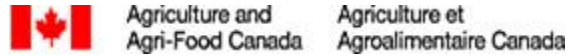


## Accelerating the Adoption of Integrated Pest Management and Risk Management Strategies in Wheat and Other Cereals

Support for this project is provided by:



Pesticide Risk Reduction Program  
Pest Management Centre  
[www.agr.gc.ca/prrmup](http://www.agr.gc.ca/prrmup)

Canada

in partnership with



The objective of this project is to accelerate the adoption of integrated pest management (IPM) and pesticide risk reduction (PRR) practices by Alberta cereal growers.

In November and December 2006, 285 farmers from four geographical regions in Alberta were surveyed to determine baseline adoption rates of IPM/PRR practices.

The survey was created with input from ARECA co-applicants, AAFC advisors, an AAFC Scientist specializing in farmer surveys, a consultant specializing in survey development and administration, and some farmer advisors. Surveyees were chosen using methods to ensure a random sample.

The survey results showed that many IPM/PRR practices are being utilized, but very few have high rates of adoption. As well, farmers struggle to have a clear understanding of IPM, with over 1/3 unfamiliar with the term integrated pest management.

Based on the survey results, three priority IPM/PRR practices were identified:

- 1) reducing pesticide use by increasing crop competitiveness through the use of competitive cultivars and seed treatments, and optimization of seeding date and rate
- 2) reducing pesticide risk (resistance) by practising herbicide rotation
- 3) reducing pesticide use and risk through effective field scouting

These three priority practices were chosen based on the following assumptions:

- 1) increased adoption would be of significant benefit to producers in all the regions
- 2) a difference in baseline and increased adoption could be measured
- 3) able to be written/spoken about, and/or put in research/demonstration trials and toured
- 4) current adoption rates were lower than expected
- 5) perception of practice effectiveness was lower than expected

Farmers indicated that their top three preferences for receiving information are:

- 1) printed information
- 2) attending a presentation or workshop
- 3) on-farm demonstration

Therefore, these are the extension methods that were chosen for emphasis in the upcoming 2007 extension events to promote IPM/PRR practice adoption.

A variety of ARECA extension events are planned for 2007 throughout Alberta, including:

- 1) competitive ability of barley cultivars research and demonstration plots
- 2) demonstrations featuring herbicide rotations and crop scouting
- 3) summer tours and diagnostic field schools featuring priority IPM practices
- 4) workshops and seminars featuring priority IPM practices
- 5) newsletter and other publication articles featuring priority IPM practices, which will be sent to tens of thousands of Alberta farmers
- 6) information on the ARECA website
- 7) the creation and distribution of colour brochures featuring priority IPM practices

Extension events will be planned for 2008, after evaluation of the success and effectiveness of the 2007 events. A follow-up survey will be conducted in November and December 2008, to measure whether the concerted extension efforts increased the adoption of priority IPM/PRR practices, and to ascertain which methods were most effective.

## **ARECA SURVEY SUMMARY – IPM/RRM IN CEREAL CROPS**

### **Alberta Provincial Results: 285 surveys**

Before today, were you familiar with the term “integrated pest management?” **Y171** N96

### **SURVEY QUESTIONS:**

1. What cereal crops do you grow? (*check all that apply*)

**246 = wheat** 147 = oats 218 = barley 29 = rye 26 = triticale 70 = other (*name*):  
durum 27 canola 8 CPS 2 Hay 1 Winter wheat 8 Peas 1 Mustard 1 Fall rye 1

2. What cereal crop do you grow the most?

**184 = wheat** 32 = oats 105 = barley 1 = rye 1 = triticale 12 = other (*name*)  
canola 1 durum 11 winter wheat 2

### **We are defining pests as insects, weeds and diseases**

3. What sort of pest management practices do you use?

<b>Crop rotation</b> 190	Pesticides 51	Herbicides 162
Field scouting 53	Seed treatment 38	Min/zero till 17
Cultivation 7	Summer fallow 4	Adjust seed dates 3
Chemical fallow 6	Agronomy Services 1	Gopher Poison 1
Grazing 2	Early seeding 1	Combination 4
Fungicides 9	Tillage 8	Perennials 3
Silage 3	Variety rotation 1	Early cutting 2
Minimize spraying 1	Fertilizer 2	Heavy seed rate 3

Economic threshold 6	Herbicide/pesticide rotation 3	Plow down 1
Burn off 2	Mow edges 2	Chemicals 38
Natural 3	Spraying 13	Pre-seed 3
Crop stocking 1	Timing 3	Weed control 2
Good seed stock 3	Fertility mgt 18	Resistant varieties 4
Tall stubble 1	Insecticides 13	Direct seeding 1
Winter wheat 1	Irrigation 2	Biological inputs 1
Varietal selection 6	Cultural 1	Organic insect control 1
Fall plowing 2	Roundup 1	Hay/pasture 4
Post harvest 1	Seed rate 5	High clearance sprayer 1
No fungicides 1	Insect check strips 1	All 1

4. Which pest management practice(s) do you prefer?

<b>Crop rotation 109</b>	Pesticides 14	Herbicides 52
Field scouting 15	Seed treatment 6	Min/zero till 11
Cultivation 4	Summer fallow 2	Chemical fallow 1
Agronomy Services 1	Early seeding 1	Combination 25
Tillage 1	Perennials 2	Early harvest 1
Minimize spraying 4	Fertilizer 1	Seed rate 2
Economic threshold 1	Herbicide rotation 1	Plow down 1
Burn off 1	Chemicals 24	Natural 7
Spraying 26	Pre-seed spraying 1	Fertility mgt 5
Resistant varieties 1	Insecticides 3	Organic insect control 1
Hay/pasture 4	High clearance sprayer 1	Seeding mgt 1
Reduce insecticide use 1	Most cost effective 3	Most profitable 1
Min. intrusion 1	Less spraying 4	No problems 1
None 2	All 2	Depends on pest 1
Insect check strip 1	Delayed seeding 1	

5. Which pest management practice has given you the best results?

<b>Crop rotation 79</b>	Pesticides 8	Herbicides 55
Field scouting 14	Seed treatment 5	Min/zero till 7
Cultivation 1	Summer fallow 1	Adjust seed dates 1
Chemical fallow 1	Gopher Poison 1	Early seeding 1
Combination 6	Fungicides 2	Tillage 4
Perennials 1	Variety rotation 1	Early harvest 1
Fertilizer 1	Seeding rates 2	Plow down 1
Burn off 1	Mow edges 1	Chemicals 29
Natural 1	Spraying 50	Pre-seed spray 1
Chemical rotation 2	Good seed stock 1	Fertility mgt 3
(Resistant) varieties 2	Insecticides 3	Direct seeding 2
Winter wheat 1	Varietal selection 5	Cultural 1
Organic insect control 1	Hay/pasture 2	Pre & post herbicides 2
Weather 2	Weed control 6	None 3
Depends on pest 1		

6. What three factor(s) **most** determine your choice of pest management practice?  
 218 = cost 95 = time 63 = quick results 138 = high yield 65 = higher selling price  
 154 = long-term gain 108 = safer/healthier for me 91 = better for the environment

7. I will now name several pest control practices. Please tell me which of these you have tried and how often you use them? *rank frequency of use (1=never, 2=rarely, 3=sometimes, 4=often, 5=always)*

herbicides 1/6, 2/3, 3/7, 4/61, 5/209

insecticides 1/46, 2/93, 3/100, 4/21, 5/26

- Seed treatments or foliar applied? *Seed Treatment 119 Foliar 67 Both 8*

Fungicides 1/62, 2/50, 3/69, 4/ 55, 5/ 59

- Seed treatments or foliar applied? *Seed Treatment 141 Foliar 46 Both 19*

rodenticides (rodent poisons) 1/119, 2/65, 3/53, 4/13, 5/18

variety selection (selecting resistant or tolerant strains) 1/32, 2/16, 3/58, 4/96, 5/81

- Selecting competitive crops or varieties? Y 216 N 26

seed selection 1/12, 2/9, 3/28, 4/70, 5/162

- if yes, do you do seed testing? Y 264 N 14 home=24 lab=159 both=55

- if yes, germination Y 264 N 10; vigour Y 215 N 52; disease Y 186 N 76

crop rotation 1/2, 2/1, 3/3, 4/74, 5/205

integrated fertility management 1/9, 2/26, 3/83, 4/51, 5/99

- soil test? Y 248 N 24 micronutrients? Y 133 N 145

- foliar applied? Y 50 N 197 fertilizer placement? Y 236 N 43

- application timing? Y 129 N 108

seeding management 1/16, 2/11, 3/26, 4/41, 5/177

- seeding depth? Y 235 N 39 seeding rate? Y 249 N 22

crop scouting 1/3, 2/2, 3/37, 4/68, 5/122

- do you use GPS? Y 116 N 169

- do you use a sweep net? Y 174 N 111

- do you use economic thresholds? Y 220 N 65

- do you scout in order to reduce pesticide use? Y 240 N 45

rotating pesticide groups/ classes 1/23, 2/13, 3/34, 4/77, 5/131

adjusting planting or harvesting dates to avoid pests 1/91, 2/50, 3/56, 4/36, 5/75

using cultural or mechanical weed control 1/75, 2/55, 3/75, 4/41, 5/32

using spot spraying/spraying field edges 1/47, 2/49, 3/78, 4/49, 5/58

flexible tillage practices 1/28, 2/15, 3/36, 4/63, 5/127

- Minimum or zero tillage? Y 218 N 23

record keeping 1/10, 2/21, 3/27, 4/48, 5/164

- If yes, what types of records do you keep? Manual/written 58

Variety 14	Fertilizers 37	Seed/crops 28	Weeds 10
Chem/spray used 76	Yields 35	Rates/dates of spray 52	
Seeding dates 34	Seeding rates 14	Harvest dates 19	Soil temp 6
Crop rotation 18	Straw mgt 4	Crop insurance 1	Computer 20
Tillage 6	Field maps 6	Field notes 52	Water 2
Soil testing 3	Daily conditions 1	Memory 12	Crop history 6
Financial 6	Pest pressure 2	Product Info 1	Weather 2
General info 8	Fertility 1	Production 9	All 2 Poor 1

cleaning implements between fields/ after field work 1/27, 2/40, 3/68, 4/54, 5/83

- If yes, what implements (e.g. combine, tillage equipment)?

Combines 121	Cultivators 31	Seeders/seed drills 51	Sprayer 9
Trucks 6	Harrow 4	Swather 27	Auger 1
Tillers 42	Baler 2	Harvester 2	All 40

8. Which of the practices you have used have brought you the best results?

<b>Crop rotations 94</b>	Herbicides 43	Field scouting 23
Chemicals 23	Spraying 22	Tillage 7
Combo 11	Seed selection 6	Zero till 44
Variety selection 6	Fertilizer mgt 2	Direct seeding 4
Clean equipment 4	All 15	Fertilizer 4
Soil testing 2	Seeding timing 9	Chemical rotation 16
Summer fallow 4	Insecticides 2	Pre-harvest spray 1
Silage 1	Cultural 1	Fall plowing 3
Consultants 1	Mgt 1	Cultivation 1
Record keeping 3	No 5	n/a 12
Fungicides 1	On-farm trials 1	Peas 1
Canola 1	Spot spraying 21	Winter wheat 1
Seed treatment 1	Chemical fallow 1	Cows 1
One pass seeding 1	Monitoring disease 1	Pulse 3
Seeding mgt 1	Staging 1	Timing 3
Fertility mgt 6	Common sense 1	Pesticides 5
Weed control 2	Reducing pesticides 1	Planning 1

9. Have you tried any practices that had poor results?

Crop rotation 5	Soil testing	Weather timing 5
Spraying 7	Zero till 5	Wheat on wheat 1
Soils 1	Tillage 8	Low seed rates
Fungicides 3	Micronutrients 1	<b>Chemicals 9</b>
Canola 4	Insecticides 9	Economic threshold 1
Timing 8	Weed control 1	Foliar w/fungicides 1
Herbicides 8	Broadcasting 2	Gov. red tape 1
New varieties 4	Spot/less spray 5	Late seeding 3
Direct seeding 1	Deep seeding 1	Cultural 1
Pulse 1	Seed bed prep 1	Wild oat control 1
Low seed rate 1	Less fertilizer 1	Lower threshold levels 1
Zero till on irrigation 1	Seed mgt 4	Summer fallow 2
Pesticides 4	Fertilizer 3	Overworked land 1
Residue spreading 1	Grazing 1	Chickpeas 1
Stubble height 1	Yes 16	<b>No 63</b> N/A 5

10. Which of the practices you have used have been the most cost-effective?

<b>Crop rotation 63</b>	Seed selection 5	Zero/min till 27
Insecticides 1	Varied rate application 1	Pre-seed burn off 2
Not burning 2	Direct seeding 12	Herbicides 47

Reduced till 9	Seed treatment 6	Summer fallow 3
Organics 1	Fertility 2	Variety selection 6
Spot spraying 4	Early spraying 2	Seeding rate 2
Chemicals 23	Field scouting 20	Summer fallow 1
Biologicals 1	Perennials 1	Pesticides 2
Combo 1	Min. spraying 1	Fertilizer 17
Spraying 7	Early seeding 1	Tillage 3
Timing 12	Straight combine 1	Cut before weeds reseed 1
Reduced herbicide 1	Shallow cultivation 2	Plow down 1
Adjust seeding dates 1	Soil testing 1	High clearance sprayer 1
Intensive Silage 2	Clean Equipment 1	Record keeping 2
Mgt 1	Canola 1	Early red clover 1
Fungicides 1	Cultural 1      All 1	All cost money 1

11. Have you tried any practices that you felt cost you money?

Yes 31	No 62	Don't know 12
Crop rotation 4	Lack of organization 2	Field scouting 1
Insecticides 1	Herbicide rotation 6	Some herbicides 13
Pesticides 1	Fungicides 16	Chemicals 18
Crop choice 1	Summer fallow 10	Spraying 9
Late spraying 2	Incorrect spraying 2	Spray timing 2
Not spraying 1	Canola 1	Soil additives 1
Micronutrients 2	Copper 1	Fertilizer 12
Reduced fertilizer 2	Lack of moisture 1	Adjust planting dates 1
Underseeding cereals 1	Seed treatments 7	Bad seed 2
Direct seeding 1	Deep banding fert seeding 1	Tillage 9
Fall tillage 1	Zero tillage 5	Mech weed control 1
Fall dessication 1	Swath grazing 1	Combining seeds 1
Fertility mgt 1	Fertilized hay 1	Reliance on inputs 1
Seeding winter wheat and barley together 1		

12. Is anything preventing you from greater adoption of IPM practices?

Cost 79	Time 32	Tradition 1	Family size 1
Education 9	Growing season 1	Soil type 1	Labour shortage 1
Yields 2	Equipment 5	Climate 1	Lack of mapping 1
Paperwork 2	Desire 1	Crop rotation 1	Seed production 1
Technology access 1	Health/enviro1	Need new trends 1	No pest problem 1
Not enough info 1	Low commodity prices 1	Neighbour's pests moving in 1	
Scattered land base 1	No room for experimentation 1		Risk 1
Near retirement 1	Soil moisture 1	No 111	

13. Do you think that IPM is a useful practice for farmers to use to manage pest issues?  
 strongly disagree 7 somewhat disagree 3 somewhat agree 75 strongly agree 190 don't know 5

14. Do you think that some IPM might increase your input costs?

strongly disagree 13 somewhat disagree 40 somewhat agree 133 strongly agree 92 don't know 7

15. Do you think that some IPM might decrease your input costs?  
strongly disagree 29 somewhat disagree 36 **somewhat agree** 143 strongly agree 69 don't know 19

16. Do you think that IPM is difficult to implement on your farm?  
**strongly disagree** 136 somewhat disagree 59 somewhat agree 72 strongly agree 7 don't know 12

17. Have you ever encountered pesticide resistance? Y 79 N 203  
If yes, did it make you try more IPM practices? Y 63 N 6

18. Would you like to know more about IPM? Y 217 N 57 N/A 5  
If YES, what is of particular interest to you?

Rotation 9	Seeding rates 2	Peas in rye 1	Crop variety 4
Reduced chemicals 1	Reduced costs 1	Cost efficiency 1	Returns 1
Field scouting 1	Concept of 1 pm 1	Econom thresholds 1	Safety 1
More options 2	<b>All 26</b>	New technology 2	Crop diagnostic schools 1
Seminars	Learn what others are doing 1		Benefits of insects 2
Rust prevention 1	Industry contamination 1		Environmental impacts 1
Wildlife control 1	Effects on soils 1	Fertility 3	Organic practices 2
Biologicals 2	Micronutrients 2	Disease 2	Fungicides 3
Insecticides 3	Pesticides 2	Chemicals 2	Natural types 1
Herb. carry over 1	Weed control 3	Weed types 1	Sawfly control 2
Foliar application 2	Sprays 2	GPS 1	Research 1
			Unsure 4

19. How would you prefer to receive your information? (*yes or no*)  
Y 230 N 40 **printed information**, e.g. brochure Y 87 N 142 e-mail  
Y 121 N 10 specialist visit to my farm Y 97 N 127 web site  
Y 128 N 92 peer visit to my farm Y 163 N 69 on-farm demonstration  
Y 192 N 41 attending a presentation Y 182 N 56 attending a workshop  
Y 157 N 74 at a conference Y 145 N 77 one-on-one/off-farm

20. Would you like to receive a copy of the survey results? Y 232 N 49

21. We would like to do a follow up survey in two years. Would you be willing to participate again? Y 265 N 20

Type of farming operation: **Grain 127** Mixed 110 Cattle 9 Oilseeds 7  
Irrigation 6 Pulse 3 Feedlot 1 Forage/grass/alfalfa 6 Organic 1

Number of acres: less than 1000 = 43 **1000-1999 = 93** 2000-3999 = 89  
4000-5999 = 40 6000-7999 = 11 8000-9999 = 5 more than 10,000 = 6

Length of time farming (in years) less than 5 = 2 5-9 = 10 10-19 = 29  
20-30 = 78 **more than 30 = 128**

Is farming your main income source? **Yes 234** No 31