



Manitoba Sustainable Agriculture Practices Program Beneficial Management Practices Catalogue



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Cost-Share Opportunities for Manitoba Agricultural Producers to Implement Beneficial Management Practices (BMPs) Related to Climate Change Mitigation and Adaptation

Climate change is related to increasing atmospheric concentrations of greenhouse gases (GHG), such as nitrous oxide (N₂O), methane (CH₄) and carbon dioxide (CO₂). Manitoba has a limited impact on national GHG emissions, but may be significantly impacted by climate change.

Manitoba has been recognized as a leader for action on climate change. The province is strongly committed to reduce GHG emissions by 3 megatonnes of CO₂ equivalent by 2012. Manitoba's GHG emissions sources are different from other provinces, in that agriculture is responsible for a greater proportion of total emissions: agriculture contributes approximately one-third of Manitoba's GHG emissions.

The increasing global demand for food and other agricultural products and higher environmental standards have combined to influence agricultural practices. The trend is toward more ecologically sound and energy efficient agricultural practices. Industry, government and scientists have examined current agricultural management strategies in detail. Their common goal is to reduce GHG emissions through more efficient use of fertilizer, increased sequestration of carbon in agricultural soils and improved livestock production and manure management.

What is the Manitoba Sustainable Agriculture Practices Program?

Manitoba Agriculture, Food and Rural Initiatives (MAFRI) has developed the Manitoba Sustainable Agriculture Practices Program (MSAPP) to help producers reduce agricultural GHG emissions. Reaching this goal will help the province achieve its climate change objectives and become a low-carbon, green economy. MSAPP has three main objectives:

- to provide a technical and financial BMP incentive program
- to fund research and development to build capacity for enhanced mitigation, sequestration and adaptation, before and beyond 2012 in the agriculture sector
- to provide extension activities that assist producers in adopting agricultural practices that reduce GHG emissions

Farming practices with the potential to reduce GHG emissions were assessed by agriculture industry representatives, agricultural science researchers and MAFRI specialists. The BMPs selected showed the most potential to reduce GHG emissions and had the highest likelihood of being adopted by Manitoba's producers.

MSAPP will help farmers adopt BMPs that achieve GHG reductions, along with other benefits including improved water quality, reduced production costs and improved rural economic development. In addition to the environmental and economic benefits, selected BMPs will increase resiliency on farms. This means rural communities will be more prepared to adapt to anticipated climate change effects, including unpredictable and extreme weather, longer and more frequent droughts, as well as pest infestations.

MSAPP is an innovative approach to funding agricultural-based GHG reduction projects. It is important, however, that the MSAPP be integrated as much as possible with other GHG reduction strategies across Canada. This will ensure sustainable, long term reductions in GHG emissions.

How does the Manitoba Sustainable Agriculture Practices Program work?

You first need to complete an Environmental Farm Plan (EFP), then arrange a review of your workbook with a Keystone Agricultural Producers (KAP) representative to receive a Statement of Completion. Once you have the statement, you are eligible to apply for funding through MSAPP to reduce environmental risks on your farm. You will need to attach a copy of your Statement of Completion to your application form.

This catalogue lists the BMP categories, practices, cost-shared funding levels in Manitoba and eligibility details. For each category, limits on the funding cost-share are indicated, as is the maximum amount of funding available through the program for each farm operation. The maximum amount payable to one farm operation under the MSAPP is \$100,000.

Approval from MAFRI must be in place before implementing your project. This program is not retroactive.

How to Apply

MSAPP provides eligible Manitoba producers with financial and technical assistance to:

- Reduce farm GHG emissions
- Reduce identified environmental risks to soil, water and air quality
- Enhance biodiversity and natural habitat

With an approved EFP, you can apply for funding to initiate farm practices that reduce greenhouse gas production from your farm.

Step 1: Complete a Manitoba Environmental Farm Plan.

MAFRI offers a voluntary, confidential self-assessment process to increase awareness of farm practices and environmental sustainability. The process helps producers develop and implement an action plan and provides tools for developing and implementing the EFP.

Producers must participate in a series of two EFP workshops delivered by MAFRI. After completion of the workshops, the producer's EFP workbook is reviewed and a Statement of Completion certificate is issued. The statement is valid for five years from the date of issue. Workshops are available throughout Manitoba. Contact your local Growing Opportunities (GO) Office for workshops to be held in your area.

Step 2: Apply for MSAPP funds to help implement your Environmental Farm Plan.

Producers who have completed plans, had them reviewed and have received a Statement of Completion are eligible to apply to MSAPP. The program offers incentives to support the implementation of BMPs to reduce GHG emissions on farm.

See the general program information for details on the application process, the available programs that provide funding and the funding process.

For more information on MSAPP

Contact your local MAFRI GO Office or Centre; call Manitoba Government Inquiry, toll free, 1-866-626-4862 to find the nearest GO Office or Centre; or visit www.manitoba.ca/agriculture.

General Program Information

The purpose of a BMP financial incentive program in Manitoba is to support agricultural producers in reducing identified environmental risk and improving the management of agricultural land. The goal of MSAPP is to reduce GHG emissions and improve the management of Manitoba's water resources, air quality, soil productivity and wildlife habitat.

Conditions for Eligibility

Eligible applicants include individuals, partnerships or operations incorporated under federal and/or provincial laws. Applicants must own, rent, lease, manage or control agricultural land used to produce agricultural products. Applicants must also possess a valid Statement of Completion certificate for an individual Environmental Farm Plan (EFP) or an Equivalent Agri-Environmental Plan (EAEP).

Funding will be distributed by farm business, which must be independent of all other farm businesses, as identified by the farm's GST number.

Note:

- **You must receive an approval letter from the program before proceeding with your project.** Retroactive submissions for projects that were started before September 1, 2009, will not be accepted. Submissions for projects that were started before you received an approval letter from the program will not be accepted.
- You will be required to obtain all necessary licences, permits and approvals before you begin your project. Manitoba Agriculture, Food and Rural Initiatives can help you identify these requirements.

Application Process

1. Complete your application and proposed plans. These may include a site plan (sketch), the location, type and estimated costs of all work to be performed, and the location of all nearby water bodies.
2. Submit your application to your local MAFRI Growing Opportunities (GO) Office; or mail or fax completed applications directly to:

Manitoba Agriculture Food and Rural Initiatives GO Office
Box 189
Somerset, Manitoba R0G 2L0
Fax: 204-744-4060

3. Upon receipt of your application, a notification letter will be mailed to you. The notification letter will identify a client services representative who will help you access the program. This does not grant you approval to begin your project. **You must wait until you receive an approval letter before proceeding with your project.**
4. Before approval, program staff may inspect the project site and provide technical advice. Additional information may be requested for some projects, if an environmental assessment is required under the Canadian Environmental Assessment Act (CEAA). If necessary, program staff may do an environmental assessment in accordance with the CEAA.

5. If the program approves your application, **an approval letter will be mailed to you.**
6. When you receive the approval letter, you may begin work and complete your project.
7. When the project is complete, submit documentation and invoices to the program.
8. The program will then send you payment.
9. An audit inspection of final work may be done either before or after payment is received.

Application Forms

The MSAPP applications are available at all MAFRI GO Offices and online at www.manitoba.ca/agriculture

Application Deadlines

Deadlines for applying to the program are: February 1, April 1, June 1, September 1 and November 1 for the life of the program.

Questions to Ask Yourself as You Prepare Your Application

- Is the project described fully and completely on the application form?
- Did you include a description of the environmental benefit associated with your intended project?
- Have you considered all expenses associated with the project?
- Have you taken measures to accurately estimate the costs of the project?

Technical Assistance

Before you submit your application, it is strongly recommended that you discuss your intended project with a MAFRI representative. Program technical leads have been designated for each BMP category. MAFRI staff can answer program questions, determine required project components, explain technical details and help estimate project costs.

Approval Process

At each application deadline, all applications will be ranked. They will be rated on the merit of the proposed project to reach its objective to reduce Manitoba's agricultural GHG emissions.

If the program funds have been fully subscribed for the fiscal year (April 1 – March 31), eligible applicants will be required to submit a new application at the next intake date. Applications will not be held.

In-kind Contributions

Both labour (at \$15 per hour) and the use of the applicant's equipment may be eligible for cost-sharing and included in the calculation of the total cost of the project. Equipment rental rates can be claimed at the rates described in the *Farm Machinery Rental and Custom Rate Guide*. Contact your local GO Office, or visit www.manitoba.ca/agriculture for a copy of the guide.

Rating and Raking Process Summary Guide

In order to maximize the environmental outcome of funded projects, project proposals were assessed according to three main criteria: environmental benefits assessment, Provincial program priorities and project planning. The following provides a short description of the parameters associated with this assessment process:

Section A - Environmental Benefit Assessment Index

The level to which the project addresses environmental risk is determined using an environmental benefit assessment index (EBAI). The EBAI created a rating of the environmental benefits that a specific land use change or other environmental practice would incur. **Environmental benefit categories included in each program's index are "weighted" to stress the importance of the environmental benefits, as dictated by the goal of each program.** For example, MSAPP's main objective is to reduce greenhouse gases (GHGs), therefore the emphasis and highest weighting will be on the climate change category. The other co-benefits of the incented practice will also be taken into account, but with a lower weight or emphasis. The categories and the parameters measured are:

- The **climate change** category captures the extent to which the project results in a reduction of greenhouse gases and provides measures adaptive to climate change in a cost-efficient manner.
- The **water quality** category is based on a project's ability to improve water quality by reducing the nutrients, pesticides and pathogens that enter waterways.
- The **soil quality** category assesses the relationship between the proposed project and its ability to reduce erosion and salinization, while improving soil quality.
- The **nutrient and water use efficiency** category provides a score for the project's ability to improve environmental farming practices that relate to efficient use of nutrients and water.
- The **biodiversity and natural habitat** category assesses a project's ability to improve overall biodiversity and improve wildlife habitat through environmental farming practices.

Section B - Provincial Program Priorities

Agriculture sustainability should address both agricultural objectives to promote a profitable and competitive agricultural sector and environmental objectives to reduce the impact of agricultural activities on the environment. These include:

- Potential to mitigate and adapt to climate change;
- Potential to increase level of carbon stored in the soil;
- Strategies that improve environmental stewardship; and
- Strategies that assist with meeting regulatory compliance and mitigating potential complaints.

Section C - Project Planning

Project proposals were scored based on their ability to clearly show the integrity of the project's intent and design. Specifically, that:

- The BMP applied for matched the risks identified in the Environmental Farm Plan workbook;
- The project intent was properly described and it fully explained the environmental benefit;
- The project costs were specific, realistic and properly itemized; and
- The project application has adequate design, including well defined locations and steps, and realistic completion timelines.

Questions?

For more information, visit your local GO Office. (call Manitoba Government Inquiry toll free at 1-866-626-4862 for the nearest GO Office); e-mail agrienv@gov.mb.ca; fax 204-744-4060; or write to Box 189, Somerset, Manitoba R0G 2L0.

Beneficial Management Practices (BMP) Categories and Practice Codes

Beneficial Management Practices offered under Manitoba Sustainable Agriculture Practices Program include the following:

BMP Category	Practice Code	Eligible Practices	Cost Share	Category Cap
Reduced GHG Emissions from Manure Storage	1201	Impermeable liquid manure storage covers to reduce greenhouse gases and odours, (includes engineering design work)	90%	\$100,000
	1202	Combustion technologies (ex: flaring equipment)		
Manure Land Application	1301	Specialized equipment and modification of existing equipment for improved manure application (ex: injector openers, sub-canopy applicators, aeration/infiltration tools, spreader tank agitator, flow meter, etc.)	75%	\$15,000
	1302	Equipment modification to enable side-dress manure application		
Reduced Tillage	1401	Equipment modification on pre-seeding implements for restricted zone tillage for row crops; low disturbance placement of seed and fertilizer	75%	\$15,000
Spring Fertilizer Application	1501	Equipment modification for fertilizer application at time of seeding including fertilizer delivery system and mid-row banders	75%	\$30,000
Perennial Cover for Sensitive Land	1601	Forage establishment for sensitive land (ex: tame or native perennial forages on severely erodible or saline soils); eligible items include cost of seed, seeding and weed control	75%	\$15,000
Cover Crops	1701	Establishment of cover crop, eligible items include cost of seed, seeding and weed control	75%	\$15,000
	1702	Equipment modification for inter-row seeding of cover crops within an existing row crop (ex: relay crops)		
Improved Pasture and Forage Quality	1801	Improved grazing management systems – perimeter and cross fencing to implement improved livestock grazing systems (ex: rotational, seasonal, deferred, swath, and bale grazing) that improve pasture quality and productivity; alternative watering systems (ex: solar, wind or grid)	75%	\$30,000
	1802	Improved forage quality - seed establishment of forage species for pastures and hayfields (ex: native and tame grasses and legumes).		
Increased Perennial Legumes in Annual Crop Rotation	1901	Establishment of perennial legumes; eligible items include cost of seed, seeding and weed control	75%	\$15,000
	1902	Equipment modification for seeding perennial legumes with an annual crop		
Grazing and Pasture Management Planning	2001	Consulting fees for grazing management plans and to produce reports	75%	\$15,000

Note: The maximum amount payable to one farm operation under MSAPP is \$100,000. However, collectively for all agri-environment BMP incentive programs in Manitoba, the maximum amount payable is \$160,000 over the life of the programs.

Additional BMP categories are available to Manitoba producers through the Environmental Farm Action Program (EFAP) under *Growing Forward*:

- Increased Manure Storage Capacity
- Improved Manure Storage and Handling
- Solid-Liquid Separation of Manure
- Manure Composting
- Farmyard Runoff Control
- Relocation of Livestock Confinement Facilities
- Wintering Site Management
- Riparian Area Management
- Improved Crop Residue Management
- Precision Agriculture Applications
- Nutrient Management Planning

For more information on these additional BMP categories, see the Environmental Farm Action Program – Beneficial Management Practices Catalogue or visit www.manitoba.ca/agriculture.

Reduced Greenhouse Gas Emissions from Manure Storage



Background/Objective:

Covering liquid manure storage facilities can be an effective way to reduce GHG emissions. Stored manure may emit nitrous oxide (N_2O) through the nitrification and denitrification processes, as well as methane (CH_4). CH_4 that is trapped may be flared off to produce CO_2 , a less potent GHG. Subsequently, if enough CH_4 is collected, it can be used as a heat source or for the generation of electricity.

Relevant sections of the *Manitoba Environmental Farm Plan Workbook*:

- Storage and Transportation of Livestock Manure (B9)

Related BMP categories:

In addition to this BMP category, you may also want to consider practices funded under the following:

- Manure Land Application (MSAPP)
- Increased Manure Storage Capacity (EFAP)
- Improved Manure Storage and Handling (EFAP)
- Solid-Liquid Separation of Manure (EFAP)
- Manure Composting (EFAP)
- Farm Yard Runoff Control (EFAP)
- Nutrient Management Planning (EFAP)

Please note that you must complete a separate Section 2 of the application form for each BMP category.

Practices eligible for funding:

Eligible Practice	Practice Code	Cost Share	Maximum
Impermeable liquid manure storage covers to reduce greenhouse gases and odours (includes engineering design work)	1201	90%	\$100,000
Combustion technologies (flaring equipment)	1202		

Note: Straw covers are not eligible.

Eligible costs and in-kind contributions:

Eligible costs	Engineering and/or contractor fees
	Geotechnical costs
	Earthwork
	Cost of materials
	Installation costs
Eligible in-kind costs	Labour (\$15 per hour)
	Use of applicant's equipment (at set program rates)
Ineligible costs	Fence and signs for safety

Notes:

- If manure cover is installed when liquid manure storage is being constructed to facilitate expanded production, the eligible cost will be proportionately reduced to reflect the cost required to implement the BMP at the existing level of production.

- Site assessment costs are considered an eligible expense for new infrastructure construction. However, site assessment costs that do not result in the construction of improved manure storage are not eligible under this category. Site assessments that are not intended for construction of improved manure storage facilities can be considered under the Nutrient Management Planning BMP category (EFAP).
- Non-livestock producers who accept livestock manure as part of their Nutrient Management Plan and who are storing, treating and applying the manure to produce agricultural crops are eligible. However, this incentive does not apply for operations intended to store, treat or sell manure strictly as a commercial venture.

Your Application Form:

Before you submit your application, it is strongly recommended that you discuss your intended project with a MAFRI representative. Program technical leads have been designated for each BMP category to help with your application. MAFRI staff can answer program questions, determine required project components, explain technical details and help estimate project costs.

Providing a clear, complete application containing all of the following information will speed up the application process. As you fill out your application, consider how your project will address environmental risk on your farm. Questions to address as you write your project description include:

- Are you considering expanding your operation as you implement this BMP?
- Are you interested in this BMP as a result of odour issues?
- What are you currently using for a liquid manure storage facility?

Reference Materials:

The following reference materials will provide you with more information on manure storage on farm:

- **Manitoba Agriculture, Food and Rural Initiatives**

www.manitoba.ca/agriculture

Manitoba Agriculture, Food and Rural Initiatives - Agri-Environment Knowledge Centre
www.gov.mb.ca/agriculture/soilwater/index.html

Farm Practice Guidelines for Hog/Poultry/Dairy/Beef Producers
www.gov.mb.ca/agriculture/livestock/beef/baa08s01.html

Living with Livestock Production fact sheet series:
www.gov.mb.ca/agriculture/livestock/publicconcerns/cwa01s00.html

Manure Management Facts fact sheet series:
www.gov.mb.ca/agriculture/soilwater/nutrient/fnm01s00.html

- Budgeting for Phosphorus - How Efficient is Your Farm?
- Calculating Manure Application Rates
- Managing Manure within Tillage Systems and Crop Rotations
- Manure Nutrients and their Behaviour in Soil
- Weed Seeds in Manure

- **Manitoba Conservation**

www.manitoba.ca/conservation

The Environment Act Livestock Manure and Mortalities Management Regulation 42/98 (as amended by 133/08)

Other information and fact sheets
www.gov.mb.ca/conservation/envprograms/livestock/index.html

- Obtaining a permit to construct, modify, or expand a manure storage facility
- Application for permit to construct, modify or expand a manure storage facility

- **Alberta Agriculture, Food and Rural Development**

www.agric.gov.ab.ca/app21/rtw/index.jsp

Manure Management and Greenhouse Gases – Things you need to know
[www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/cl10038/\\$file/GHGBulletinNo11Manuremanagement.pdf?OpenElement](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/cl10038/$file/GHGBulletinNo11Manuremanagement.pdf?OpenElement)

Manure Land Application



Background/Objective:

The use of manure as a fertilizer resource makes good economic and environmental sense. Manure can also improve soil quality by improving soil tilth, structure, aeration and water movement. While proper manure handling and application are crucial in optimizing your crop production, sound management also reduces odours, cuts down on GHG emissions and decreases nutrient losses from surface runoff or leaching. These problems are most common when manure is spread on the land surface.

When applying liquid manure, options are now available to directly inject it below the soil surface or at least broadcast near the ground. Injection or low-level broadcast of liquid manure reduces odour, volatilization and runoff risk and maximizes nutrient utilization. GHG emissions are also reduced when manure is injected rather than applied onto the soil surface.

Options are limited for solid manure, but it can be incorporated after surface application. Regardless of whether solid manure is incorporated or not, eliminating large lumps enables more uniform application and reduces environmental risk, nuisance odour, and may reduce GHG production. Composting solid manure can improve its handling and application, but the process must be managed carefully to minimize significant nutrient losses and GHG emissions.

Livestock manure management is covered in four pieces of Manitoba legislation. Producers should be familiar with all regulated aspects of manure application.

- Livestock Manure and Mortalities Management Regulation under *The Environment Act*
- Nutrient Management Regulation under *The Water Protection Act*
- Manure Regulation under *The Pesticide and Fertilizers Control Act*
- *The Farm Practices Protection Act*

Relevant sections of the **Manitoba Environmental Farm Plan Workbook:**

- Livestock Facilities and Wintering Sites (B8)
- Storage and Transport of Livestock Manure (B9)
- Manure Application (B18)

Related BMP categories:

In addition to this BMP category, you may also want to consider practices funded under the following:

- Reduced Greenhouse Gas Emissions from Manure Storage (MSAPP)
- Increased Manure Storage Capacity (EFAP)
- Improved Manure Storage and Handling (EFAP)
- Solid-Liquid Separation of Manure (EFAP)
- Manure Composting (EFAP)
- Nutrient Management Planning (EFAP)

Please note that you must complete a separate Section 2 of the application form for each BMP category.

Practices eligible for funding:

Eligible Practice	Practice Code	Cost Share	Maximum
Specialized equipment/modification of existing equipment to improve manure application	1301	75%	\$15,000
Equipment modification to enable side-dressed manure application	1302		

Eligible costs and in-kind contributions:

Eligible costs	<p>Liquid manure application:</p> <ul style="list-style-type: none"> • Injectors or sub-canopy applicators, aeration/infiltration tools • Distribution system • Frame to support openers/applicators • Spreader tank agitator <p>Solid manure application:</p> <ul style="list-style-type: none"> • Modifications/specialized equipment that provides significant improvement in pulverizing lumps and applying manure more evenly <p>Other:</p> <ul style="list-style-type: none"> • Monitoring equipment • Rate control devices • Scales • New or used equipment • Whole units or component parts
Eligible in-kind costs	Labour (\$15 per hour)

Notes:

- Soil and manure testing is highly recommended before and after manure application.
- Approved applications for modifications must be intended for individual private use and not for custom applicator operations.

Your Application Form:

Before you submit your application, it is strongly recommended that you discuss your intended project with a MAFRI representative. Program technical leads have been designated for each BMP category to help with your application. MAFRI staff can answer program questions, determine required project components, explain technical details and help estimate project costs.

Providing a clear, complete application containing all of the following information will speed up the application process. As you fill out your application, consider how your project will address environmental risk on your farm. Questions to address as you write your project description include:

- How many acres do you require for manure application? How many acres are available?
- What are your current manure application practices? How will these practices change with the equipment you are applying for?
- How will the new practices benefit the environment?

Manure Land Application

Reference Materials:

The following reference material will provide you with more information on manure land application:

- **Manitoba Agriculture, Food and Rural Initiatives**

www.manitoba.ca/agriculture

Farm Practice Guidelines for Hog/Poultry/Dairy/Beef Producers

www.gov.mb.ca/agriculture/livestock/beef/baa08s01.html

Tri-Provincial Manure Application and Use Guidelines – Manitoba Version

www.gov.mb.ca/agriculture/crops/cropproduction/gaa01d39.html

Soil Fertility Guide

www.gov.mb.ca/agriculture/soilwater/nutrient/fbd02s00.html

Manure Application Rate Calculator

www.gov.mb.ca/agriculture/livestock/marc

Manure Sampling and Analysis

www.gov.mb.ca/agriculture/livestock/poultry/bba01s24.html

Living with Livestock Production fact sheet series

www.gov.mb.ca/agriculture/livestock/publicconcerns/cwa01s00.html

Manure Management Facts fact sheet series

www.gov.mb.ca/agriculture/soilwater/nutrient/fnm01s00.html

- Budgeting for Phosphorus - How Efficient is Your Farm?
- Calculating Manure Application Rates
- Managing Manure within Tillage Systems and Crop Rotations
- Manure Nutrients and their Behaviour in Soil
- Weed Seeds in Manure

- **Manitoba Conservation**

www.manitoba.ca/conservation

The Environment Act Livestock Manure and Mortalities Management Regulation 42/98

Manure Management Plan

www.gov.mb.ca/conservation/envprograms/livestock/index.html

- **Assiniboine Community College**

<http://public.assiniboine.net>

Program Co-ordinator 204-725-8700 (ext. 7116) in Winnipeg

- Commercial and Large Off-farm Manure Applicators Course
- Manure Management Planners Course

- **Ontario Ministry of Agriculture, Food and Rural Affairs**

Automatic and Remotely Controlled Shutoff for Direct-Flow Liquid Manure Application System

www.omafra.gov.on.ca/english/engineer/facts/04-091.htm

- **Alberta Agriculture, Food and Rural Development**

www.agric.gov.ab.ca/app21/rtw/index.jsp

Manure Management and Greenhouse Gases – Things you need to know

[www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/cl10038/\\$file/GHGBulletinNo11Manuremanagement.pdf?OpenElement](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/cl10038/$file/GHGBulletinNo11Manuremanagement.pdf?OpenElement)

Reduced Tillage



Background/Objective:

Reduced tillage practices can improve soil structure and fertility and provide protection against soil erosion. Use of low disturbance technology can reduce fuel consumption, increase carbon sequestration and diminish nitrous oxide (N₂O) production.

By reducing tillage on your farm, you can:

- reduce the amount of fuel used
- improve air and water quality by reducing soil erosion
- conserve soil moisture
- increase residue on the soil surface (which traps snow and reduces germination of small weeds)
- improve the natural habitat for wildlife
- improve soil structure and fertility

Relevant sections of the *Manitoba Environmental Farm Plan Workbook*:

- Soil Management (B10)
- Commercial Fertilizer Management for Crop Production (Nutrient Management) (B11)
- Field Crop Management (B13)

Related BMP categories:

In addition to this BMP category, you may also want to consider practices funded under the following:

- Spring Fertilizer Application (MSAPP)
- Perennial Cover for Sensitive Land (MSAPP)
- Cover Crops (MSAPP)
- Increased Perennial Legumes in Annual Crop Rotation (MSAPP)
- Precision Agriculture Applications (EFAP)
- Improved Crop Residue Management (EFAP)
- Nutrient Management Planning (EFAP)

Please note that you must complete a separate Section 2 of the application form for each BMP category.

Practices eligible for funding:

Eligible Practice	Practice Code	Cost Share	Maximum
Equipment modification on pre-seeding implements for restricted zone tillage for row crops; low disturbance placement of seed and fertilizer	1401	75%	\$15,000

Eligible costs and in-kind contributions:

Eligible costs	Materials, supplies and modifications
	Installation costs
Eligible in-kind costs	Labour for modification of specialized equipment (\$15 per hour)
Ineligible costs	Seeding implement frames, tanks, delivery systems (hoses)
	Openers for anhydrous applicators for fall/spring anhydrous application
	Equipment rental and custom work
	Fertilizer air kit and tanks
	Coil packers or packer wheels installed on hoe or double disc drills

Reduced Tillage

Notes:

- Low disturbance application of fertilizer in the fall or before seeding **is not eligible** for funding (ex: fertilizer rate controllers or openers mounted on deep tillers for spring/fall application of anhydrous).
- Equipment does not have to be purchased new. Used equipment is also eligible.
- Funding will be provided for equipment modification or eligible equipment components on an entire unit. Funding will not be provided for complete units of equipment.
- Gang and shank-mounted on-row packers are eligible. However, they must be part of a complete conversion to low disturbance. Packers are not eligible as a stand-alone item. Packers must match the shank spacing and width.

Your Application Form:

Before you submit your application, it is strongly recommended that you discuss your intended project with a MAFRI representative. Program technical leads have been designated for each BMP category to help with your application. MAFRI staff can answer program questions, determine required project components, explain technical details and help estimate project costs.

Providing a clear, complete application containing all of the following information will speed up the application process. As you fill out your application, consider how your project will address environmental risk on your farm. Questions to address as you write your project description include:

- In your opinion, what are the advantages of reducing tillage on your farm?
- Will this practice be implemented long term?
- What is your current tillage practice (conventional, reduced, zero-till)?
- What type of drill will you put the system on?
- Are you purchasing a new drill?
- How wide is the drill?
- What is the spacing between the shanks?
- How many shanks are on the unit?
- After installing the proposed unit on your drill, what will your tillage practice be (conventional, reduced, zero-till)?
- What type of soil do you have?
- What is the major crop production limitation of your soil type?
- What are the environmental benefits that would arise from converting to this type of implement?

Reference Materials:

The following reference material will provide you with more information on manure land application:

- **Manitoba Agriculture, Food and Rural Initiatives**
www.manitoba.ca/agriculture
Soil Management Guide
www.gov.mb.ca/agriculture/soilwater/soilmgmt/fsm01s00.html
- **Manitoba-North Dakota Zero Tillage Farmers Association**
www.mandakzerotill.org
Zero Tillage: Advancing the Art
[www.mandakzerotill.org/books/manuals/Advancing %20the%20Art/artindex.html](http://www.mandakzerotill.org/books/manuals/Advancing%20the%20Art/artindex.html)
- **Manitoba Zero Tillage Research Association Factsheets**
www.mbzerotill.com/page.aspx?page_id=348

Spring Fertilizer Application



Background/Objective:

Spring application of nitrogen fertilizer has several environmental benefits for air and water quality. During the spring thaw, soil is saturated, increasing the risk of nitrous oxide (N₂O) emissions from nitrogen fertilizer applied the previous fall. Application of fertilizer in the spring, after the soil is completely thawed, increases nutrient absorption and significantly reduces the amount of nitrogen lost in runoff to surface water bodies, leaching to ground water or transformation to N₂O.

To facilitate spring application of fertilizers, this BMP provides funding for equipment modification for spring application of fertilizer at seeding time.

By improving your fertilizer application, you can:

- improve crop nutrient use efficiency
- reduce GHG emissions

Relevant sections of the Environmental Farm Plan Workbook:

- Commercial Fertilizer Management for Crop Production (Nutrient Management) (B1 1)
- Field Crop Management (B1 3)

Related BMP categories:

In addition to this BMP category, you may also want to consider practices funded under the following:

- Reduced Tillage (MSAPP)
- Perennial Cover for Sensitive Land (MSAPP)
- Cover Crops (MSAPP)
- Increased Perennial Legumes in Annual Crop Rotation (MSAPP)
- Improved Crop Residue Management (EFAP)
- Precision Agriculture Applications (EFAP)
- Nutrient Management Planning (EFAP)

Please note that you must complete a separate Section 2 of the application form for each BMP category.

Practices eligible for funding:

Eligible Practice	Practice Code	Cost Share	Maximum
Equipment modification for fertilizer application at time of seeding, including mid-row banders	1501	75%	\$30,000

Spring Fertilizer Application

Eligible costs and in-kind contributions:

Eligible costs	Materials, supplies and modifications
	Installation costs
Eligible in-kind costs	Labour (\$15 per hour)
Ineligible costs	Equipment rental and custom work
	Openers for anhydrous applicators for fall/spring anhydrous application
	Seeding implement frames and tanks
	Fertilizer delivery systems (hoses) as a stand alone practice

Notes:

- The intent of this BMP is to transition from fall fertilizer application to single pass seeding and fertilizing in the spring, therefore eligible equipment is to be specific for use on spring seeding implements.
- Fertilizer delivery systems (hoses) are eligible for funding. However, they must be part of a complete conversion to spring application of fertilizer.
- Funding will be provided for equipment modification or eligible equipment components on an entire unit. Funding will not be provided for complete units of equipment.
- Equipment does not have to be purchased new. Used equipment is also eligible.

Your Application Form:

Before you submit your application, it is strongly recommended that you discuss your intended project with a MAFRI representative. Program technical leads have been designated for each BMP category to help with your application. MAFRI staff can answer program questions, determine required project components, explain technical details and help estimate project costs.

Providing a clear, complete application containing all of the following information will speed up the application process. As you fill out your application, consider how your project will address environmental risk on your farm. Questions to address as you write your project description include:

- Are you modifying your existing equipment or buying new?
- What type of nitrogen fertilizer will you be using?
- What type of equipment will be needed for optimum spring fertilization on your farm?
- How many acres do you normally fertilize with nitrogen in fall?
- What nitrogen fertilizer rate do you normally apply in fall?
- After modifying your seeder for spring fertilizer application how many acres do you expect to fertilize with nitrogen in fall?
- Will the total nitrogen rate be affected by going to spring fertilization? If so, by how much?

Reference Materials:

The following reference materials will provide you with more information on improving fertilizer storage and fertilizer application on farm:

- **Federal Legislation**

Agricultural Products Act

<http://laws.justice.gc.ca/en/showdoc/cs/C-0.4//20090818/en?page=1>

Canadian Environmental Protection Act

http://www.ec.gc.ca/CEPARRegistry/the_act/

Canadian Food Inspection Agency Act

<http://laws.justice.gc.ca/en/C-16.5/>

Fisheries Act

<http://laws.justice.gc.ca/en/F-14/>

- **Provincial Legislation**

The Environment Act

<http://web2.gov.mb.ca/laws/statutes/ccsm/e125e.php>

The Pesticides and Fertilizers Control Act

<http://web2.gov.mb.ca/laws/statutes/ccsm/p040e.php>

- **Manitoba Agriculture, Food and Rural Initiatives**

www.manitoba.ca/agriculture

Soil Fertility page

www.gov.mb.ca/agriculture/soilwater/nutrient/fnm02s00.html

Soil Fertility Guide

www.gov.mb.ca/agriculture/soilwater/nutrient/fbd02s00.html

Soil Management Guide

www.gov.mb.ca/agriculture/soilwater/soilmgmt/fsm01s00.html

- **Alberta Agriculture, Food and Rural Development**

www.agric.gov.ab.ca/app21/rtw/index.jsp

Greenhouse Gas Emissions Alberta's Cropping Industry

[www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/cl3010/\\$file/GHGBulletinNo5Cropping.pdf?OpenElement](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/cl3010/$file/GHGBulletinNo5Cropping.pdf?OpenElement)

Perennial Cover for Sensitive Land



Background/Objective:

Long term soil quality is affected by erosion and salinity. While erosion occurs on all soils, its rate varies considerably depending on soil type, landscape characteristics and management practices. Salinity levels can also be affected by a producer's management practices. The objective of this BMP is to minimize erosion and salinization in sensitive areas on agricultural land.

Conversion of sensitive lands from annual crop production to perennial cover can improve levels of soil organic matter and may contribute to improved grazing and increased biodiversity. Converting sensitive lands from annual crop rotation to perennial forages reduces GHG emissions by:

- reducing nitrogen fertilizer application rates on land that tends to be less productive (less uptake of the nitrogen fertilizer applied) and reduces production of the GHG nitrous oxide (N₂O)
- increasing carbon sequestration removes carbon dioxide (CO₂) from the atmosphere and stores it in plant biomass and soil

Specific soil risk areas include:

- areas with concentrated water flow; or areas with a significant runoff risk
- steep slopes susceptible to water erosion
- extremely sandy soils susceptible to wind erosion
- land affected by soil salinity

Relevant sections of the Environmental Farm Plan Workbook:

- Soil and Site Characteristics (A1)
- Water Source Protection and Management (B1)
- Soil Management (B10)
- Field Crop Management (B13)

Related BMP categories:

In addition to this BMP category, you may also want to consider practices funded under the following:

- Cover Crops (MSAPP)
- Riparian Area Management (EFAP)

Please note that you must complete a separate Section 2 of the application form for each BMP category.

Practices Eligible for Funding:

Eligible Practice	Practice Code	Cost Share	Maximum
Perennial forage establishment on severely erodible or saline soils	1601	75%	\$15,000

Eligible costs and in-kind contributions:

Eligible costs	Costs of seed, seeding and weed control
Eligible in-kind costs	Labour (\$15 per hour)
	Applicant's equipment use (at set program rates)
Ineligible costs	Fencing for grazing management
	Cover crops/nurse crops to aid in perennial crop establishment
	Pre-seeding field preparation

Notes:

- The intention of this BMP is to maintain permanent perennial cover on sensitive land. The land should not be converted from perennial forages to annual crops because the environmental benefits would not be upheld.
- Funding assistance for perennial forage establishment is limited to a maximum of 40 acres per project (typically per quarter section).
- Species used should be adapted to Manitoba conditions, hardy and non-invasive.
- The use of certified seed (or an equivalent) is recommended to ensure high quality germination and purity.

Your Application Form:

Before you submit your application, it is strongly recommended that you discuss your intended project with a MAFRI representative. Program technical leads have been designated for each BMP category to help with your application. MAFRI staff can answer program questions, determine required project components, explain technical details and help estimate project costs.

Providing a clear, complete application containing all of the following information will speed up the application process. As you fill out your application, consider how your project will address environmental risk on your farm. Questions to address as you write your project description include:

- What is the risk associated with these sensitive lands: risk of runoff, water erosion, soil erosion, and/or soil salinity?
- What kind of vegetation will be used?
- Will native vegetation be used? If so, what kinds?
- What seeding rate will you use?
- How and when will the crop be established?

Perennial Cover for Sensitive Land

Reference Materials:

The following reference material will provide you with more information on establishing perennial cover for sensitive lands:

- **Agriculture and Agri-Food Canada – Agri-Environment Services Branch (AAFC-AESB)**
www.agr.gc.ca/aesb
- **Fisheries and Oceans Canada**
www.dfo-mpo.gc.ca/index-eng.htm
Working around Water
www.dfo-mpo.gc.ca/regions/central/pub/index-eng.htm
- **Manitoba Agriculture, Food and Rural Initiatives**
www.gov.mb.ca/agriculture
Soil Management Guide
www.gov.mb.ca/agriculture/soilwater/soilmgmt/fsm01s00.html
Annual barriers for specialty crops
www.gov.mb.ca/agriculture/soilwater/soil/fbd01s07.html
- **Alberta Agriculture, Food and Rural Development**
www.agric.gov.ab.ca; 1-888-882-7677
Introduction to water erosion control
[www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex2074](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex2074)
Grassed waterway construction
[www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex795](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex795)
About soil erosion
www.agric.gov.ab.ca/sustain.abouterosion.html
- **British Columbia Ministry of Agriculture, Food and Fisheries**
www.gov.bc.ca/al/
BC Agricultural Fencing Handbook
<http://www.agf.gov.bc.ca/range/factsheets.htm>
- **United States Department of Agriculture – Natural Resource Conservation Service (USDA-NRCS)**
www.nrcs.usda.gov/
National Handbook of Conservation Practices
www.nrcs.usda.gov/technical/Standards/nhcp.html
- **Manitoba Forage Council**
www.mbforagecouncil.mb.ca

Cover Crops



Background/Objective:

Cover crops use excess nitrogen in the soil, effectively retaining nutrients for the next growing season while reducing nitrous oxide (N₂O) emissions. Legume cover crops fix nitrogen from the atmosphere, potentially reducing the nitrogen fertilizer application rate for the next year. Cover crops may also increase carbon sequestration, where carbon dioxide (CO₂) is removed from the atmosphere and stored in plant biomass and soil.

Cover crops can protect soil from raindrop impact, preserving soil aggregates after the fall harvest of row crops or other crops that leave the soil exposed with little crop residue. Vegetative cover on the soil surface controls erosion by slowing the velocity of runoff water. This means less soil is carried away in the flow and may even permit suspended sediment to be deposited. This can reduce the risk of pesticides, nutrients and pollutants moving off the field. Cover crops also have the added benefits of adding organic matter, reducing the risk of wind erosion and improving soil structure.

The earlier a cover crop is established, the more effective it will be in controlling erosion and reducing GHG emissions. For crops like winter wheat that mature early, it may be feasible to seed the cover crop immediately after harvest. For slower growing crops that are harvested later in the fall, it may not be possible to establish a cover crop before winter. In such cases, relay crops are sometimes used to provide post-harvest ground protection. Relay crops are planted earlier in the year, often shortly after the primary crop is seeded. The relay crop remains after the primary crop is removed. Green fallow and biennial green manure crops are also used to control soil erosion, build soil organic matter, and produce nitrogen for subsequent crops.

The objective of this BMP is to protect soil, air and waterways by helping producers establish a cover crop or make modifications to existing seeding equipment to facilitate inter-row seeding of a relay crop. Cover crops are useful in a variety of field conditions. They can also be seeded between existing rows of annual crops such as corn, cole (cabbage) crops or perennial row crops, such as raspberries and strawberries.

Relevant sections of the *Manitoba Environmental Farm Plan Workbook*:

- Water Source Protection and Management (B1)
- Soil Management (B10)
- Field Crop Management (B13)
- Drainage and Irrigation (B17)

Related BMP categories:

In addition to this BMP category, you may also want to consider practices funded under the following:

- Perennial Cover for Sensitive Land (MSAPP)

Please note that you must complete a separate Section 2 of the application form for each BMP category.

Cover Crops

Practices eligible for funding:

Eligible Practice	Practice Code	Cost Share	Maximum
Establishment of a cover crop. Options include: <ul style="list-style-type: none"> • Winter cover crops (seeded after harvest for late fall, winter and spring soil protection) • Relay crops (planted with primary crop but remain after primary crop is removed) • Green fallow crops (annual seeded during fallow year) • Biennial green manure crops (underseeded crops providing soil protection for the following year) 	1701	75%	\$15,000
Equipment modification to facilitate inter-row seeding of relay crop within an existing row crop	1702		

Eligible costs and in-kind contributions:

Eligible costs	Costs of seed, seeding and weed control
	Seeding materials, supplies and modifications for equipment
	Installation costs
Eligible in-kind costs	Labour (\$15 per hour)
	Applicant's equipment use (at set program rates)
Ineligible costs	Funding will not be provided for complete seeding units, only components required to modify existing equipment

Notes:

- If funding is provided for seed/weed control, the crop cannot be harvested or sold off-farm for economic gain. Grazing of the cover crop is permitted.
- Species used should be adapted to Manitoba conditions, hardy and non-invasive.
- The use of certified seed (or an equivalent) is recommended to ensure high quality germination and purity.
- Funding will not be provided for the purchase of complete seeding units.
- Funding will not be provided for both seeding/weed control and equipment modification.

Your Application Form:

Before you submit your application, it is strongly recommended that you discuss your intended project with a MAFRI representative. Program technical leads have also been designated for each BMP category to help you with your application. MAFRI staff can answer program questions, determine required project components, explain technical details and help estimate project costs.

Providing a clear, complete application containing all of the following information will speed up the application process. As you fill out your application, consider how your project will address environmental risk on your farm. Questions to address as you write your project description include:

- What kind of cover crop will be used? What is the seeding rate you will use?
- What is your proposed crop rotation? What crops will the cover crop be under seeded with?
- What is the fate of the crop? Will it be incorporated, sprayed, or grazed?
- What is the risk associated with these sensitive lands: risk of runoff, water erosion, soil erosion and/or leaching nutrients?
- How will planting this cover crop benefit the environment compared to your normal practice?

Reference Materials:

The following reference material will provide you with more information on establishing cover crops:

- **Manitoba Agriculture, Food and Rural Initiatives**

www.manitoba.ca/agriculture

Cover crops on special crops land

www.gov.mb.ca/agriculture/soilwater/soil/fbd01s08.html

Cover crops to protect soil from erosion after potato harvest

www.gov.mb.ca/agriculture/soilwater/soil/fbd01s01.html

Annual barriers for special crops

www.gov.mb.ca/agriculture/soilwater/soil/fbd01s07.html

Forage production and management

www.gov.mb.ca/agriculture/crops/forages/bja03s00.html

- **Alberta Agriculture, Food and Rural Development**

www.agric.gov.ab.ca

Legume Green Manuring

[www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex133?opendocument](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex133?opendocument)

Improving Soil Fertility with Green Manure Legume Crops – Frequently Asked Questions

[www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/faq7979](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/faq7979)

Improved Pasture and Forage Quality



Background/Objective:

Forage species affect the length of the grazing season and the carrying capacity of the pasture. Animal performance is influenced by the quality of pasture or the harvested hay consumed. Improving pasture and feed quality reduces GHG emissions in several ways:

- Improved management of forage lands can increase the rate of carbon sequestration so carbon dioxide (CO₂) is removed from the atmosphere and stored in plant biomass and soil.
- Reduced nitrogen fertilizer application rates, on perennial forages that contain legume species, will reduce the production of nitrous oxide (N₂O).
- The quality of forage and the choice of species included in the pasture or feed also affects the production of methane (CH₄). With improved forage quality, cattle digest feed more efficiently, reducing CH₄ production and improving animal performance.

By implementing improved grazing strategies, you can:

- improve soil and water quality
- increase productivity and economic gains
- reduce GHG emissions
- increase environmental benefits
- reduce stream-bank degradation
- improve nutrient and water retention on your land
- integrate various methods of resource management

Relevant sections of the *Manitoba Environmental Farm Plan Workbook*:

- Water Source Protection and Management (B1)
- Livestock Facilities and Wintering Sites (B8)
- Soil Management (B10)
- Pasture Management (B16)

Related BMP categories:

In addition to this BMP category, you may also want to consider practices funded under the following:

- Grazing and Pasture Management Planning (MSAPP)
- Farm Yard Runoff Control (EFAP)
- Relocation of Livestock Confinement Facilities (EFAP)
- Wintering Site Management (EFAP)
- Riparian Area Management (EFAP)
- Nutrient Management Planning (EFAP)

Please note that you must complete a separate Section 2 of the application form for each BMP category.

Practices eligible for funding:

Eligible Practice	Practice Code	Cost Share	Maximum
Improved grazing management systems: <ul style="list-style-type: none"> • Perimeter fencing • Permanent or temporary cross fencing to improve grazing strategies • Alternative watering systems 	1801	75%	\$30,000
Improved forage quality <ul style="list-style-type: none"> • Perennial forage establishment 	1802		

Eligible costs and in-kind contributions:

Eligible costs	Fencing materials
	Water systems equipment and installation
	Costs of seed, seeding and weed control
Eligible in-kind costs	Labour (\$15 per hour)
	Applicant's equipment use (at set program rates)
Ineligible costs	Perimeter fencing for riparian grazing management

Notes:

- Only non-riparian pastures are eligible under this BMP. Riparian pastures may be eligible under the Riparian Area Management BMP category (EFAP).
- Funding is available to seed native, tame and/or legume species.

Your Application Form:

Before you submit your application, it is strongly recommended that you discuss your intended project with a MAFRI representative. Program technical leads have been designated for each BMP category to help with your application. MAFRI staff can answer program questions, determine required project components, explain technical details and help estimate project costs.

Providing a clear, complete application containing all of the following information will speed up the application process. As you fill out your application, consider how your project will address environmental risk on your farm. Questions to address as you write your project description include:

- What kind of vegetation will be used? Will native vegetation be used? If so, what kinds?
- Have you considered the grazing management practices that would be implemented?
- What type of fence will be used? How many strands of wire will it have? How long will the fence be?
- What type of watering system will be used?
- Has a site plan been included with the application that clearly indicates the project design?
- Have eligible expense estimates been itemized? Are there quotes for items that could be included?
- How will this project benefit the environment?
- How many acres will this project influence?

Improved Pasture and Forage Quality

Reference Materials:

The following reference material will provide you with more information on improving pasture and forage quality:

- **Manitoba Agriculture, Food and Rural Initiatives**

www.manitoba.ca/agriculture

Forage production and management

www.gov.mb.ca/agriculture/crops/forages/bja03s00.html#Pasture_Production

- **Alberta Agriculture, Food and Rural Development**

www.agric.gov.ab.ca

Cattle wintering sites

[www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex3517](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex3517)

- **British Columbia Ministry of Agriculture, Food and Fisheries**

<http://www.gov.bc.ca/al/>

BC Agriculture Fencing Handbook

www.agf.gov.bc.ca/range/factsheets.htm

- **Manitoba Forage Council**

www.mbforagecouncil.mb.ca

Projects and Technical Info

www.mbforagecouncil.mb.ca/projectstechnicalinfo/factsheets/default.aspx

Forage and Grassland Manual

www.mbforagecouncil.mb.ca/foragegrasslandmanual/default.aspx

- **Alberta Sustainable Resource Development**

<http://www.srd.gov.ab.ca/>

Rangeland health assessment for grassland, forest, and tame pasture

www.srd.gov.ab.ca/lands/managingpublicland/rangemanagement/healthassessment.aspx

- **Foragebeef.ca**

www.foragebeef.ca

Increased Perennial Legumes in Annual Crop Rotation



Background/Objective:

There are benefits to including short term perennial legume stands in annual crop rotations. Perennial legumes, used in rotation, traditionally remain for three to five years. They can be harvested or incorporated into the field to enhance soil organic matter and the ability to retain moisture and nutrients. Vegetative cover controls erosion by reducing the impact of raindrops on bare soil and slowing the velocity of runoff water. Grain crops in subsequent rotations tend to produce higher yields due to the residual nutrients. Regular inclusion of forage crops in annual cropping rotations provides greater stability and profitability of the entire cropping systems.

The inclusion of legumes in an annual crop rotation reduces GHG emissions and improves soil quality in several ways:

- Legumes fix nitrogen from the atmosphere, reducing the nitrogen fertilizer application rate and potentially decreasing nitrous oxide (N₂O) emissions in subsequent cropping years.
- Perennial legumes may also increase carbon sequestration because carbon dioxide (CO₂) is removed from the atmosphere and stored in plant biomass and soil.

Relevant sections of the Environmental Farm Plan Workbook:

- Soil and Site Characteristics (A1)
- Soil Management (B10)
- Field Crop Management (B13)

Related BMP categories:

In addition to this BMP category, you may also want to consider practices funded under the following:

- Cover Crops (MSAPP)

Please note that you must complete a separate Section 2 of the application form for each BMP category.

Practices eligible for funding:

Eligible Practice	Practice Code	Cost Share	Maximum
Establishment of perennial legumes	1901	75%	\$15,000
Equipment modification for seeding perennial legumes with an annual crop	1902		

Eligible costs and in-kind contributions:

Eligible costs	Costs of seed, seeding and weed control
	Materials, supplies, and modifications for equipment
	Installation costs
Eligible in-kind costs	Labour for equipment modification (\$15 per hour)
Ineligible costs	Funding will not be provided for complete seeding units, only components required to modify existing equipment will be funded

Increased Perennial Legumes in Annual Crop Rotation

Notes:

- Land must be Canada Land Inventory Class 1, 2 or 3.
- Perennial legume crops must remain in production for three years after seeding, including the year of establishment.
- Perennial legumes must not have been used previously in the crop rotation on the land for which you are applying for funding.
- Species used should be adapted to Manitoba conditions, hardy and non-invasive.
- The use of certified seed (or an equivalent) is recommended to ensure high quality germination and purity.
- You cannot receive funding for both seeding/weed control and equipment modification.

Your Application Form:

Before you submit your application, it is strongly recommended that you discuss your intended project with a MAFRI representative. Program technical leads have been designated for each BMP category to help with your application. MAFRI staff can answer program questions, determine required project components, explain technical details and help estimate project costs.

Providing a clear, complete application containing all of the following information will speed up the application process. As you fill out your application, consider how your project will address environmental risk on your farm. Questions to address as you write your project description include:

- What types of perennial legumes will you include?
- What is the crop rotation?
- Have you previously included perennial legumes in your annual crop rotation? If so, when and for how long?
- What seeding rate will you use?
- How and when will the crop be established?
- How will including this perennial legume in your crop rotation benefit the environment compared to your normal practice?

Reference Materials:

The following reference material will provide you with more information on increasing perennial legumes in annual crop rotations:

- **Manitoba Agriculture, Food and Rural Initiatives**
www.manitoba.ca/agriculture
Forage Production and Management
www.gov.mb.ca/agriculture/crops/forages/bja03s00.html
- **Alberta Agriculture, Food and Rural Development**
www.agric.gov.ab.ca
Improving Soil Fertility with Green Manure Legume Crops – Frequently Asked Questions
[www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/faq7979](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/faq7979)

Grazing and Pasture Management Planning



Background/Objective:

A well-managed pasture can improve pasture productivity and quality, leading to greater carrying capacity and improved animal performance. Improved management of forage lands can also increase the rate of carbon sequestration, as carbon dioxide (CO₂) is removed from the atmosphere and stored in plant biomass and soil. Some specific techniques for pasture management that may be included in a plan are:

- Timing and duration of grazing
- Grazing intensity
- Stocking rates and densities
- Paddock rotation
- Management of undesirable plant species
- Management of soil fertility

A grazing management plan helps identify specific recommendations for individual farms. The plan can:

- Improve soil and water quality
- Increase productivity and economic gains
- Reduce GHG emissions
- Increase environmental benefits
- Reduce stream-bank degradation
- Improve nutrient and water retention on your land
- Integrate various methods of resource management

A grazing management plan, which should be developed by a qualified person, must:

- Identify current issues and the impact of current management:
 - Assess range and pasture conditions for productive capacity and capability to achieve environmental benefits of biodiversity, riparian health, erosion protection, etc.
 - Discuss the impact of current grazing management on current range conditions, focusing on management that is leading to undesirable results
 - Assess the impact of current extended grazing and out-of-yard winter feeding strategies for production capacity and capability to achieve environmental benefits
- Identify improved grazing management options and any constraints:
 - Identify various options for improved grazing management (season long, extended grazing, out-of-yard winter feeding) that reduce environmental risks and maintain or improve productive capacity
 - Identify constraints and costs associated with implementing various options
- Develop an improved grazing management strategy:
 - Select the most promising improved grazing management options [Note: your choice should address environmental issues on all land, including riparian and upland areas, all year round]
 - Identify other management adjustments required for implementation
 - Develop an implementation timetable, from the initial demonstration stage to the eventual full implementation
- Develop an improved grazing management evaluation process:
 - Recommend a process for monitoring and evaluating the effectiveness of the grazing management enhancements
 - Make adjustments to management, based on continual monitoring and evaluation

Grazing and Pasture Management Planning

Relevant sections of the Environmental Farm Plan Workbook:

- Water Source Protection and Management (B1)
- Livestock Facilities and Wintering Sites (B8)
- Soil Management (B10)
- Pasture Management (B16)

Related BMP categories:

In addition to this BMP category, you may also want to consider practices funded under the following:

- Improved Pasture and Forage Quality (MSAPP)
- Farmyard Runoff Control (EFAP)
- Relocation of Livestock Confinement (EFAP)
- Wintering Site Management (EFAP)
- Riparian Area Management (EFAP)
- Nutrient Management Planning (EFAP)

Please note that you must complete a separate Section 2 of the application form for each BMP category.

Practices eligible for funding:

Eligible Practice	Practice Code	Cost Share	Maximum
Consulting fees for grazing management plan and report for farmer Planning and decision support tools (ex: computer software, aerial photos)	2001	75%	\$15,000

Eligible costs and in-kind contributions:

Eligible costs	Consulting fees
	Planning and decision support tools (computer software, aerial photos)
Ineligible costs	Computer hardware

Notes:

- A copy of your grazing management plan will be required before you receive payment.
- Applicants are only eligible for a one-time payment per field under this BMP.

Your Application Form:

Before you submit your application, it is strongly recommended that you discuss your intended project with a MAFRI representative. Program technical leads have been designated for each BMP category to help with your application. MAFRI staff can answer program questions, determine required project components, explain technical details and help estimate project costs.

Providing a clear, complete application containing all of the following information will speed up the application process. As you fill out your application, consider how your project will address environmental risk on your farm.

Reference Materials:

The following reference material will provide you with more information on grazing and pasture management planning:

- **Manitoba Agriculture, Food and Rural Initiatives**
www.manitoba.ca/agriculture
Forage production and management
www.gov.mb.ca/agriculture/crops/forages/bja03s00.html#Pasture_Production
- **Alberta Agriculture, Food and Rural Development**
www.agric.gov.ab.ca
Cattle wintering sites
[www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex3517](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex3517)
- **British Columbia Ministry of Agriculture, Food and Fisheries**
<http://www.gov.bc.ca/al/>
BC Agriculture Fencing Handbook
<http://www.agf.gov.bc.ca/range/factsheets.htm>
- **Manitoba Forage Council**
www.mbforagecouncil.mb.ca
Projects and Technical Info
www.mbforagecouncil.mb.ca/projectstechnicalinfo/factsheets/default.aspx
Forage and Grassland Manual
www.mbforagecouncil.mb.ca/foragegrasslandmanual/default.aspx
- **Alberta Sustainable Resource Development**
<http://www.srd.gov.ab.ca/>
Rangeland health assessment for grassland, forest and tame pasture
www.srd.gov.ab.ca/lands/managingpublicland/rangemanagement/healthassessment.aspx
- **Foragebeef.ca**
www.foragebeef.ca

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