements can be reduced over time.

There has been little work in Alberta of the rotational benefits of alfalfa in a crop rotation. Martin Entz from the University of Manitoba reported in a project entitled “Role of Short-Term Alfalfa Stands in Cereal-based Crop Rotations (1995)”, on the feasibility of establishing and removing forages in a zero-tillage system. Under dry conditions (<15mm of precipitation 40 days after seeding) establishment of alfalfa was higher under zero till as compared to conventional tillage. Herbicides have also proved to be effective in terminating alfalfa stands. In this study, fall applied Roundup in combination with Banvel, 2,4-D or Lontrel on alfalfa regrowth was very effective. In one study where alfalfa was terminated in this manner, the following wheat crop yielded 60 bushels/acre compared to 46 bushels/acre in the tillage treatment. The weed suppressing

attributes of alfalfa were also observed in the rotation trial near Portage la Prairie, Manitoba. Wheat following two years of alfalfa had fewer annual and perennial weeds than wheat after barley. In 1992, the weed suppressing effect of the forage was enough to eliminate the need for a broadleaf herbicide application. Herbicide resistance is also a growing issue in crop production with the over reliance on Group 1 and Group 2 herbicides. Including a forage crop in a rotation would also give a break from herbicide use.

19. The Effect on Forage Yields When Intercropped with Trees, North Peace Applied Research Association

Total ESAIP Funding \$6,025.00

Project description:

In the grey wooded soil zone of Northern Alberta, trees are a very common part of the landscape. For years people have been utilizing the trees in their pasture as wind breaks or shade for livestock. There are many more environmental benefits to having trees on your agricultural land; carbon sequestration, the ability of trees to trap snow for moisture, and the decrease in the evapotranspiration rate. It is stated that wheat will have a higher yield when grown across from a shelterbelt of trees (<http://www.agr.gc.ca/pfra/shelterbelt/shbpub10.htm>). Since forages and trees have such a symbiotic relationship, we are looking to see if hay yields increase when grown across from trees.

20. Nutrient Management Practices in Agriculture, North Peace Applied Research Association

Total ESAIP Funding \$11,587.00

Project description:

Background

Optimal nutrient management and balanced fertility is a key component in being a successful producer and growing high yielding crops and forages. Very easily this finely tuned symbiotic system can come unraveled and yields drop, soil becomes robbed and the environment is at risk. Performing a test on your soil, and manure can be economically beneficial to your operation as well as environmentally beneficial. Many producers have heard local companies recommend a soil test prior to seeding, or testing their manure to know the nutrient content. The problem is these aren't practices that most producers in the area follow. Some people put on a blanket application of fertilizer around their whole farm- even though different crops have different nutrient uptakes, this will lead to some fertilizer being underutilized and left in the environment. In many cases animal manure gets applied to the field closest to the corrals, year after year, even though producers have no idea what nutrients are in the manure they are applying, and what nutrients are currently in the soil.

To eradicate these actions we need to educate and inform producers about the economic benefits in knowing what nutrients your soil has, knowing what nutrients are taken up by your plants, and knowing what nutrients are in you application of manure.

21. Energy Use on the Farm Workshop Series, Agricultural Research and Extension Council of Alberta

Total ESAIP Funding \$45,000

Project description:

Background

There is increasing interest in strategies to reduce energy use on the farm. Producers face rising energy costs not only in their homes as do their urban cousins, but in heating and electricity for farm buildings, and powering farm machinery and operations. Farmers may be able to take advantage of more strategies than urban residents due to their larger land base, potential alternative energy stocks, and economy of scale.

This is a rapidly changing field, and a series of workshops featuring key speakers in their respective energy-related fields would be an ideal method of spreading awareness of strategies and ideas for energy reduction. The workshops would include speakers on topics such as solar heating and power, geothermal heating, capture of methane for power generation, production of biodiesel, and burning of alternate fuels such as grain etc.

In April 2006, the Battle River Research Group held an Energy Reduction meeting in Forestburg, with sessions on energy audits in the home, solar heating and power, grain burning stoves, and geothermal heating. This highly popular meeting was well received, despite limited resource. A series of workshops spread throughout the province would attract top speakers and gain a higher profile and more awareness.

Workshops

ARECA member Associations would host a travelling roadshow series of workshops. The same (or similar) workshop would be held at several venues throughout Alberta, likely in the space of one work week. A core group of speakers would present at each workshop, with a few local speakers at each event.

22. Year Round Grazing Handbooks, Peace Country Beef & Forage Association

Total ESAIP Funding \$6,000.00

Project description:

Over the past decade, a significant amount of research, demonstration, and extension has been done on different beneficial management practices (BMPs) that can extend the grazing season. These practices include improved management of perennial forage stands, stockpiling perennials and annuals for fall grazing, swath-grazing, and bale-grazing. The different practices have been demonstrated individually at all times of the fall and winter, and under all degrees of weather conditions. However, very little work has been done to assist producers in putting together a grazing plan that encompasses all of the different practices mentioned into a comprehensive year-round grazing plan. While these BMPs on their own are proven, the idea of putting them together has only been discussed as an extreme concept.

The demonstration of this concept has become a reality. The five demonstrations at the various sites across the province were completed on February 28, 2006. In order to

achieve the highest level of effectiveness, it is essential that the Year Round Grazing systems are demonstrated over a 365 day period. A producer handbook highlighting the 5 cooperating producers and collaborating their data needs to be developed in order to demonstrate the benefits of such a concept. This handbook will emphasize the key points such as economics, varietal type, bale grazing, swath grazing, stockpiled forage, aftermath, etc, watering, fencing and other critical factors when considering these systems. The handbook will reach producers all across the province, and will be developed by the partners listed above. The handbook will be available in a producer friendly format, with stories, pictures and helpful tips. It will be showcased at the Western Canadian Grazing Conference on December 6 – 8, 2006 in Edmonton. It will then be available across the province and will be distributed through various channels.

23. Beaver Creek Watershed Health Evaluation Project, Beaver Creek Watershed Group

Total ESAIP Funding \$32,174.00

Project description:

The group wishes to continue monitoring water quality in 2007 to complete a five-year data set and to identify and implement further BMP projects that will maintain or improve water quality in the basin. Alberta Agriculture will continue to provide support for nutrient analysis and flow monitoring. The group would also like to complete fish surveys in the creek. Although Beaver Creek provides important fish habitat there is little to no data regarding fish populations in the creek. The group feels that establishment of baseline fish population data will be important for future reference. Alberta Conservation Association will complete these fish surveys. The group also feels there is value in re-assessing riparian health in the basin. By repeating the riparian health inventories done by Cows and Fish six years ago, the data can be used to evaluate the effectiveness of the BMP projects, aid in the interpretation of the five-year water quality data set and provide insight into the fish survey results. We feel there is great benefit in working together to merge these projects and interpret each data set in relation to the others, as they are inter-connected. We feel this partnership will add value to all the data collected.

24. Alberta Stewardship Network Stewardship Showcase, Alberta Stewardship Network

Total ESAIP Funding \$2,500.00

Project description:

Fifteen successful stewardship projects will be profiled in an extension document / booklet from across five categories (Awareness & Knowledge, Tool-Building, Team-Building, Biophysical & Social Monitoring, and Community-based Action). Stewardship projects will be from across Alberta and will include all types of stewardship projects.

Example stewardship projects selected to profile include:

- Iron Creek Watershed Improvement Society – Riparian Health Inventory Monitoring
- Beaver Creek Watershed Group – Water Quality Monitoring Program

- Pincher Creek Watershed Group – Blueweed Blitz (annual weed pull)
- Branches and Banks – annual urban tree planting event in Cochrane
- Lac La Nonne Enhancement and Protection Society – Riparian Improvement Project (agricultural demonstration sites)

Case study profiles will be written based on interviews with stewardship groups and individuals, thereby capturing local knowledge.

25. Field Monitoring for Early Detection of Glyphosate Resistance, Alberta Research Council

Total ESAIP Funding \$37,000.00

Project description:

Rationale: The availability of cheap and effective glyphosate is a cornerstone of reduced tillage production in Alberta. Glyphosate is also recognized as a relatively benign herbicide. Reducing tillage has a number of environmental benefits (see section on Environmental Benefits). The risk of glyphosate resistance in weeds is considered fairly small in western Canada. Where resistance has occurred, it has occurred where multiple applications of glyphosate occur in a single and on weeds that predominantly outcross. While the risk is low, the consequences of glyphosate resistance are substantial.

- There is no economical and effective substitute. The use of bleaching herbicides (e.g. glufosinate, paraquat, diquat) are less effective than glyphosate for some weeds and are considerably more expensive. Other herbicides, such as amitrol and 2,4-D are also less effective but have residual activity limiting the crops they can be used in.
- Since there is no economical and effective substitute, the cost of farming will be substantially increased if glyphosate resistance is not detected early and steps taken to remediate the problem.

Action Plan

- Identify risk factors for glyphosate resistance
- Design questionnaire
- Disseminate to producers
- Rank fields according to risk and decide which fields to survey
- Obtain permissions to scout fields after glyphosate applications
- Post-herbicide application field scouting
- If resistant plants are detected, determine if progeny are resistant
- Disseminate results

26. An Evaluation of the Extent of Occurrence of the Herbicide Glyphosate in Alberta's Agricultural Streams, Reduced Tillage LINKAGES

Total ESAIP Funding \$30,000.00

Project description:

Reduced Tillage LINKAGES is proposing to partner with the Alberta Environmentally Sustainable Agriculture (AESA) Water Quality Monitoring Program (AESA Stream Survey) and the provincial Watershed Planning and Advisory Councils (WPACs) to conduct an evaluation of the extent of occurrence of the herbicide glyphosate in surface waters in Alberta's agricultural region, and to extend this information to the agricultural producers and residents living in the watersheds of study. Glyphosate has been identified as a priority for monitoring by the Bow River Basin Council.

27. Comparing Cereal Crop Harvesting Systems, Central Peace Conservation Society

Total ESAIP Funding \$4,600.00

Project description:

The object of this project is to evaluate the economic and environmental returns when using a stripper header to harvest cereal crops as compared to the use of a conventional straight cut header.

28. Manure Nutrient Management, Southern Applied Research Association

Total ESAIP Funding \$36,901.00

Project Description

Winter feeding is the greatest single cost to cattle production systems in Alberta. At great expense huge amount of nutrients are collected and fed and it is little known to producers that the animals only use 10 to 20% of what is in the feed. Once excreted these nutrients are commonly subject to rapid loss and following contamination of the environment. As one example nitrogen volatilized from feedlots and drifting in the atmosphere has caused nearby soil N levels to increase by as much as 100 lbs/acre. Different feeding/manure management methods exist to minimize the loss of these nutrients through better manure management however a study has never been done on how efficiencies vary between the systems. It would be of great value to monitor farms and ranches to quantify the nutrient efficiencies of these systems.

29. Pea Leaf Weevil Trap Cropping, Southern Applied Research Association

Total ESAIP Funding \$15,900.00

Project Description:

Pea leaf weevils are a new pest to the province, one that has spread from the Pacific Northwest into southern Alberta within the last two years. Economic damage occurs in the spring from the weevils eating the seedling leaves and later in the year from the larvae of the weevils eating the nitrogen producing nodules of the plant. The scale of economic damage is still in the process of being assessed, but has been judged as being potentially disastrous to the growing of peas in the south of the province.

30. Analysis of Organic Horticultural Pest Prevention Methods, Lakeland Agricultural Research Association

Total ESAIP Funding \$1,800.00

Project description:

Organic produce consumption in Alberta is over \$3 billion per year, and continues to grow at a rate of 15 to 20% per year. Pest control is an issue, and there is a lack of good scientific data around organic pest prevention, but there are problems with setting up statistically valid scientific research trials.

This project proposes to start with observing the impact of imported cabbage moth larvae on cuciferous plants. These green caterpillar-like larvae can devastate cabbage, cauliflower and other plants from this family. Some of the organic control methods that exist are cumbersome, difficult or time consuming. This trial will compare new control methods to these existing ones and conventional production in a scientific, replicated manner. In future years we will consider other organic means of pest control and other crops.

31. Management Intensive Grazing (MIG) of Riparian Pastures, Peace Country Beef and Forage Association

Total ESAIP Funding \$19,600.00

Project description:

The majority of the research literature shows that totally excluding livestock from streams is the most acceptable best management practice to follow. In reality, this practice is seldom followed because of the high cost of fencing streams and riparian areas, as well as the mindset that you are losing grazing acres. In some livestock grazing areas, the riparian zone has been grazed for decades without excluding livestock. Most of the natural buffers in these riparian zones have been converted to grass and legume pastures.

With so much emphasis being placed on fencing off your riparian areas to keep livestock out, a lot of knowledge is being lost on how to properly manage those riparian areas. The PCBFA would like to show producers an alternative to fencing off riparian pastures, proper rotational grazing. With good management and timing you can effectively graze riparian areas. In turn producers are not losing grazing acres but instead increasing lbs of available forage per acre. The riparian area itself still needs to be properly maintained and timely grazing is an effective way to sustain these delicate areas.

The project will include 3 sites:

- 1) A producer who has an established riparian area fenced off for 8-10 years, where vegetation is plentiful,
- 2) An area where the riparian area is newly rejuvenated 3-5 years,
- 3) An area where there is no riparian management.

Year 1

- To monitor each site in the spring, summer and fall to get accurate yield estimates and measurements using a GPS hand held reader, number of acres, riparian health assessments, establish grazing plans.

Year 2

- Carry out grazing management plans, allow cattle to graze in each riparian area for a period of time, complete a riparian health assessment on each site, record accurate measurements on yields and lbs gained.

Year 3

- Monitor impact from grazing in the riparian areas with health assessment and lbs. gained per acre grazed. Follow up with producers in forthcoming years and monitor the change and measure the adoption rate from other producers.

32. Crop Rotation Studies, Chinook Applied Research Association

Total ESAIP Funding \$24,260.00

Project description:

Cereal production has traditionally dominated the east central region of Alberta, most commonly in either a fallow-cereal or fallow-cereal-cereal rotation. An increase in field pea acreage has occurred during the past several years. Acreage in oilseed production has been limited, with an increase in mustard in recent years. Many producers are experimenting with crop sequencing when incorporating these crops, trying to maximize fertility, weed control and economics.

To address these issues, crop rotation studies were designed to compare various combinations of cereals, field peas and canola. Crop yield and quality, the impact on soil fertility, management of weeds and economics are all monitored. One such study was established in Special Area 2 in 1999 and a second in the MD of Acadia in 2005.

Eight 3 year rotations are present in the trials, including a cereal, oilseed and/or pulse crop, in either a continuous cropping or chem-fallow cropping system. Winter wheat is included in the MD study.

33. Shelterbelt Nursery Project, Chinook Applied Research Association

Total ESAIP Funding \$24,260.00

Project description:

Shelterbelts established on farms and within farmyards serve a number of purposes, including enhancement of snow trap, wind management, wildlife habitat and as well as aesthetics. Species selection can be challenging in the semi-arid area of east central Alberta. Planting and maintenance techniques which are successful in many other areas of the province may not necessarily achieve success here. The nature of tree and shrub growth requires long term commitment, so any tools which may improve the odds of successful establishment are valuable.

This project includes demonstration of tree and shrub species as well as weed control and irrigation techniques. A number of species (green ash, Colorado spruce, Manitoba maple,

chokecherry, lilac, hawthorn, sea buckthorn and silver buffalo-berry), were planted in 2004 at the CARA Center, Oyen, with assistance from PFRA. Drip tape irrigation, fed by water collected from equipment storage building runoff, and plastic mulch system was installed. Several local producers have incorporated similar systems. Organized and self-guided tours are held at the CARA site.

34. Use of Compost for Cropland Reclamation, Chinook Applied Research Association

Total ESAIP Funding \$24,180.00

Project description:

The Special Areas and MD of Acadia lie within the semi-arid, brown soil zone of east central Alberta. The majority of the soil is classified as a Class 4, with low fertility levels, erosion issues, and areas of saline and solonchic soils. Cropping systems in east central Alberta have traditionally been in a cereal crop-fallow rotation, with limited use of fertilizer. Many producers run mixed operations, i.e. raise cattle in addition to crops.

Applied Research Component (2007)

A site for a replicated small plot study will examine various treatments of compost, raw manure and chemical fertilizer. Crop yield, crop quality and soil quality parameters will be monitored for three years. The entire project will be duplicated at a second site in 2008 to provide additional crop-years of data.

Field Scale Demonstration Component (2007)

A. Composted feedlot manure will be broadcast in strips at 2 sites in the spring of 2007. A complete nutritive analysis will be carried out on all treatments prior to application. The effect of the treatments on crop yield, grain quality, and changes in soil parameters will be monitored for three years.

B. Composted feedlot manure will be spread at a third site, which will also include a treatment of composted barnyard manure (using primitive composting techniques). A complete nutritive analysis will be carried out on all treatments prior to application. The effect of the treatments on crop yield, grain quality, and changes in soil parameters will be monitored for three years.

35. Perennial Forage Establishment and Evaluation, Chinook Applied Research Association

Total ESAIP Funding \$15,145.00

Project description:

Perennial forages make up a significant part of the annual feed supply for area cattle producers. They are also becoming more and more of a cash crop for farmers. Variety selection and establishment can be a challenge in the semi-arid environment of east central Alberta.

This project is designed to evaluate a number of perennial forages (alfalfa and grass species) at 3 different sites in the Special Areas. All 3 sites will have field size demonstration strips of selected varieties, and small, plot replicated trials will be located at two of them. The species chosen for the project include some forages that have been available for many years, and have shown adaptation to this area. Some new varieties are also included to determine if they have a fit in east central Alberta.

36. Sustainable Grazing Mentorship Program, Agricultural Research and Extension Council of Alberta

Total ESAIP Funding \$60,000.00

Project description:

ARECA's *Sustainable Grazing Mentorship Program* assists producers in improving the sustainability of their forage operations. This program has been so successful, that in 2006, ARECA received funding from AAFC to take the program nationwide and to train mentors across Canada. Several organizations have funded this program in the past, including PFRA, the Rural Water Development Fund and the Greenhouse Gas Mitigation Program.

This is a client-focused and client-owned, results-oriented extension and technical transfer program. Experienced graziers (mentors) work directly with less experienced graziers (clients) for approximately 16 hours, to develop a grazing plan tailored to the needs of the client. This program utilizes an interactive approach, which takes place at the client's farm, with the client's input. It is an opportunity for grazer clients to experience one-on-one, interactive information transfer through the mentoring process, in order to improve pasture management. This program provides support for producers genuinely interested in pasture improvement, and demonstrates to them the value of properly managed pasture. As well, other extension related activities, such as meetings, conferences, workshops, newsletters, etc. will inform a wider audience about the benefits of BMPs, carbon sequestration, and greenhouse gas mitigation, and encourage adoption of better practices.

37. Integrating Cattle Grazing & Timber Production, West Central Forage Association

Total ESAIP Funding \$7,500.00

Project description:

This project was designed to determine the potential effects of cattle grazing on deciduous forest regeneration following standard clear-cutting practices in the west-central area of Alberta. The project will provide information on the effects of a two deferred year fall grazing program at two different cattle stocking rates and on two ecologically different winter-harvested (winter 2005-2006) deciduous blocks in the lower Foothills of west-central Alberta.

The project involves the fencing of two exclusion blocks (completed - spring 2006). Cattle will be excluded from these blocks until the fall (late August – early September

2007) in the meantime the WCFA will monitor precipitation, collect and prepare forage clippings for analysis as well as provide the project cooperators (Claypools) with routine range and stock management.

The project will also incorporate new approaches to logging slash disposal; specifically, logging slash will be used to create barriers that discourage cattle from concentrating along roads and landings and more even grazing across the entire harvested area.

38. Cows & Fish Workshop – 2007, West Central Forage Association

Total ESAIP Funding \$2,490.00

Project description:

Beef production is the primary source of agricultural revenue in the WCFA area, with that in mind we have identified good pasture and range management as being an integral part of environmentally sustainable agriculture. We have also recognized that riparian areas can and do supply much of the available forage in a pasture or range. This abundant forage naturally attracts cattle and wildlife and also creates ideal resting areas. As result these riparian areas are often mismanaged and overgrazed which ultimately leads to the degradation of these ecologically sensitive areas. The damage to the environment includes: the loss of wildlife habitat, stream bank destruction, soil erosion, the creation of ideal conditions for the establishment of invasive weed species, the lack of tree/shrub cover leads to water temperature fluctuations and massive algae blooms just to name a few of the negative effects to the environment.

The WCFA believes that a key element of good pasture/range management is acknowledging the fact that these areas are ecologically sensitive and need to be managed differently from the rest of the pasture or range. We aim to educate local producers on the importance of proper riparian area management by hosting a two part Cows & Fish workshop over the summer of 2007. Working with the Alberta Riparian Habitat Management Society and our key partner the West Central Conservation Group the WCFA will host a one day ‘inside workshop’ followed up with a one day hands on ‘outside workshop.’

39. Cowbytes Training Workshops, West Central Forage Association

Total ESAIP Funding \$7,006.00

Project description

In the past (2004 & 2005) the West Central Forage Association has conducted several Cowbytes software training workshops in cooperation with our local county staff, Alberta Agriculture and the Canadian Cattleman’s Association – Greenhouse Gas Mitigation Program. The Cowbytes software program was developed by Alberta Agriculture and Food to provide cattle producers a quick and relatively user friendly method of balancing cattle rations. The software uses the 1996 National Research Council beef formulas to meet the nutritional needs of beef cattle.

The results of a recent survey of WCFA members indicate that there is considerable interest in hosting another series of workshops. The WCFA proposes to host two workshops per year – a fall workshop and a winter workshop. Our plan is to travel with these workshops to the major population centers within our partner counties. (Parkland, Yellowhead, Brazeau, Lac Ste. Anne counties) The workshops will be kept relatively small – 10 people max to ensure that each participant receives individual attention. This small class size will also enable the WCFA to secure enough computer space from our local schools and community based continuing education societies. Additionally, by conducting multiple seminars held in different locations, the WCFA aims to reach a larger audience and provide producers with alternative dates for attendance.

In addition to providing instruction on the use of Cowbytes the WCFA will use the workshops to promote related topics such as the benefits of: swath grazing, Best Management Practices related to grazing, alternative crops for extended grazing seasons and the importance of feed analysis. Producers will be encouraged to submit actual feed samples from their farm operations for analysis in advance of the workshop(s). It is our belief that not only will our local membership benefit from improved feeding practices and a better understanding of large animal nutrition, but ultimately the WCFA area environment will benefit from the adoption of Best Management Practices such as feeding balances rations.

40. Control and biology of emerging invasive weeds: scentless chamomile, white cockle, and narrow-leaved hawk's-beard, Alberta Research Council

Total ESAIP Funding \$18,500.00

Project description:

Winter annual, biennial and perennial species are becoming harder to control as adoption of direct seeding increases. As more weeds become problematic in direct seeding systems, the adoption and sustainability of direct seeding will decline. Scentless chamomile, narrow-leaved hawk's-beard, white cockle are all introduced, highly invasive weeds that can cause significant yield losses in crops.

This project will determine the potential effects of time of emergence on growth, development, and seed yield. Data collection will include: emergence, rate of growth, biomass, seed yield, soil moisture, and soil temperature.

41. Optimizing Evaluation of Competitive Ability in the Regional Variety Trials, Alberta Research Council

Total ESAIP Funding \$25,000.00

Project description:

Rationale: Barley is a competitive crop with potential to be a valuable Integrated Weed Management (IWM) tool. European research has demonstrated reduced herbicide rates are effective when competitive barley cultivars are used (Christensen 1995). Barley is not uniformly competitive and substantial differences in cultivar competitive ability exist. In a trial intended to incur 25% yield loss, actual yield losses ranged from approximately

8-80% (Watson et al. 2006). They also measured % dockage as a competitive ensure and found it was not always well-correlated with yield loss. They concluded that to maximize the competitive effects of barley cultivar competitive ability, rankings for both components of competitive ability would be useful to producers. Preliminary research in progress at the ARC indicates that adding competitive ability to Regional Variety Trials is feasible at minimal additional cost. However, important constraints on adding competitive ability are: 1) plot size, 2) choice of weed, and 3) method of enumerating components of competitive ability and, 4) optimal weed and crop density.

This portion of the project is intended to add additional site for funding requested from Advancing Canadian Agriculture and Agri-Food. Additional sites will enhance data thereby adding to our ability to generalize on the project utility over a wider geographic scale.

42. Parkland Conservation Farm Beneficial Management Practices Demonstration Site, Parkland Conservation Farm

Total ESAIP Funding \$27,950.00

Project description:

This project will assist with the implementation, maintenance and touring of BMP Demonstrations including: manure treatment and land application, alternative water systems, cross fencing, fuel storage, manure storage and a mobile water system. This will help to provide producers with current information on the status of the AEFPP, possible funding options available in the area through the CAFSP, and procedures that must be followed in order to fill out the applications. The ultimate goal is to increase producer awareness of what may be accomplished given the proper knowledge, and to prove that farming can be both profitable and environmentally sustainable.

43. Pasture School Series, Peace Country Beef and Forage Association

Total ESAIP Funding \$6,625.00

Project description:

The majority of the research literature shows that properly managing your pastures is the most acceptable best management practice to follow. In reality, this practice is not always adhered to because of the lack of time, money, knowledge and confidence in producers. There are many extra costs associated with proper grazing management and there is a stigma that it doesn't pay to intensively manage your pastures.

With so much emphasis being placed on intensively managing your pastures, a lot of producers are not managing at all. The cost associated with pasture schools deters many producers from attending. The pasture school series would be developed to show producers how to maximize profit and environmental sustainability. Each co-operator will organize a pasture school in their area and attract the local producers. Steve Kenyon will be the guest speaker at each workshop and will shed some new light and ideas in the Peace Region. There will be 5 one day courses, covering topics such as: soil, nutrient and manure management on forages, pasture fertility, grazing basics, pasture watering

systems, fencing, riparian health assessment, range assessment, plant ID, and pasture walks.

44. Evaluation of Manure Management on Crop Yields, Quality and Economics, County of Two Hills No. 21

Total ESAIP Funding \$3,210.00

Project description:

Livestock manure is a great resource for crops as it contains nutrients, can improve soil tilth, structure, and water-holding capacity. However, proper manure management is an important topic because of its environmental concerns. Thus, in order for producers to properly manage their livestock's manure on crops, producers need BMP (beneficial management practice) information about the proper application rate and what the effects of manure application and treatment would have on crop quality, yield, and economics. While much is known about the effects of applying cattle manure on crop land, little is known about the effects of applying and economics are of anaerobically digested manure on crop land and how digested manure compares against fresh cattle manure and commercial fertilizers.

Therefore this project will evaluate and demonstrate manure management effects on crop quality and yields by having at least one demonstration site on cropland with the following treatments:

1. Check (no manure-just commercial fertilizers);
2. Fresh cattle manure at low spreader speed (will measure when spreading the application rate for all treatments);
3. Fresh cattle manure at a greater spreader speed than in treatment 2;
4. Anaerobically digested cattle manure (from the Integrated Manure Utilization System digester at Highland Feeders which is near Hairy Hill, AB.) at a low spreader speed;
5. Anaerobically digested cattle manure (from the IMUS digester at Highland Feeders which is near Hairy Hill, AB.) at a greater spreader speed than in treatment 4.

Half of each manure treated plot will then be incorporated and the other half will not be incorporated. The manure would be applied just before the crop is seeded. Later before crop harvest, a BMP field day and tour for producers will occur, which would showcase this site's results. It is hoped to evaluate these two manure sources on both a cereal crop and on a canola crop.

45. Pulse Crops and Crop Rotation Benefits for a Cereal Crop, Battle River Research Group

Total ESAIP Funding \$22,500.00

Project description:

Integrated nutrient management (INM) refers to the efficient use of available nutrient sources to maintain a viable nutrient balance on the farm. The adoption of field peas has declined in recent years, largely due to short term economics. Many producers are switching to short term rotations concentrating on wheat and canola. These rotations in the long term could lead to increasing risk of canola diseases such as blackleg,

sclerotinia, clubroot, and foliar and root diseases of wheat. Also, input costs have also greatly increased in recent years. Adding nitrogen to the soil by the growing of pulses is a viable strategy to help alleviate these rising costs.

In order to promote the inclusion of pulse crops in a crop rotation, this project will demonstrate the economic and environmental benefits through a series of demonstrations that evaluate pulse crops in a short term. Results from these demonstrations would assist in an extension program to promote the uses of pulse crops, and their associated environmental benefits.

This project will demonstrate the benefits of including pulses and other crops in a crop rotation, compared to a rotation including wheat and canola only. It will: 1) compare two different pulse crops to an oilseed crop and a non-wheat cereal, and evaluate the effect in reducing nitrogen use in a crop rotation; 2) measure Nitrogen benefit with other methods such as soil tests, nitrogen probes, and the benefit on the following wheat crop in terms of protein and yield; 3) compare high vs low fertility regimes in year two, in order to document if nitrogen fertilizer rate reduction is viable; and 4) compare the economic return of the rotations.

46. Biological Control Strategies for Foxtail Barley Control, Chinook Applied Research Association

Total ESAIP Funding \$15,010.00

Project description:

Many producers across the prairies are looking for ways to control foxtail barley. This invasive plant has long been a problem in saline and waste areas, but is showing up more and more in cultivated areas as less tillage is used for weed control. It adversely impacts grazing potential and feed quality in pasture or hay-land areas, and requires an aggressive approach with herbicides in an annual cropping system. The weed can also affect animal performance because of injuries from the sharp awns. Effective, low cost control measures using less chemical are long overdue.

One of the most cost-effective, environmentally friendly methods of controlling foxtail barley will be to replace or out-compete it, with perennial forage species. Preliminary trials conducted in Saskatchewan indicate a variety of green wheatgrass, AC Saltlander, demonstrates potential to suppress foxtail barley growth in saline affected soil.

This multi-agency project is designed to further evaluate the AC Saltlander green wheatgrass, plus a number of other perennial forages, which show sufficient salinity tolerance and the hardiness to compete with the foxtail barley. The other varieties to be included are Orbit tall wheat grass, AC Polar northern wheatgrass, AC Rocket smooth brome, AC Poole western wheatgrass, Nuttals salt meadow grass, common slender wheatgrass, Spredor 4 alfalfa and Proven Seed's Saltmaster mix. Three sites of the trial (Swift Current, Warner and Special Area 3) will ensure results are applicable to different growing conditions with varying salinity levels and an adjacent seed source of foxtail barley. Establishment, growth and productivity of the forage species will be evaluated in

small plots of known levels of saline concentration at each of the three sites. Samples will be collected from the Special Area 3 site for analysis of feed quality. A palatability trial of selected species will be conducted using live animals by AAFC at Swift Current.

Results from the trials will be compiled and made available to producers via written reports, newsletters, news releases, poster presentations, field days, tours and seminars. The Special Area 3 site will be included in CARA's Summer Project Tour in July 2007.

47. Collation and web-ready publication of collected information on blossom blight of alfalfa, Agriculture and Agri-Food Canada

Total ESAIP Funding \$10,000.00

Project description:

Blossom blight of alfalfa (caused by *Botrytis cinerea* and *Sclerotinia sclerotiorum*) was first reported in alfalfa seed production in Canada in 1993 [1]. Even though this is the first time it had been reported, it had clearly been established for a long time, because it occurred throughout the region, from the Peace River region to the irrigated fields of southern Alberta, and across the prairies into Manitoba. Co-operative studies that involved grower groups, Alberta Agric., Manitoba Agric., university and federal research scientists were conducted from 1995 – 2001 [2, 3], and continue on a smaller scale to the present. The studies focused on disease surveys to determine the extent of the problem, methods for disease detection and development of thresholds for management actions (e.g. [4]), and fungicide trials to assess efficacy and timing. However, the results of these many different trials have not been consolidated and published, and are not readily available to extension specialists or producers.

An assistant is needed each year to participate in collecting, consolidating and validating the data; data manipulation, analysis, and summaries (standard statistics and GIS assessments); production of tables and graphics; and development of text and for the scientific publications, the website, and other written materials.

48. Validation of a non-toxic insect control formulation, SafeSolutions Inc.

Total ESAIP Funding \$10,000.00

Project description:

This project will determine the efficacy of a novel, non-toxic formulation against insect and/or mites causing economic loss in Alberta's agriculture industry. Target pests include: cabbage moth (larvae), a pest on horticultural crops; *Delia radicum* (adults), a pest on canola and horticultural crops; and lygus bugs (adults and nymphs), a pest on canola.