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Implications of BRM Program Participation on the Feasibility of Beneficial Management Practices Adoption

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Poster-01-2013
January 2013

Canada

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Growing Forward

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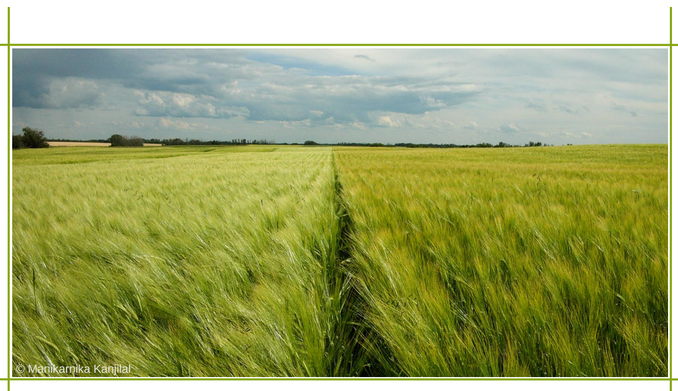


INTRODUCTION

- Business risk management (BRM) programs aid producers in coping with risks associated with agricultural production.
- Practices that are valuable to the surrounding environment are beneficial management practices (BMPs) and contribute to the production of ecosystem services (ES).
- Land use decisions may be altered by BRM program participation which may contribute to or diminish ES on agricultural lands.

OBJECTIVES

I. Evaluate the impact of BRM programs on economic performance of agricultural operations in Alberta

II. Investigate the economic effects of BRM program participation on BMP adoption.

REPRESENTATIVE FARMS

Specifics of the representative cropping and mixed (i.e., cropping and cow-calf) enterprises used in the analysis are provided in Tables 1 and 2, respectively. The probabilities of catastrophic yield and cattle price events are 4%.

Table 1. Cropping enterprise characteristics

Location	Starland County, Dark Brown soil zone
Size	1,295 hectares
Base rotation[1]	Spring wheat (SW), canola (C), barley (B), summer fallow (SF)
BMP rotations[1]	I. SW, C, B, field pea, SW, SF II. SW, C, winter wheat, B, C, SF III. Alfalfa hay, SW, C, B, SF
Non-rotational BMPs	Shelterbelts, buffer strips, reclaimed wetlands, residue management

[1] Substitutions of crops occur based on expectations and include durum wheat, flaxseed, oats and reduction of summer fallow acreage.

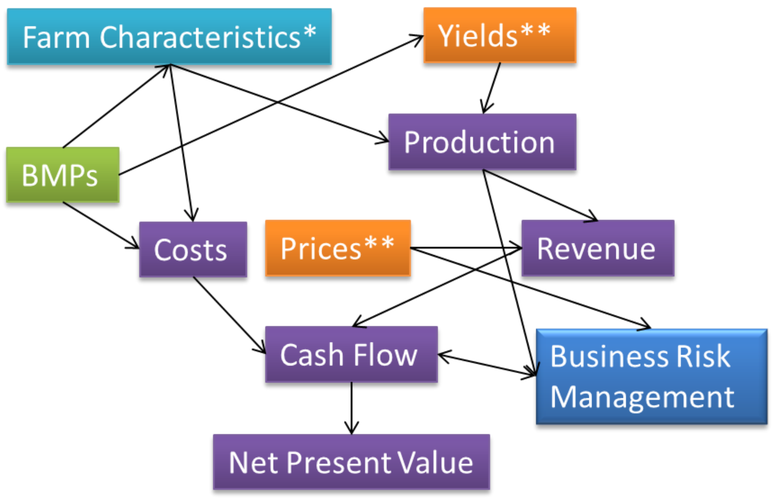
Table 2. Mixed enterprise characteristics

Location	Provost County, Dark Brown soil zone
Size	Crop: 648 hectares; forage: 648 hectares; pasture: 1,036 hectares
Herd (base)	400 cows, 25 bulls
Base rotation[1]	Spring wheat (SW), canola (C), barley (B)
BMP rotations[1]	I. SW, C, B, field pea II. Alfalfa hay, SW, C, B, SF
Non-rotational BMPs[2]	Aftermath grazing, swath grazing, riparian protection

[1] Substitutions of crops occur based on expectations and include durum wheat and oats. [2] In addition to the non-rotational BMPs listed in Table 1.

METHODOLOGY

Net Present Value (NPV) analysis with Monte Carlo simulation is used to model cash flow relationships (Figure 1) of representative farms.



* Farm characteristics includes enterprise type and other specifics.
** Stochastic variables.

Figure 1. Cash flow schematic

RESULTS

CROPPING ENTERPRISE

The baseline annualized mean NPV of the cropping operation is $106.10 per hectare. With participation in BRM programs specified under *Growing Forward* the value is $145.53 per hectare. Mean NPVs and standard deviation NPVs of these scenarios are provided in Table 3.

Table 3. NPV variable results

Scenario	Mean NPV	Standard Deviation NPV
Baseline	1,374,048	373,686
BRM	1,884,651	370,600

The annual adoption benefits per hectare of selected BMPs, with and without BRM participation, are provided in Figure 2.

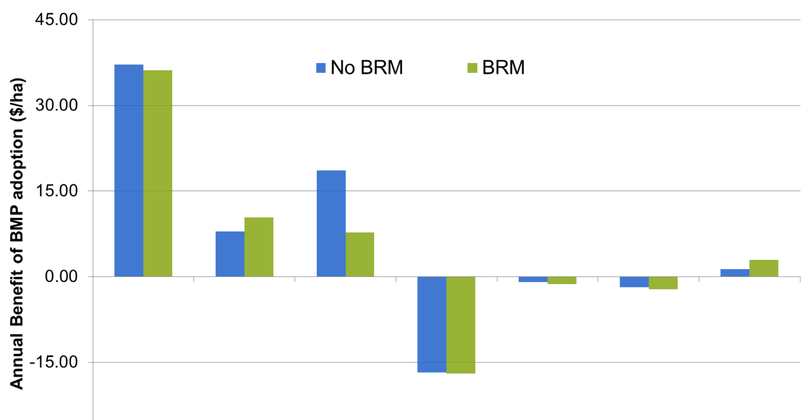


Figure 2. Benefit of BMP adoption with and without BRM participation

RESULTS

MIXED ENTERPRISE

The baseline annualized mean NPV of the mixed operation is $50.79 per hectare. With participation in *Growing Forward's* BRM programs the value is $66.90 per hectare. Mean NPVs and standard deviation NPVs of these scenarios are provided in Table 4.

Table 4. NPV variable results

Scenario	Mean NPV	Standard Deviation NPV
Baseline	1,184,011	267,696
BRM	1,559,452	255,128

Figure 3 shows the adoption benefits of selected BMPs with and without BRM participation.

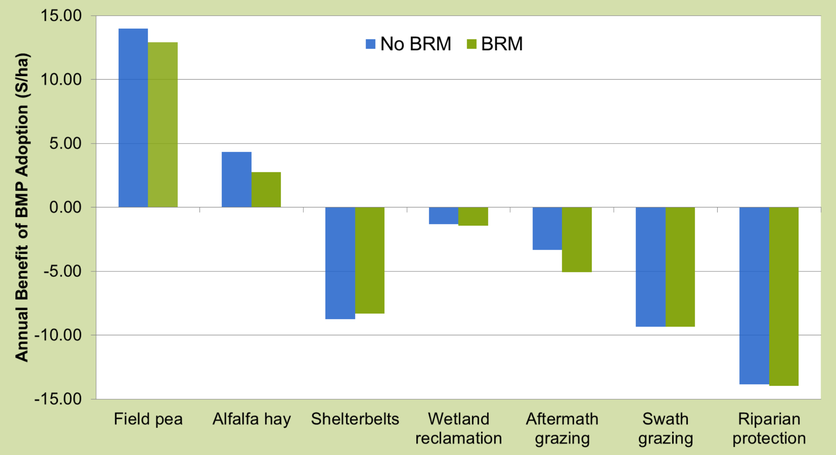


Figure 3. Benefit of BMP adoption with and without BRM participation

POLICY IMPLICATIONS

- In general, BMPs that remove land from production are costly and participation in BRM programs increases the net cost. Greater incentives for adoption of these practices may be necessary, which has cost implications for policy programs.
- Alternatively, participation in BRM programs further improves the farm wealth when certain crop rotation BMPs are adopted. For adoption of BMPs with net benefit further policy incentives are unnecessary and adoption levels may be improved with extension efforts.
- Goals of *Growing Forward* included BRM programs to mitigate producer risk, but also an environmental initiative; further planning could ensure better harmonization of objectives.

ACKNOWLEDGEMENTS

This project is funded by Alberta Land Institute
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