

Nutrient Management and Changing Farm Practices in Southern Ontario Watersheds



Presented by:

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This Study's Purpose

- ❑ To determine the extent to which farmers have been participating in conservation programs, adopting & implementing BMPs.
 - ❑ To discover farmers' views about voluntary & regulatory programs and whether they feel they should be paid for producing Ecological Goods & Services.
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Two Faces of Farming

- ❖ Sparling and Laughland (2006) have analyzed the 36,457 Southern Ontario farms & found: mainly *large* and *small* farms;
 - ❖ 27% of ON farms have >\$250,000 sales/year (ie. 80% of all farm sales + 90% of profits);
 - ❖ Small farm viability depends on mainly on off-farm work, not much from farming or government payments.
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Ontario Farm Types & Revenues

2004 Farm Financial Survey, Statistics Canada

Farm Types

Oilseeds & grain: 35%

Dairy: 33%

Poultry & eggs: 17%

Fruit & Vegetables: 6%

Beef: 5%

Hogs: 2%

Greenhouse/nursery: 2%

Other...

Revenues > \$1/4 M

1. Dairy: 32%

2. Grains & oilseeds:
16%

3. Poultry & eggs: 11%

4. Hogs: 9%

5. Greenhouse/nursery:
7%

6. Fruit & Veg: 6%

Sample Hypotheses

- Predicted that the larger farms would have a higher BMP adoption index; ie. numbers of BMPs adopted: Adoption Rate Index (ARI);
 - The higher the Gross Farm Sales, the higher the ARI;
 - The closer farmers are to urban areas, the higher the ARI of BMPs;
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Sample Hypotheses (cont'd)

- 4. The more full time the farmer, the higher the Adoption Rate Index (ARI);
 - 5. The better the sub-watersheds' water quality, the higher the ARI;
 - 6. The more the farmer has participated in the EFP and Nutrient Management Planning, the higher the ARI.
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This Survey

- Used a random sample of 317 landowners stratified by the 'best' and 'worst' sub-watersheds of *Ausable Bayfield*, the *Grand & Lake Simcoe watersheds*;
 - Sampling error for each sub-watershed: 7-10% but only about 5-6% as a whole;
 - Ave. age 54; off-farm work significant for 55%.
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Findings

- ❑ 91% would like to be paid for producing Ecological Goods and Services;
- ❑ 46% had done peer reviewed Environmental Farm Plans (EFP); 77% had done some EFP;
- ❑ 35% were familiar with the ON. Nutrient Management Act (2002);
- ❑ 27% knew about the ON. Clean Water Act (06).

Voluntary, Collaborative, Regulative

- ❑ Farmers were strongly opposed to the regulation of farm practices (e.g. NMA) yet most supported the voluntary EFP.
 - ❑ By contrast, most Grand River rural non-farmers want farming to be regulated environmentally (Filson, 2004).
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Rural Farm, non-farm Conflict

- Considerable tension exists between government regulation of how privately owned farms are managed when they can have an impact on common property resources.

One illustration of this tension:



Data Analysis

- Descriptive & Inferential Statistics;
 - E.g. Two Logistic Regression Models were constructed to explain the data: one with ARI (not as good) & the other with GFS (best fit) as the dependent variables.
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GFS Logistic Regression Model

- Gross Farm Sales = $f(\text{education, off farm income, gender, age, best and worst sub-watersheds, total land farmed, Adoption Rate Index})$;
 - The Nagelkerke R^2 of this model is also very good. The R^2 has a value of 0.708 which suggests that about 71% of the variation in the gross sales of the sampled farmers is explained by this model.
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Table 1: Factors that Affect **Gross Farm Sales**

(** below indicates statistical significance at the .01 level)

	B	S.E.	Wald	df	Sig.	Exp (B)
Watersheds	-.277	.429	.417	1	.519	.758
Age	-.072	.018	15.262	1	.000**	.930
Gender	-.052	.659	.006	1	.937	.949
Off-farm income	-2.358	.459	26.424	1	.000**	.095
Education	-.187	.572	.107	1	.744	.829
Total land farmed	.011	.002	23.840	1	.000**	1.011
Adoption Rate Index	5.197	1.384	14.108	1	.000**	180.801
Constant	1.501	1.17	1.623	1	.203	4.487

Findings (continued)

- Multicollinearity is generally not a problem when the VIF (variance inflation factor) is less than or equal to 4. VIF is the reciprocal of tolerance ($1 - R\text{-squared}$). If we take our pseudo $R\text{-squared}$ to be $R\text{-squared}$ then $VIF = \frac{1}{1 - 0.708} = 3.42$.
 - T-tests, ANOVA, etc. showed that farm size, gross farm sales, having an EFP &/or a NMP, farming full time & operating a large livestock operation were significantly related to higher adoption rates of BMPs.
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Other Findings

- Farmers' proximity to cities &/or CAs, their gender and education however, were not significantly related to the BMP Adoption.
 - Most farmers' perceived Quality of Life declined between 2001 & 2006.
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Summary and Conclusions

- ❑ Farm size, gross farm sales, the implementation of EFPs and NMPs and being a full time farmer tend to go hand-in-hand with the adoption of environmental BMPs.
 - ❑ Farmers with good management practices (higher BMP adoption rates) and larger farms tend to have bigger sales.
 - ❑ Environmental programs have to find better ways to influence small farm operators to adopt BMPs as financial and technical adoption incentives are perceived by them to be inadequate & they often lack time to implement BMPs.
 - ❑ These results do not imply causation, merely correlation.
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A Consideration

- Ontario farmers want to be paid for producing Environmental Goods and Services but will resist *cross-compliant regulation* which ties farm payments to environmental audits as in the EU and to some extent in Quebec.
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References

- Filson, G., S. Sethuratnam, B. Adekunle & P. Lamba. 2006. *Nutrient Management and Changing Farm Practices in Southern Ontario Watersheds*. MOE Report, Univ. of Guelph.
 - Filson, G. C. 2004. Social Implications of Intensive Agriculture. In Filson, G. C. (ed.) *Intensive Agriculture and Sustainability: A Farming Systems Analysis*. Vancouver: UBC Press. Pp. 34-50.
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Interested in reading the paper?

- If you'd like a copy of the paper, I have some here. If you don't get one, send me an email at gfilson@uoguelph.ca and I'll send it to you.
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