Pesticide Risk Reduction Program

Innovative and Sustainable Pest Management

Reducing Pesticide Risk and Measuring the Success of IPM Adoption in Canada

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5th International IPM Symposium

Wednesday, April 5, 2006

Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada

Canada

The Pest Management Centre Agriculture and Agri-Food Canada

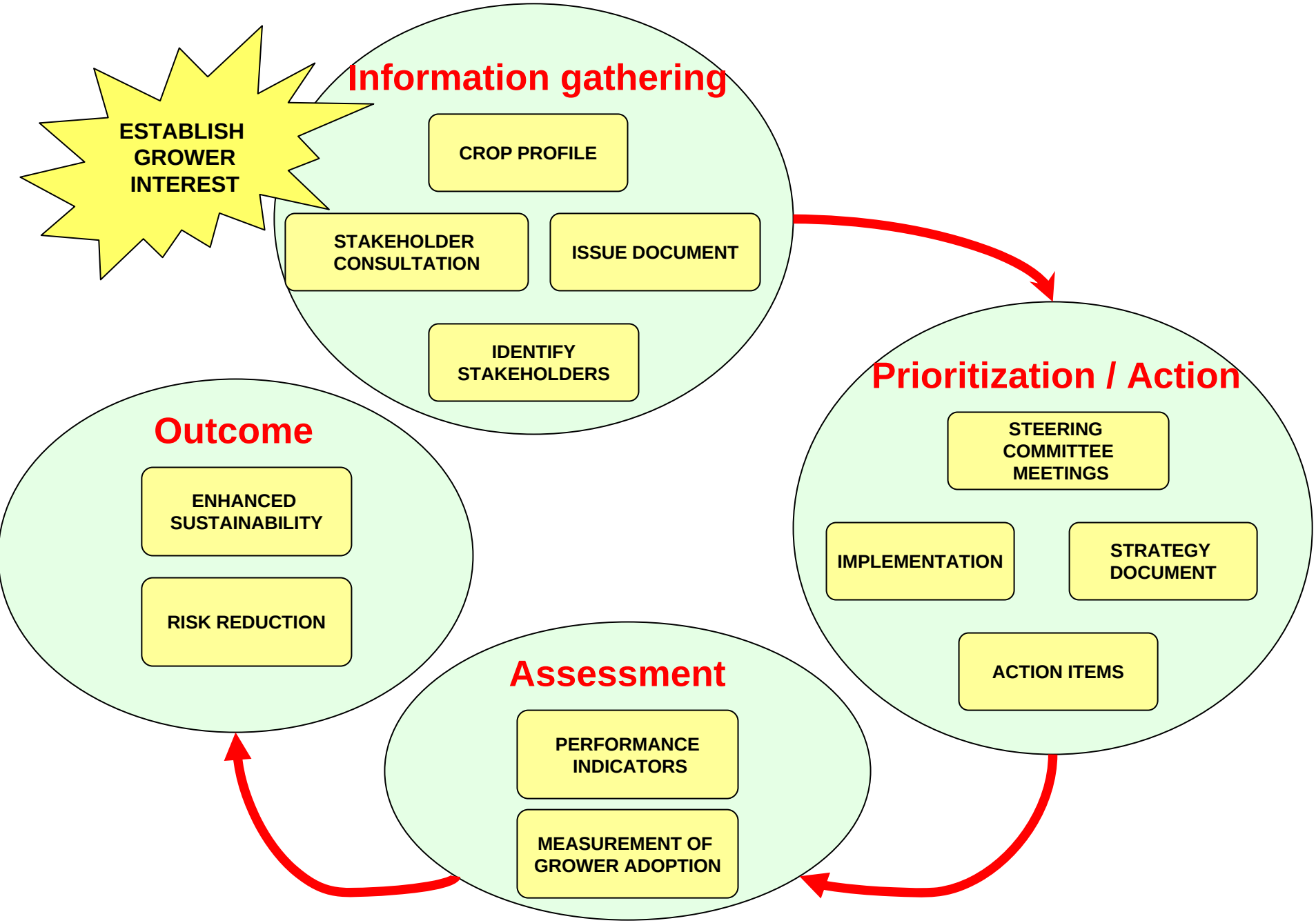
- Created in 2003
- Part of the Agricultural Policy Framework (APF)
- Three programs
  - Minor Use Pesticides
  - Minor Use Research
  - Pesticide Risk Reduction

The Pesticide Risk Reduction Program

- Cooperatively managed by AAFC and PMRA
- Develop commodity specific risk reduction strategies
- Providing funding for projects
  - Research
  - Education
  - Demonstration
- Providing a link between the growers and the regulator

Key Attributes of the Program

- National in scope and perspective
- Voluntary, grower led process
- Success depends on the participation of proactive grower organizations


ESTABLISH GROWER INTEREST
Information gathering
CROP PROFILE
STAKEHOLDER CONSULTATION
ISSUE DOCUMENT
IDENTIFY STAKEHOLDERS
Prioritization / Action
STEERING COMMITTEE MEETINGS
IMPLEMENTATION
STRATEGY DOCUMENT
ACTION ITEMS
Assessment
PERFORMANCE INDICATORS
MEASUREMENT OF GROWER ADOPTION
Outcome
ENHANCED SUSTAINABILITY
RISK REDUCTION

Status of Progress: Priority Crops

Crop	Published Crop Profile	Prioritized Issues Document
carrot	Yes	Yes
onion	Yes	Yes
pulses (4)	Yes	Yes
wheat	Yes	Yes
soybean	Yes	Yes
field corn		Yes
apple	Yes	Yes
canola	Yes	Yes
GH vegetables (4)	Yes	Yes
grape	Yes	Yes
peach	Yes	In progress
potato	Yes	Yes
strawberry	Yes	Yes
sweet corn	Yes	In progress

Status of Progress: Strategy Development

Crop	On-going	Getting started
carrot		Yes
onion		Yes
pulses (4)	Yes	Work in progress
wheat		Yes
soybean		Yes
field corn		Yes
apple	Yes	Work in progress
canola	Yes	Work in progress
GH vegetables (4)		Yes
grape		Yes
peach		Consultations started
potato		Yes
strawberry		Yes
sweet corn		Consultations started

Risk Reduction Strategy Support

Three funding initiatives

- Pesticide Risk Reduction Strategies
- Minor Use Research
- Biopesticide Support

Success Stories:
Apple and pear fire blight strategy

- Literature review
- Steering committee
- Strategy developed
- Key issues identified
- Joint EPA/PMRA review of two biopesticides
- Workshops on IPM held across the country

Innovative and Sustainable Pest Management
La Lutte antiparasitaire durable et innovatrice

Integrated Management of Fire Blight on Apple and Pear in Canada

Agriculture and Agri-Food Canada / Agriculture et Agroalimentaire Canada

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What is fire blight?

Fire blight, caused by *Erwinia amylovora*, is a bacterial disease of apple, pear, hawthorn, crabapple and ornamentals in the Rosaceae family. The disease can result in the loss of branches and tree structure. In severe cases, when the bacteria progresses into the trunk or infects the rootstock, entire trees can be killed. The severity of disease is dependent on cultivar and rootstock susceptibility, general tree health, cultural practices and environmental conditions. Economic losses to fire blight occur due to a loss of fruit-bearing surface and tree mortality. Trees may need to be removed and replanted or, in severe cases, whole blocks of trees may need to be replaced.

What does fire blight look like?

The symptoms of fire blight depend on the part of the part of the tree that is attacked. *Blossom blight* (Figures 1 and 2) results in blackened/shriveled blossom clusters. *Shoot blight* (Figures 3 and 4) is characterized by the typical "shepherd's crook" symptom. *Cankers* (Figures 5, 6 and 7) form once fire blight progresses into larger branches, trunk and the rootstock. Cankers are typically smooth edged when first formed, but the margins become cracked and more pronounced with time. Infections can also be identified by the discharge of bacterial ooze from infected plant surfaces.

Where does fire blight come from?

Fire blight bacteria overwinter in cankers or strikes on host trees. In the spring, the bacteria can multiply very quickly, causing the surfaces of cankers to ooze bacteria. Bacteria are spread to blossoms by insects (e.g. flies, honeybees) and splashing rain. Rainfall, high relative humidity and/or dew allow the bacteria to travel into the stigma of flowers and into the tree. Blossom infections often result in shoot infections later in the season.

How do I save my trees once they are infected with fire blight?

There is no cure for fire blight, but the spread of bacteria can be limited by using sound pest management strategies in an integrated management program. Such a program should include diligent pruning to remove cankers in the winter, pruning during the growing season the removal of blight symptoms as they appear, a balanced nutrition program and the use of prediction models to determine appropriate timing for the application of control products to limit the spread of the disease.

How do I avoid problems with fire blight in the future?

Today, the trend is to plant higher density orchards with more valuable cultivars (many of which are highly susceptible to fire blight), making it difficult to avoid the disease all together. Risks can be minimized by selecting cultivars and rootstocks carefully when planting new orchards (a list of the susceptibility of some common cultivars and rootstocks is included in this publication). Sites chosen for orchards should have well drained soils with a pH between 5.5 and 6.5 and have adequate organic matter. The application of excess nitrogen should be avoided. An integrated pest management program for sucking-piercing insects (e.g. leafhoppers, aphids, plant bugs) should be implemented. An annual pruning program to remove as many fire blight cankers as possible is critical. The use of control products (copper or Bordeaux mixture before buds open, streptomycin for blossom blight control in combination with a prediction model to time bloom applications) will help limit disease spread. The use of Apogee® in mature bearing trees where blossom blight has been detected may help reduce susceptibility to the disease. With all the different factors involved in fire blight management, integrated pest management strategies are essential.

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Blossom Blight

Shoot Blight

nfections

Tracking Success

- Why measure pesticide use and IPM adoption?
- What sources of data are already available?
  - Provincial surveys
  - Private surveys
  - Sales information
  - Statistics Canada Surveys
  - Research surveys
- Consulted with other Federal government departments regarding data needs

Development of a new survey

- Available data did not meet requirements
- Decided to develop a new survey:

  Crop Protection Survey (CPS)

- Designed to measure pesticide use and IPM adoption

Considerations

- Respondent burden
- Accuracy, complexity and cost
- Qualitative practice selection and integration
- Quantitative measurements
- Linkages

Methods used to measure IPM adoption

1. Count the practices
2. Intensity of pesticide use
3. Response to system change

Response to system change

- System changes :
  - Pests, strains, pest pressure
  - Pesticide registrations (regulations and business decisions)
  - Varietal resistance
  - Pest resistance
  - Tactics or strategies for suppression or control
- Possible responses :
  1. Increase reliance on moderate to high-risk pesticides with little change to IPM system
  2. Increase the number and complexity of pest management practices

Survey methodology

- Winter 2005/06
  - apple, carrot and grape
- Face-to-Face interviews
- Done at the growers home or business
- 45-60 minutes in duration
- Ask growers to have records on hand
- Grower association support

2005 Crop Protection Survey
Apple Growers

- Date
- Product
- Rate
- Method
- % crop treated

STEP 3: Questions about herbicide, insecticide or fungicide applications from January 1 to December 31, 2005 on the orchard selected in Step 2

15 What chemicals were applied to the selected orchard in 2005? Report ALL CHEMICAL APPLICATIONS to the SELECTED ORCHARD in this table.
Include all applications to the SELECTED ORCHARD (Step 2) made by the respondent, a partner, an employee or a custom applicator.

- *Where necessary, use supplemental tables in the Interviewer Booklet.*
- *For pre-packaged mixes, enter the product code found in the Interviewer Booklet.*
- *If the respondent mixed more than one product in the tank, use a different line for each product mixed.*
- *If the code of a pre-packaged mix is not included in the list, report its name at the bottom of this table (p. 4).*

Line	Column [1] Date of application	Column [2] Which product was applied? (Enter product name or code from the Interviewer Booklet)	Column [3] What was the rate of application? (e.g. 1 litre per acre)	Column [4] What was the application technique? (Enter the application technique code p. 4)	Column [5] If this application was a band or half row treatment, what percent of the ORCHARD was treated?
1	D D M M		per		
2	D D M M		per		
3	D D M M		per		
4	D D M M		per		
5	D D M M		per		
6	D D M M		per		
7	D D M M		per		
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19	D D M M		per		
20	D D M M		per		
21	D D M M		per		
22	D D M M		per		
23	D D M M		per		
24	D D M M		per		

- Perception of pest pressure

17 In 2005, for the selected orchard, was the incidence of INSECTS compared to the last five years ...? 814

(Check one circle only.)

1 ○ **Much less** 2 ○ **Less** 3 ○ **About the same**
4 ○ **More** 5 ○ **Much more**

If the answer is "More" or "Much more", continue to question 18. Otherwise → Go to Question 19.

- Plans for next season

18 What do you plan to do during the next growing season to reduce your INSECT problems? Will you ...? *(Check all that apply)*

815 ○ **Scout for insect or damage presence**
816 ○ **Use forecasting systems**
817 ○ **Switch to a different insecticide**
818 ○ **Apply an additional insecticide**
819 ○ **Take actions to disrupt insect reproduction or development**
820 ○ **Increase rate of insecticide applications**
821 ○ **Other, specify:** _____ 822
_____ 823

- New pests

19 In 2005, did you deal with any NEW INSECTS in this field? 824

2 ○ **No** 1 ○ **Yes**

► **If yes, what was the main insect?** _____ 825

- What was done to control this most prevalent pest?

20 In 2005, for the selected orchard, what was the MOST PREVALENT INSECT you had to control?

If there was no significant insect problem, enter "0" and skip to Question 22. 826 _____

21 What did you do to control the MOST PREVALENT INSECT? Did you ...? *(Check all that apply.)*

827 ○ **Apply insecticides throughout the growing season**
828 ○ **Time insecticide applications to target the insect at different development stages**

What were the developmental stages?
If not applicable, go to next choice: Box 832

829 ○ **Early nymph or egg stages**
830 ○ **Larval or nymphal stages**
831 ○ **Adult**

832 ○ **Take other steps to disrupt the reproduction of this insect**
833 ○ **Take other actions to disrupt the morphological development of this insect**
834 ○ **Release beneficial organisms to control this insect**
835 ○ **Manage this orchard and its surrounding area to attract beneficial organisms**

- Actions taken to prevent resistance development
- Perception of resistance

31 In 2005, did you use any of the following practices to prevent weed, insect and disease resistance to chemical products? Did you …?

(Check all that apply.)

879 ○ **Always rotate chemical families (*or groups*)**
880 ○ **Select more pest resistant crop varieties**
881 ○ **Sometimes rotate chemical families (*or groups*)**
882 ○ **Reduce pest populations through non-chemical means**
883 ○ **Other, specify:** _____ 884

32 On YOUR FARM, to what extent, if any, are weeds becoming resistant to HERBICIDES? Are they becoming …?

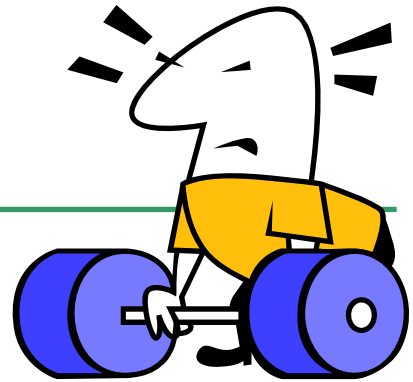
(Check one circle only.)

1 ○ **Very resistant** 2 ○ **Resistant** 3 ○ **Slightly resistant** 4 ○ **Not resistant** 9 ○ **Don't know** 885

Results

- Data will be available in July, 2006
- Comparison with other data sources
  - Purchased data sets
  - Focus group “expert poll” data
  - Interview “expert poll” data
  - Sales data
  - Crop insurance data

Improvements



- Debriefing sessions with interviewers
  - Survey well received
  - Respondent burden a concern
  - Improvements are suggested
- Analysis of results

Next steps

- Published results
  - Statistics Canada publication
  - Crop Profiles to be updated
- Plan for winter 2006/07 survey
  - potato, canola and wheat

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Le Centre de la lutte antiparasitaire

www.agr.gc.ca/prrmup
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