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Farm Inputs Management Survey, 1995

A survey of manure, commercial fertilizer
and commercial pesticide management
practices on Canadian farms

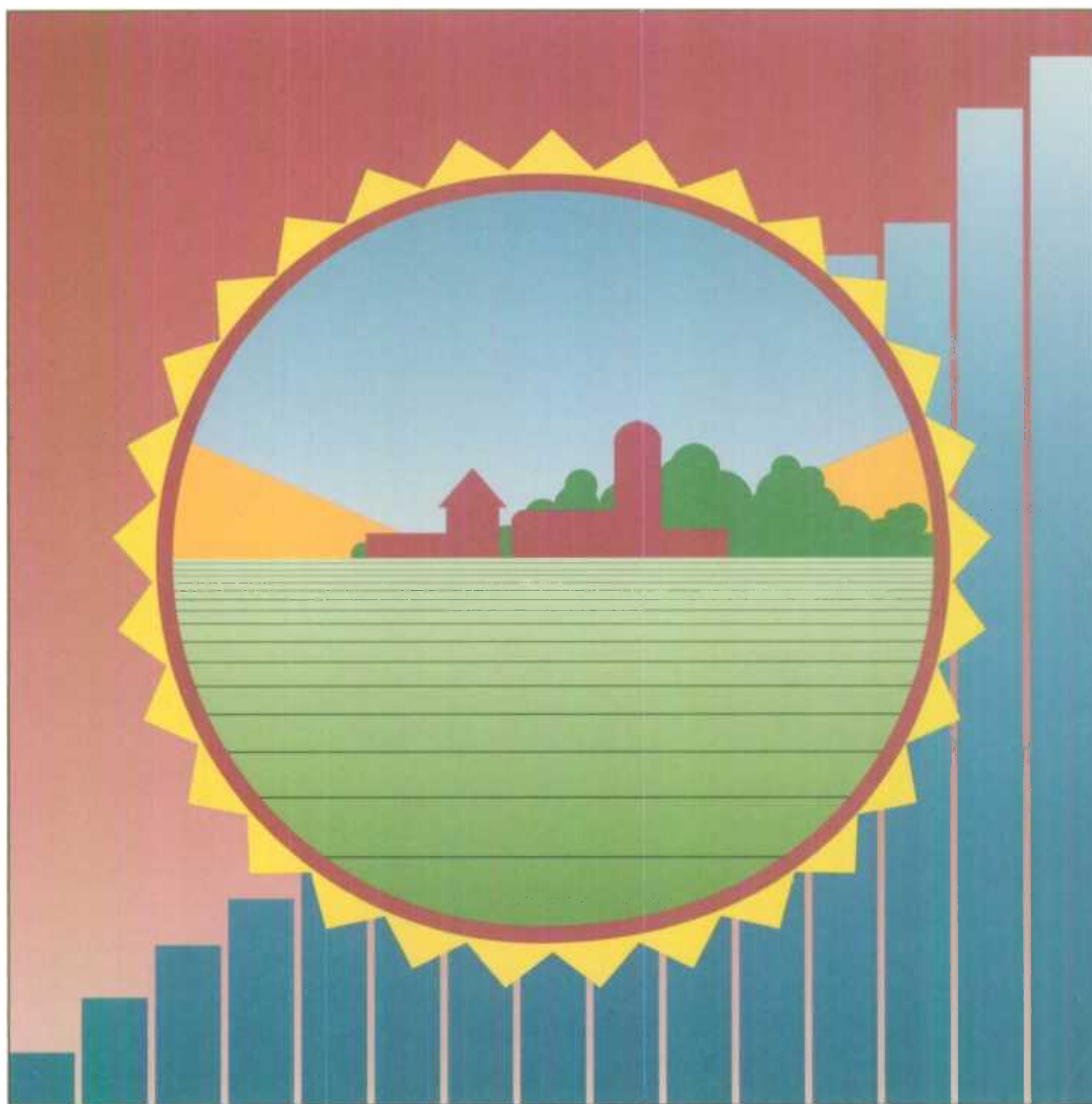
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Note of Appreciation

Canada owes the success of its statistical system to a long-standing cooperation involving Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued cooperation and goodwill.



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- EXECUTIVE SUMMARY -

This report describes the approach used to collect data on the adoption and use of selected farm input management practices on Canadian farms. The Farm Inputs Management Survey, an initiative by Agriculture and Agri-Food Canada and Statistics Canada addresses a data gap at the national level regarding the management of three farm inputs: manure, commercial fertilizers and commercial pesticides.

A total of 6,000 agricultural operators across Canada were surveyed from December 6-20, 1995. All farms in Canada (excluding the Yukon and Northwest Territories) in operation at the time of the survey were included in the target population with the following exclusions: farms with sales of agricultural products less than \$2,000, farms located on Indian reserves, institutional farms, community pastures, and multi-holding companies.

Data are available at the following geographic levels: Canada, Province, Ecozone and Ecozone within Province. Canada-level data summaries are provided in this report. Custom data requests by Province, Ecozone and Province/Ecozone are available on a cost recovery basis from Statistics Canada.

Highlights

Manure:

- 60% of Canadian farms reported having manure storage on the farm. The proper disposal of manure is therefore very important both from an environmental and productivity perspective.
- 95% of the farms which stored manure reported storage of manure in a solid or semi-solid state. 65% of these farms stored manure in an open pile without a roof.
- Manure storage capacity is an important aspect of managing manure on the farm. 40% of farms with liquid manure storage can store manure for more than 250 days indicating that the volume of wastes generated can be handled until weather, soil and crop conditions allow spreading.
- 13% of Canadian farms applied some manure in winter. However, the majority (two-thirds) applied 25% or less of their manure during the winter.

Commercial Fertilizers:

- 72% of Canadian farms applied commercial fertilizers in 1995. Over half (53%) applied fertilizers by broadcasting.
- Soil testing is the most important factor used by farmers in determining the amount and type of fertilizer to apply. About one-quarter of the farms also reported cost of fertilizer as being a factor.
- 60% of producers used soil tests. Of these, 75% soil tested either every year, or every 2-3 years.
- Manure is an important substitute for commercial fertilizers on Canadian farms. 65% of the land on which manure was applied did not have commercial fertilizers applied to it. Of those operators who used commercial fertilizers as well as manure, 83% reduced the quantities of commercial fertilizers on land on which manure was applied.

- The growing of legumes solely for ploughdown for nitrogen was reported by 15% of the farms.

Commercial Pesticides:

- In 1995, the use of herbicides for weed control was reported by 67% of the farms. Insecticide usage was reported by 31% of the farm operators. Only 19% reported using fungicides.
- 38% of those who applied herbicides decided the amount and type of herbicides to apply based on crop growth stage, while 26% based their decision on the first sign of weeds.
- 44% of those who applied insecticides or fungicides decided the amount and type of insecticides and fungicides to apply based on "Other" methods (most notably "with seed" and "experience") and 20% based their decision on the first sign of pests.
- 76% operated their own sprayer. Of these, 68% calibrated their sprayer at the beginning of each crop season.
- Of the operators that used pest control methods other than commercial pesticides, crop rotation (49%) was the most common. Tillage (26%) was the only other method of control used by a significant number of farm operators. 39% reported no alternative pest control methods.

- ACKNOWLEDGEMENTS -

This report and results of the Farm Inputs Management Survey were made possible by the efforts of many individuals within both Statistics Canada and Agriculture and Agri-Food Canada. Coordination and guidance were provided by Mario Ménard, Norah Hillary and Gwen Cromwell of Statistics Canada and by Dave Culver, Robert Koroluk and Mark Spearin of Agriculture and Agri-Food Canada. Within Statistics Canada, Jacques Lemieux from the Agriculture Division contributed valuable technical expertise to process the results. Other people from the Agriculture Division contributing to this project include: Jim Hines and his staff, Diane Matte, Rick Hall, Linda Bonenfant and Marco Morin. From the Business Survey Methods Division, Claude Poirier and Laurent Roy provided valuable methodological expertise. Thanks to Gord Buchan, Sharon McLinton, Yves Mayer and Suzanne Lavoie from the Survey Operations Division and the Regional Operations staff and interviewers in Winnipeg, Montreal and Sturgeon Falls. From the Questionnaire Design Research Centre thanks to Allan Gower and Anne Patry. Thanks to Louise Larouche and Sylvain Cloutier for their editing capabilities. Many thanks to the various scientists and expert individuals who provided their subject matter expertise as well as to the reviewers for providing valuable comments and suggestions.

Lastly, we would like to express our thanks to the farmers of Canada for responding to the Farm Inputs Management Survey. Without their cooperation, this report would not have been possible

FARM INPUTS MANAGEMENT SURVEY, 1995

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FARM INPUTS MANAGEMENT SURVEY, 1995

1.0 Introduction

How farm inputs are used and managed relates to sustainable agriculture in several ways. Improper use and application of inputs such as pesticides and crop nutrients can adversely affect on-farm resources such as soil productivity or water quality and off-farm resources such as water ecosystems or biodiversity. Manure disposal, fertilizer nutrient runoff and chemical contamination are major issues of public concern regarding agriculture and the environment. However, through the use of best management practices, agricultural inputs can be used in a manner which poses little or minimal risk to the environment while contributing to agricultural productivity, a safe food supply and farm financial health.

The **Farm Inputs Management Survey** is an initiative by Agriculture and Agri-Food Canada and Statistics Canada to address a data gap at the national level regarding the management of three farm inputs: manure, commercial fertilizers and commercial pesticides. The data that were collected on the adoption and use of selected management practices by 6,000 Canadian farmers will contribute to the Agri-Environmental Indicator Project being undertaken by Agriculture and Agri-Food Canada. This project supports the larger policy goal of integrating environmental considerations into decision-making processes at all levels of the agri-food sector. A core set of regionally-sensitive national indicators is being developed that builds on and enhances the information base currently available on environmental conditions and trends related to primary agriculture in Canada. The results of the Farm Inputs Management Survey make a significant contribution to this goal.

The Farm Inputs Management Survey also complements the questions on land management practices that were added to the Census of Agriculture for the first time in 1991. The questions track on-farm adoption rates of land management practices for tillage, erosion and weed control as well as the use of conservation structures such as windbreaks and grassed waterways. Building on the baseline created in 1991, a new question dealing with manure application methods has been added to the 1996 Census of Agriculture. Although not as comprehensive as the census, the Farm Inputs Management Survey provides data on the adoption and use of a further set of management practices regarding farm inputs for the same reference period.

2.0 Survey Content

2.1 Issues

The questionnaire was designed to respond to the following issues identified in consultation with Agriculture and Agri-Food Canada and other stakeholders:

Manure Management:

- Manure storage methods, capacity and location;
- Frequency and timing of manure applications.

Commercial Fertilizer Management:

- Fertilizer application methods;
- Methods used to decide the amount and type of commercial fertilizer to apply;
- Incidence of reducing amount of commercial fertilizer applied to offset nutrient content of manure applied;
- Incidence of reducing amount of commercial nitrogen applied to offset nutrient content of legume ploughdown;
- Frequency of soil testing.

Pesticide Application Practices (herbicides, insecticides, fungicides):

- Methods used to decide when to apply pesticides;
- Sprayer calibration practices;
- Use of alternative pest control methods.

Respondents were also asked to provide the following farm profile and demographic information:

Farm Profile Information:

- Land area: cropland, summerfallow, pasture, other;
- Livestock inventory, as of December 1, 1995;
- Farm type (51% or more of gross farm receipts);
- Gross farm receipts, 1994.

Demographics:

- Percent of income from farming;
- Age;
- Education level.

The full questionnaire may be found in Appendix A.

2.2 Content Testing

A questionnaire testing process helped to determine which of the proposed questions were viable in the proposed computer assisted telephone interview (CATI) environment. The objectives of the process were to:

- i) determine the respondents' ability and willingness (sensitivity, etc.) to correctly answer the questions proposed to be asked;
- ii) measure (qualitatively) respondent reaction to the issues and types of questions asked;
- iii) recommend an appropriate number of questions (length of questionnaire); and
- iv) provide information on the distribution of response variation across the country, helping to ensure that questions were interpreted similarly in different regions or under different cropping systems. In this way, the possibility of the survey yielding misleading results was to be minimized.

The content testing strategy was carried out using a combination of personal interviews and a telephone pre-test.

3.0 Collection

3.1 Timing of Collection

The survey was conducted from December 6-20, 1995. With harvest completed, this time was less hectic for producers than other times of the year, and still soon enough after the crop season that facts about various practices used during the season could still be remembered. As a result, the response rate was high (see section 4.1.4 Sample Allocation) because most farm operators were available to conduct the interview. Other benefits included comparability with the results of the 1996 Census of Agriculture (same reference period).

3.2 Data Collection Vehicle

The survey was conducted using the computer assisted telephone interview (CATI) approach that had been tested.

4.0 Methodology

4.1 Sampling Plan

A larger sample size enables reporting at lower geographic levels. However, survey costs are directly related to the number and complexity of questions, the number of observations (sample size), and the collection vehicle to be used.

4.1.1 Target Population

The target population of the Farm Inputs Management Survey consisted of all farms in Canada (excluding the Yukon and Northwest Territories) that were in operation at the time of the survey. A list of farms taken from the 1991 Census of Agriculture was used to determine which farms would be included in the sample frame. Because of certain constraints on data collection, some farms were excluded from the population: farms whose sales of agricultural products were less than \$2,000, farms located on Indian reserves, institutional farms, community pastures, and multi-holding companies.

4.1.2 Stratification

The list of farms was stratified by ecozone (only those with farms in 1991), province and farm type. Each ecozone is an approximate grouping of census enumeration areas sharing common ecological and environmental characteristics. Canada is composed of 15 different ecozones, seven of which have

a significant number of farms (see Figure 1). These ecozones were stratified by province and farm type. Each farm type is a grouping of farms which receive most of their agricultural sales from a given commodity (e.g., beef farms). Since the number of farms in each grouping is different in each province, the set of farm types varies from province to province.

4.1.3 Sample Selection

The sample was selected to minimize overlap with the samples of two farm surveys with the same collection period as the Farm Inputs Management Survey. Simple random sampling was used to obtain the required sample size for each stratum.

4.1.4 Sample Allocation

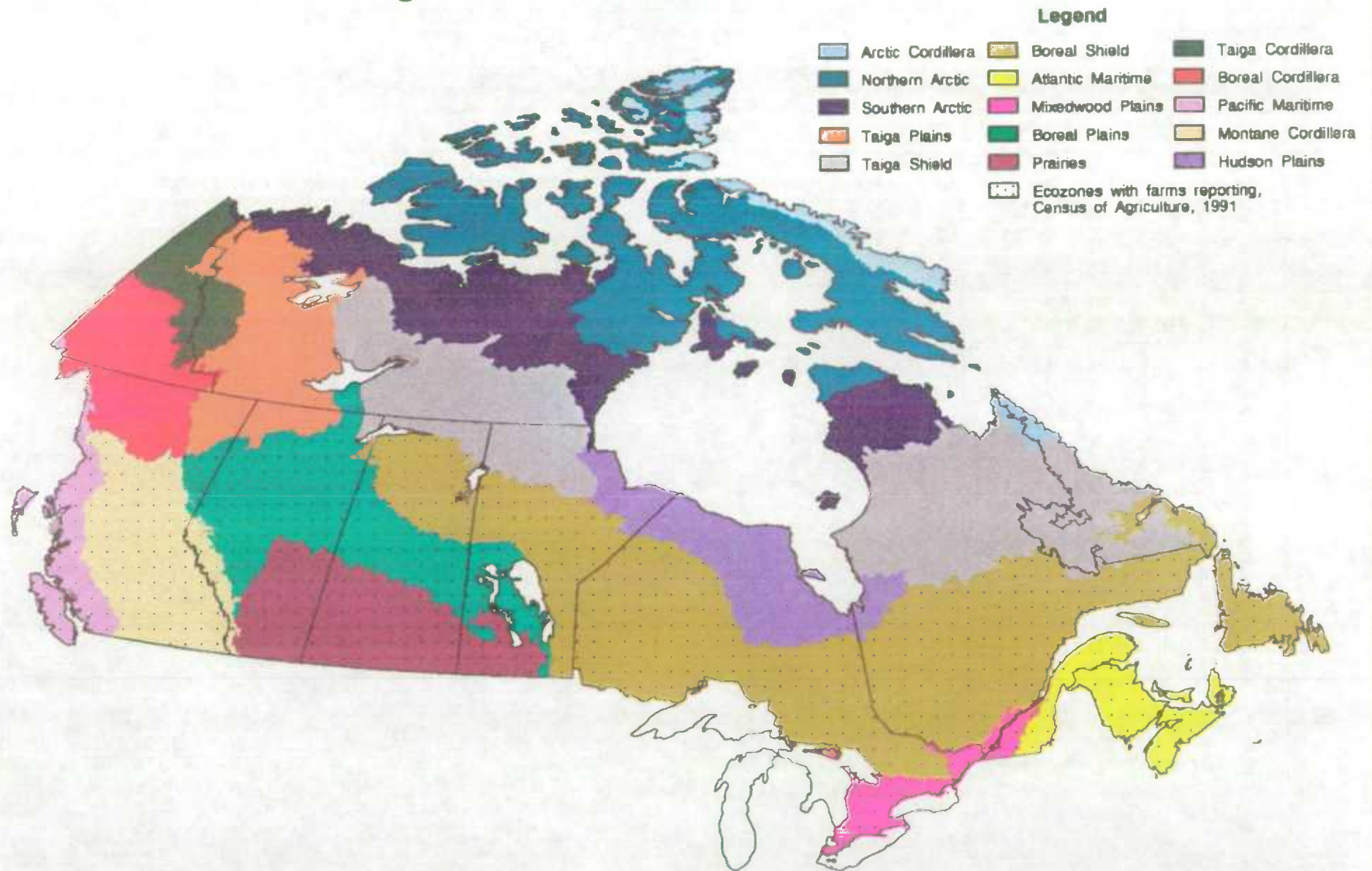
The total sample size was set at 6,000 farms. Allocation proportional to population size was used, with a minimum sample size of 58 farms per stratum. This threshold was designed to ensure representation of farms with unusual characteristics within each stratum. An unusual characteristic is a feature found in at most 5% of a stratum's population.

Tables 1 and 2 show the population and sample size for each province and ecozone with farms.

Table 1: Population and sample size by province

Province	Number of farms in the population	Number of farms in the sample
Newfoundland	504	116
Prince Edward Island	2 115	174
Nova Scotia	3 310	174
New Brunswick	2 680	174
Quebec	34 671	781
Ontario	61 021	1 211
Manitoba	22 636	634
Saskatchewan	56 031	1 146
Alberta	52 286	1 067
British Columbia	14 933	523
Canada	250 187	6 000

Figure 1: Ecozones of Canada



Source: Environment Canada, State of the Environment Directorate, 1993

Produced by: SAGA, Agriculture Division, Statistics Canada

Table 2: Population and sample size for ecozones with farms

Ecozone	Number of farms in the population	Number of farms in the sample
Boreal Shield	10 937	488
Atlantic Maritime	18 258	774
Mixedwood Plains	75 704	1 477
Boreal Plains	39 333	1 030
Prairies	92 055	1 817
Pacific Maritime	6 510	174
Montane Cordillera	7 390	233
Canada	250 187	6 000

Table 3 shows the number of farms in the population for ecozones with farms and province.

Table 3: Population by ecozone/province

Number of farms in the population								
Province	Ecozone							
	Boreal Shield	Atlantic Maritime	Mixed-wood Plains	Boreal Plains	Prairies	Pacific Maritime	Montane Cordillera	Total
Newfoundland	504	0	0	0	0	0	0	504
Prince Edward Island	0	2 115	0	0	0	0	0	2 115
Nova Scotia	0	3 310	0	0	0	0	0	3 310
New Brunswick	0	2 680	0	0	0	0	0	2 680
Quebec	5 774	10 153	18 744	0	0	0	0	34 671
Ontario	4 061	0	56 960	0	0	0	0	61 021
Manitoba	598	0	0	5 695	16 343	0	0	22 636
Saskatchewan	0	0	0	11 035	44 996	0	0	56 031
Alberta	0	0	0	21 302	30 716	0	268	52 286
British Columbia	0	0	0	1 301	0	6 510	7 122	14 933
Canada	10 937	18 258	75 704	39 333	92 055	6 510	7 390	250 187

Table 4 shows the number of farms in the sample for ecozones with farms and province.

Table 4: Sample size by ecozone and province

Number of farms in the sample								
Province	Ecozone							
	Boreal Shield	Atlantic Maritime	Mixed-wood Plains	Boreal Plains	Prairies	Pacific Maritime	Montane Cordillera	Total
Newfoundland	116	0	0	0	0	0	0	116
Prince Edward Island	0	174	0	0	0	0	0	174
Nova Scotia	0	174	0	0	0	0	0	174
New Brunswick	0	174	0	0	0	0	0	174
Quebec	141	254	386	0	0	0	0	781
Ontario	116	0	1 095	0	0	0	0	1 211
Manitoba	116	0	0	174	344	0	0	634
Saskatchewan	0	0	0	264	882	0	0	1 146
Alberta	0	0	0	418	591	0	58	1 067
British Columbia	0	0	0	174	0	174	175	523
Canada	488	774	1 477	1 030	1 817	174	233	6 000

Collection was conducted from three Statistics Canada Regional Offices: Montreal (interviewed approximately 1,400 producers (23%) in Quebec and the Maritime provinces); Sturgeon Falls (interviewed approximately 1,200 producers (20%) in Ontario); and Winnipeg (interviewed approximately 3,400 producers (57%) west of Ontario). The response rate¹ was 93.1%.

¹Response rate refers to the number of survey contacts who were still operating a farm at the time of the survey.

4.2 Treatment of Non-Response

There are two types of non-response: total non-response and partial non-response.

Total non-response applies to survey forms on which all questions have been left blank. In such cases, the farms either could not be contacted or refused to take part in the survey. Total non-response also applies when only a few questions have been answered. The small amount of information that is collected is of little or no value and these forms are considered non-responses.

Partial non-response applies when most of the questions on the form have been answered. In these cases, the respondents were unable or unwilling to supply the information required by certain questions.

4.2.1 Total Non-Response

Where there were farms with survey forms that were considered non-responses, the sampling weight was adjusted upward at the estimation stage to compensate for the loss of these units. The adjustment was made in the sampling weights of farms with partial or complete questionnaires, as explained in section 4.3.1 below.

4.2.2 Partial Non-Response

In the case of partial questionnaires, two methods were used to obtain the missing information.

For variables relating to a farm's physical characteristics and profile (livestock, land area, farm type, operator's age, farm receipts), historical imputation was used based on data from the 1991 Census of Agriculture. In the case of the livestock, land area and farm receipts variables, correction factors were used to adjust the census data to the survey's reference period (1995). These adjustment factors were computed from data provided by annual farm surveys that measured the same variables.

For variables relating to farm inputs management, the missing information was derived through random imputation based on the distribution of respondents in the same stratum. This imputation method involves supplying a random response for non-response items. Though random, the response is selected so that the distribution of responses before and after imputation is essentially the same.

4.3 Estimation

After processing for partial non-response, the data were used to produce estimates.

4.3.1 Calculation of Sampling Weights

The sampling weights were derived by taking the ratio of the number of farms in the population to the observed sample size in each stratum. Farms that supplied no valid data, could not be contacted or refused to participate were excluded from the calculation of observed sample sizes, thereby

increasing the sampling weights of the other farms selected.

4.3.2 Calculation of Estimates

The ratio method was used to estimate the farm inputs management variables. In each ratio the numerator was an estimate of the number of farms with a particular characteristic in a particular domain (ecozone, province, farms storing manure in an ecozone, and so on), and the denominator was an estimate of the total number of farms in this domain. The method of using estimates in the numerator and the denominator is known as simple expansion estimation. The estimates are based on the sampling weights described above.

4.4 Data Confidentiality

All tabulated data are subject to restrictions prior to release. A number of computerized checks are performed on all data cells to prevent publication or disclosure of any information concerning any particular farm operation.

For each of the tabulations produced the estimated number of farms is rounded to the base "5" and the estimates of the other variables within the table are adjusted by a variable factor. Should the degree of detail required to answer user requests create confidentiality concerns, the affected data or the entire table will be automatically suppressed by the database system. In this way, confidentiality of the data is preserved without jeopardizing the quality of the estimates.

5.0 Data Reliability and Limitations

5.1 Data Reliability

The statistics contained in this publication are estimates derived from a sample survey of agricultural operators and, as such, are subject to sampling and non-sampling errors. The quality of the estimates thus depends on the combined effect of these types of errors.

5.2 Sampling Errors

These errors occur because observations are made only on a sample and not on the entire population. The sampling error depends on such factors as the size of the sample, the variability of the characteristic of interest in the population, the sampling design, and the method of estimation. For example, for a given sample size, the sampling error will depend on the stratification procedure employed, allocation of the sample, choice of the sampling units and method of selection.

In sample surveys, since inference is made about the entire population covered by the survey on the basis of data obtained from only part of the population, the results are likely to be somewhat different than if a complete census was taken under the same general survey conditions. The most important feature of probability sampling is that the sampling error can be measured from the sample itself.

5.3 Non-Sampling Errors

Non-sampling errors can occur whether an estimate is based on a sample or on a complete census of the population. These errors may be introduced at various stages of the survey (such as frame definition, collection, capture, non-response, editing, weighting, tabulation, etc.) and include the response errors introduced inadvertently by the farm operators. All efforts are taken to minimize non-sampling errors through extensive edits and data analysis. However, some limitations have been identified. For example, respondents may have been hesitant to answer sensitive questions, and there may have been a bias towards providing the "environmentally correct" answer. While some of these non-sampling errors may be minimized by making changes to the questionnaire, they will never be totally eliminated.

5.4 Data Quality

Each estimate in this publication has a potential error introduced by sampling. This error can be estimated from the sample itself using a statistical measure called the coefficient of variation (CV). The CV, defined as the standard error divided by the survey estimate, is a measure of precision in relative terms and is expressed as a percentage. Over repeated surveys, 95 times out of 100, the relative difference between a sample estimate and what should have been obtained from an enumeration of all farming operations with respect to the sample estimates would be less than twice the CV.

The CV is appropriate for level estimates but for proportions it is preferable to use the standard error (SE), also referred to as an absolute sampling error.

Eg.: We are interested in the proportion p of farms which store liquid manure among the ones which store any kind of manure.

In the Maritimes, this estimated proportion p is 12% with a standard error of 3.35. We can deduce that the proportion of the farms that do **not** store liquid manure is 88% and that the quality of this estimate is the same (i.e., the standard error is still 3.35). The standard error is an absolute error that applies to the 12% as well as to the 88% estimates. In this case, the CV, being a relative error, would be different for the two estimates. It can even appear good for one proportion (88%), and bad for the complementary proportion (12%) as shown here:

$$CV = 100 \cdot \frac{3.35}{12} = 28 \quad \text{for the farms which store liquid manure, and}$$

$$CV = 100 \cdot \frac{3.35}{88} = 4 \quad \text{for the farms which do not store liquid manure.}$$

Though the quality of the two estimates is the same, the CV implies that the quality of the estimated proportion of farms which store liquid manure is much lower. In this case, as with all proportion

estimates, the SE should be used.

The following is a suggested CV rating system for level estimates, and a standard error (SE) rating system for proportion estimates:

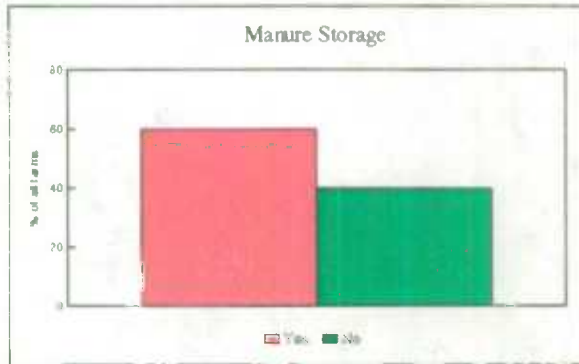
<u>CV</u>	<u>Rating</u>
0.00% - 4.99%	A - very good
5.00% - 9.99%	B - good
10.0% - 14.99%	C - acceptable but use with caution
15.0% - 24.99%	D - use with caution unless independent data source concurs with the estimate
25.0% +	E - unreliable

<u>SE</u>	<u>Rating</u>
0.00 - 2.49	A - very good
2.50 - 4.99	B - good
5.00 - 7.49	C - acceptable but use with caution
7.50 - 12.49	D - use with caution unless independent data source concurs with the estimate
12.5 +	E - unreliable

6.0 Canada-Level Results²

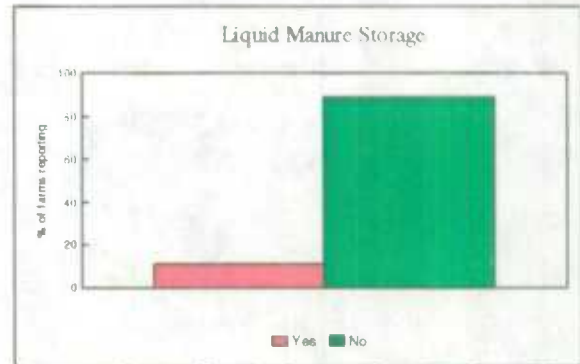
1. Is manure stored on this agricultural operation?

	# of farms	% of farms	SE
Yes	133,660	60	A
No	90,390	40	A
Total	224,050	100	



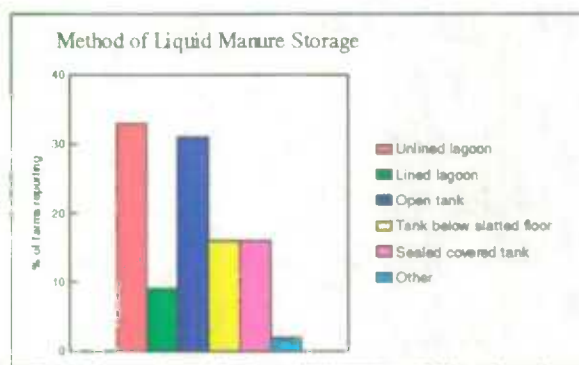
2. Do you store any liquid manure?

	# of farms	% of farms	SE
Yes	14,855	11	A
No	118,800	89	A
Total	133,655	100	



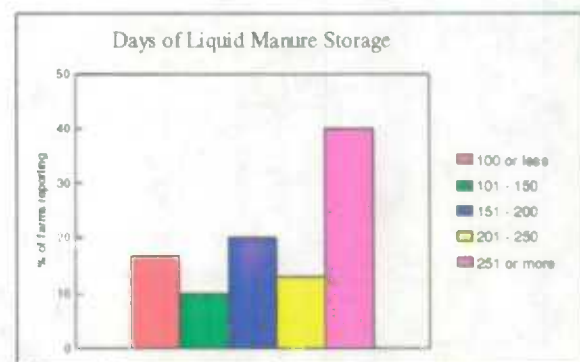
3. How is the liquid manure stored?

	# of farms	% of farms	SE
Unlined lagoon	4,925	33	B
Lined lagoon	1,375	9	A
Open tank	4,565	31	B
Tank below slatted floor	2,410	16	A
Sealed covered tank	2,410	16	A
Other	335	2	A



4. How many days of liquid manure production can you store?

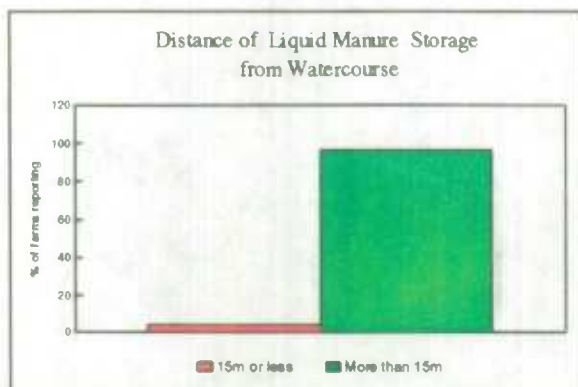
	# of farms	% of farms	SE
100 or less	2,535	17	A
101 - 150	1,440	10	A
151 - 200	2,955	20	A
201 - 250	1,960	13	A
251 or more	5,960	40	B
Total	14,850	100	



²Totals may not add due to rounding.

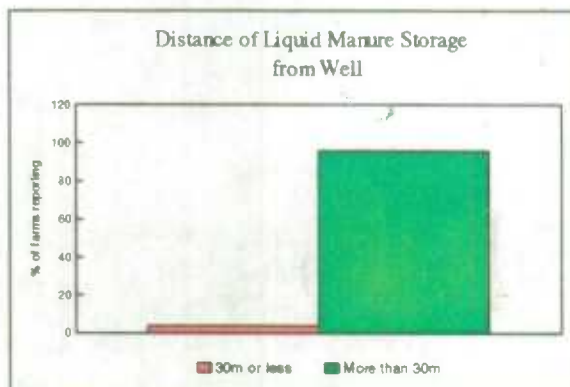
5. How far are the liquid manure storage facilities from the nearest watercourse?

	# of farms	% of farms	SE
15m or less	595	4	A
More than 15m	14,255	96	A
Total	14,850	100	



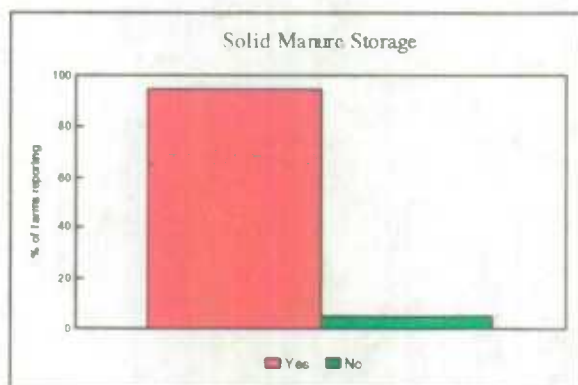
6. How far are the liquid manure storage facilities from any well used for domestic purposes?

	# of farms	% of farms	SE
30m or less	565	4	A
More than 30m	14,290	96	A
Total	14,855	100	



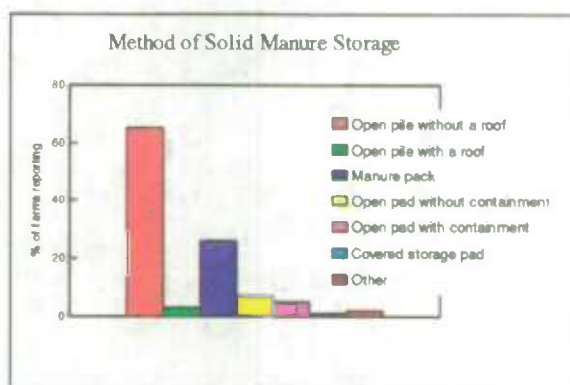
7. Do you store any solid manure?

	# of farms	% of farms	SE
Yes	126,465	95	A
No	7,185	5	A
Total	133,650	100	



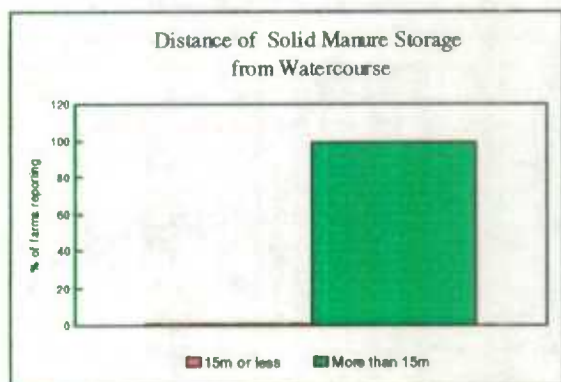
8. How is the solid manure stored?

	# of farms	% of farms	SE
Open pile without a roof	82,245	65	A
Open pile with a roof	4,015	3	A
Manure pack	33,085	26	A
Open pad without containment	8,645	7	A
Open pad with containment	6,430	5	A
Covered storage pad	855	1	A
Other	2,730	2	A



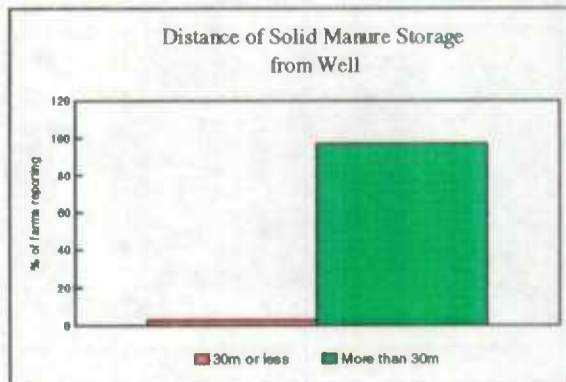
9. How far are the solid manure storage facilities from the nearest watercourse?

	# of farms	% of farms	SE
15m or less	1,735	1	A
More than 15m	124,730	99	A
Total	126,465	100	



10. How far are the solid manure storage facilities from the nearest well?

	# of farms	% of farms	SE
30m or less	3,815	3	A
More than 30m	122,645	97	A
Total	126,460	100	



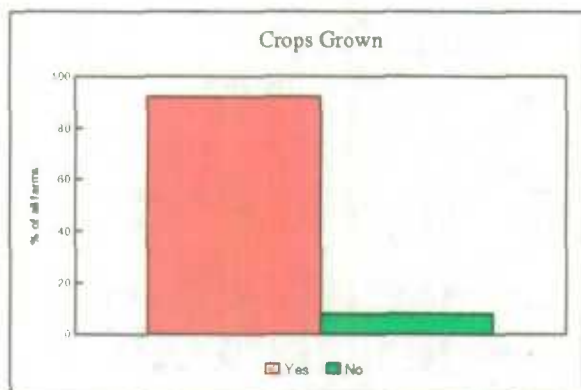
11. Of the total amount of manure applied in 1995, what percentage was applied, last winter, in spring, in summer and in fall?

	# farms reporting Last winter	# farms reporting In spring	# farms reporting In summer	# farms reporting In fall
1 - 25% CV	20,020 A	17,790 B	24,725 A	10,090 B
26 - 50% CV	6,340 B	26,500 A	11,280 B	24,175 A
51 - 75% CV	1,860 D	4,295 C	1,200 D	14,075 B
76 - 100% CV	1,995 D	23,860 A	15,850 B	40,060 A
Total	30,215	72,445	53,055	88,400

Farm Inputs Management Survey, 1995

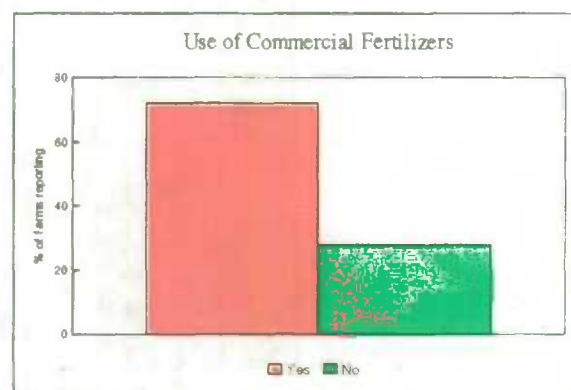
12. In 1995, were any crops grown (include hay)?

	# of farms	% of farms	SE
Yes	205,955	92	A
No	18,090	8	A
Total	224,045	100	



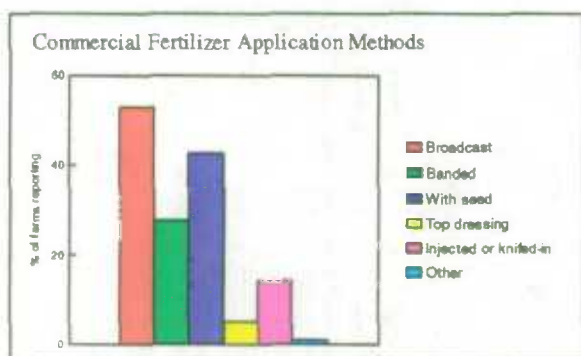
13. In 1995, were any commercial fertilizers applied?

	# of farms	% of farms	SE
Yes	148,055	72	A
No	57,900	28	A
Total	205,955	100	



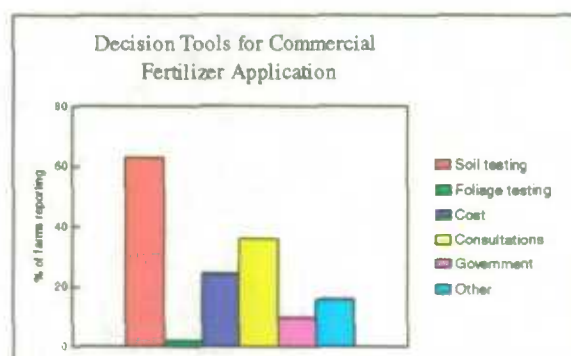
14. In 1995, how was commercial fertilizer applied?

	# of farms	% of farms	SE
Broadcast	78,180	53	A
Banded	41,670	28	A
With seed	63,745	43	A
Top dressing	6,895	5	A
Injected or knifed-in	20,415	14	A
Other	1,590	1	A



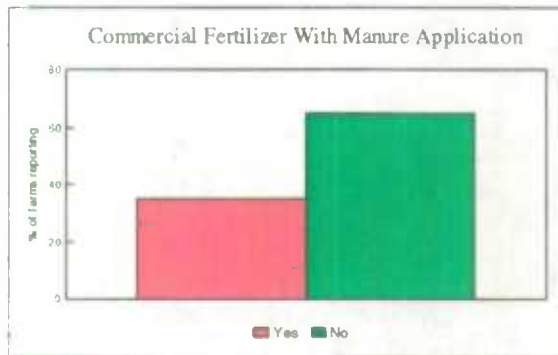
15. How do you usually decide on the amount and type of commercial fertilizer to apply?

	# of farms	% of farms	SE
Soil testing	92,895	63	A
Foliage testing	3,155	2	A
Cost	34,795	24	A
Consultations	53,555	36	A
Government	14,925	10	A
Other	22,960	16	A



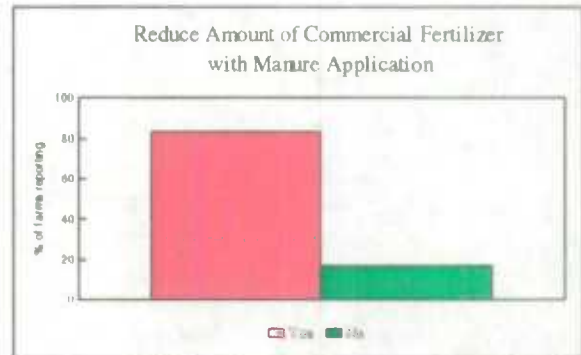
16. Do you apply commercial fertilizers to land that has had manure applied to it?

	# of farms	% of farms	SE
Yes	51,155	35	A
No	96,900	65	A
Total	148,055	100	



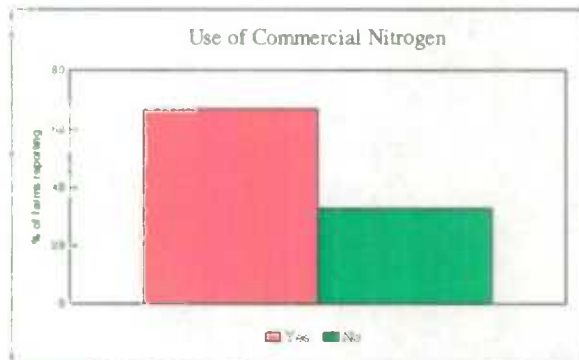
17. Do you reduce the amount of commercial fertilizer to offset the nutrient content of the manure?

	# of farms	% of farms	SE
Yes	42,385	83	A
No	8,765	17	A
Total	51,150	100	



18. In 1995, did you apply commercial nitrogen?

	# of farms	% of farms	SE
Yes	99,110	67	A
No	48,945	33	A
Total	148,055	100	

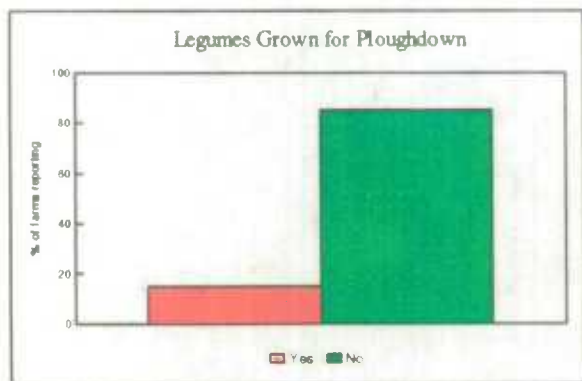


19. Of the total amount of nitrogen applied in 1995, what percentage was applied, before planting, at planting and after planting?

	# farms reporting Before planting	# farms reporting At planting	# farms reporting After planting
1 - 25% CV	2,795 C	10,360 B	2,620 C
26 - 50% CV	7,865 B	8,745 B	5,155 B
51 - 75% CV	5,140 C	1,795 D	1,600 D
76 - 100% CV	45,520 A	21,020 A	15,725 B
Total	61,320	41,920	25,100

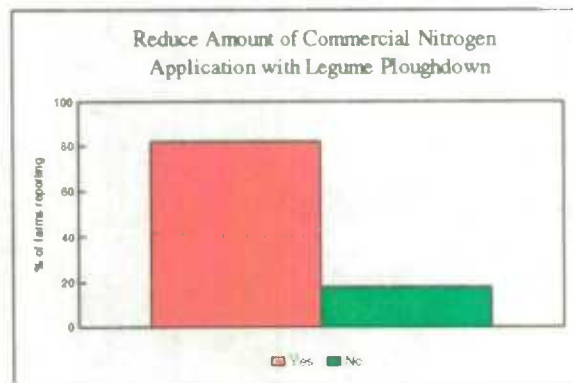
20. Are legumes grown on this farm solely for ploughdown?

	# of farms	% of farms	SE
Yes	14,580	15	A
No	84,535	85	A
Total	99,115	100	



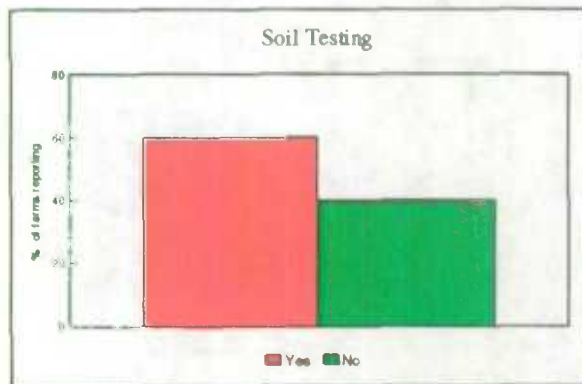
21. Do you reduce the amount of commercial nitrogen to offset the nutrient content of the legume ploughdown?

	# of farms	% of farms	SE
Yes	12,010	82	A
No	2,565	18	A
Total	14,575	100	



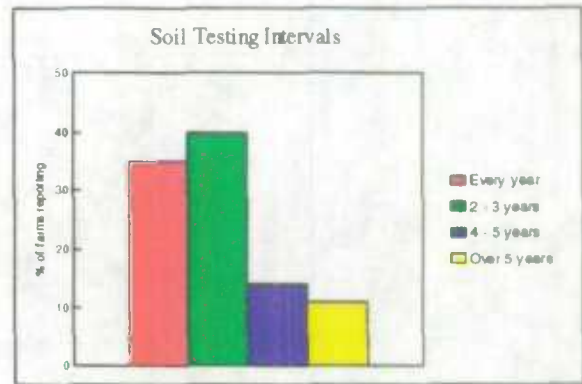
22. Do you conduct soil tests?

	# of farms	% of farms	SE
Yes	124,050	60	A
No	81,910	40	A
Total	205,960	100	



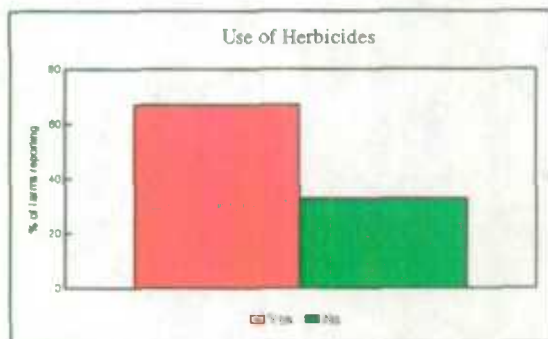
23. How often do you soil test?

	# of farms	% of farms	SE
Every year	43,730	35	A
2 - 3 years	49,270	40	A
4 - 5 years	17,355	14	A
Over 5 years	13,700	11	A
Total	124,055	100	



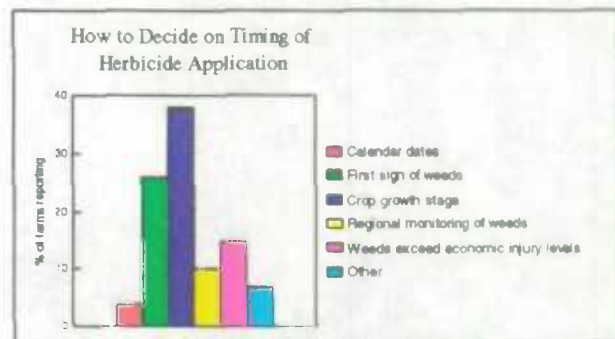
24. In 1995, were herbicides applied to the crops?

	# of farms	% of farms	SE
Yes	138,535	67	A
No	67,420	33	A
Total	205,955	100	



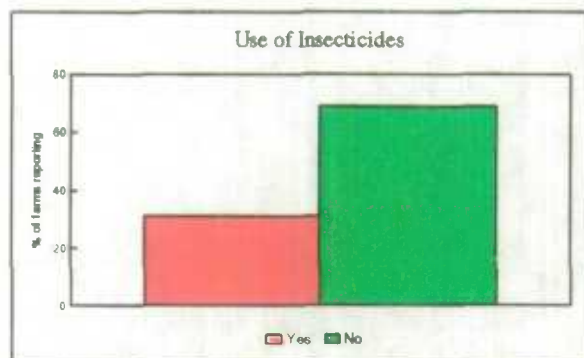
25. Which best describes how you decide when to apply herbicides?

	# of farms	% of farms	SE
Calendar dates	6,175	4	A
First sign of weeds	35,375	26	A
Crop growth stage	52,045	38	A
Regional monitoring of weeds	14,320	10	A
Weeds exceed economic injury levels	21,415	15	A
Other	9,205	7	A
Total	138,535	100	



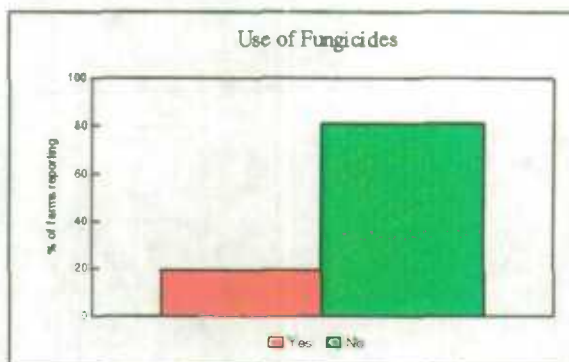
26. In 1995, were any insecticides applied to the crops?

	# of farms	% of farms	SE
Yes	63,265	31	A
No	142,685	69	A
Total	205,950	100	



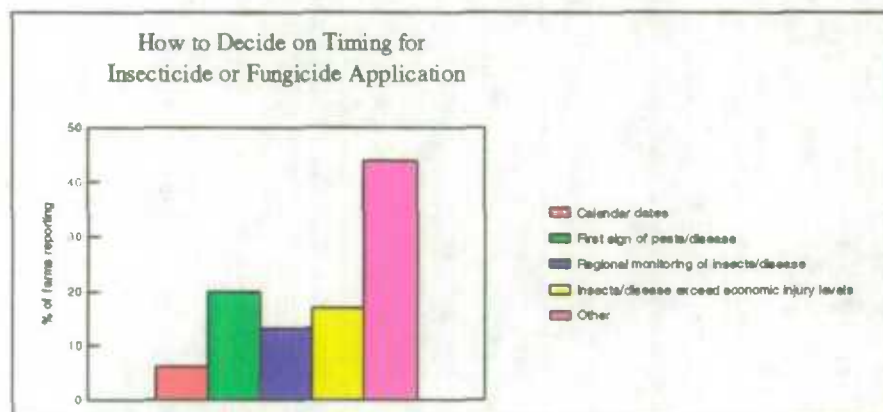
27. In 1995, were any fungicides applied to the crops?

	# of farms	% of farms	SE
Yes	39,515	19	A
No	166,435	81	A
Total	205,950	100	



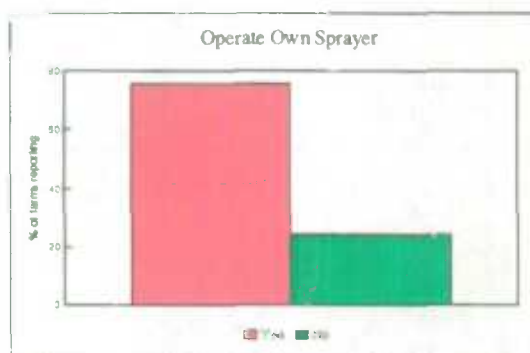
28. Which best describes how you decide when to apply insecticides/fungicides?

	# of farms	% of farms	SE
Calendar dates	4,125	6	A
First sign of pests/disease	14,690	20	A
Regional monitoring of insects/disease	9,150	13	A
Insects/disease exceed economic injury levels	12,480	17	A
Other	32,055	44	A
Total	72,500	100	



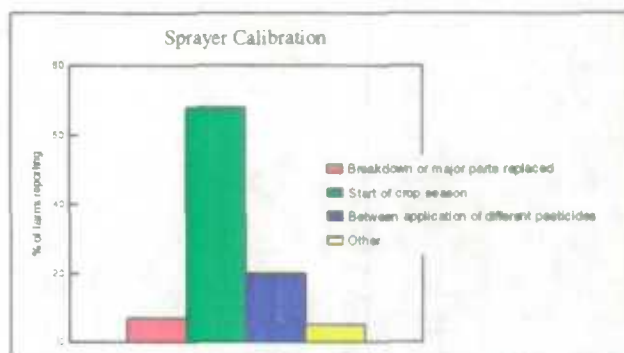
29. Do you operate your own sprayer?

	# of farms	% of farms	SE
Yes	110,875	76	A
No	34,615	24	A
Total	145,490	100	



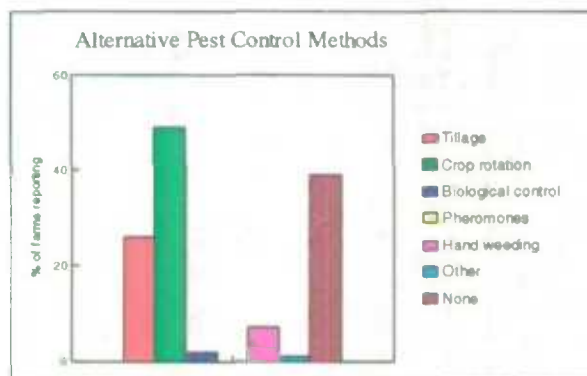
30. When do you calibrate your sprayer?

	# of farms	% of farms	SE
Breakdown or major parts replaced	7,295	7	A
Start of crop season	75,515	68	A
Between application of different pesticides	22,020	20	A
Other	6,035	5	A
Total	110,865	100	



31. Do you use any pest control methods other than commercial pesticides?

	# of farms	% of farms	SE
Tillage	53,805	26	A
Crop rotation	99,970	49	A
Biological control	4,570	2	A
Pheromones	495	0	A
Hand weeding	14,900	7	A
Other	2,605	1	A
None	80,510	39	A



32. Summary of land

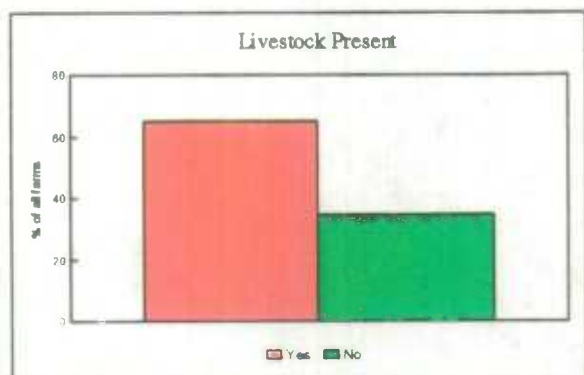
	Land area (acres)	Avg. per farm (acres)	CV*
Field crops	94,502,142	466	A
Summerfallow	18,878,486	271	A
Pasture	40,807,967	297	C
Other	13,661,605	84	A

*NOTE: CV relates to the estimated number of acres

Farm Inputs Management Survey, 1995

34. On December 1, 1995 were there any livestock on this farm?

	# of farms	% of farms	SE
Yes	145,070	65	A
No	78,980	35	A
Total	224,050	100	



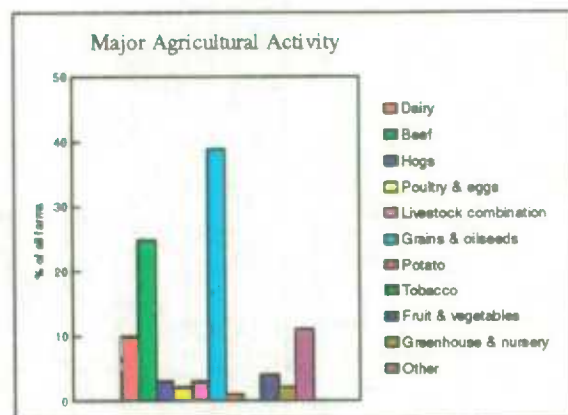
36. Which agricultural activity generates 51% or more of your gross farm receipts?

	# of farms	% of farms	SE
Dairy	23,435	10	A
Beef	57,035	25	A
Hogs	6,590	3	A
Poultry & eggs	3,740	2	A
Livestock combination	7,120	3	A
Grains & oilseeds	88,475	39	A
Potato	1,085	1	A
Tobacco	935	0	A
Fruit & vegetables	7,975	4	A
Greenhouse & nursery	3,630	2	A
Other	24,040	11	A
Total	224,060	100	

35. Livestock inventory

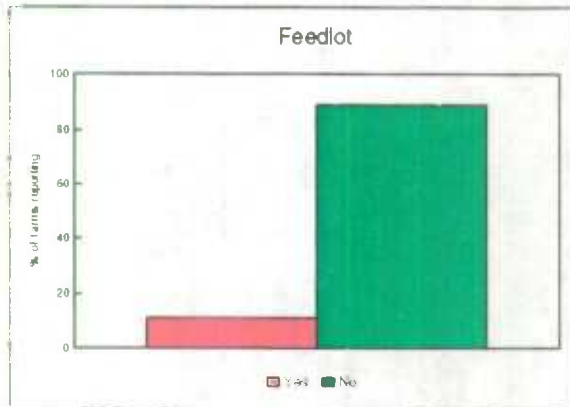
	Avg. per farm (animals)	CV*
Bulls, 1 year and over	3	B
Cows, mainly for dairy	42	B
Cows, mainly for beef	54	A
Heifers, 1 year and over	21	C
Steers, 1 year and over	26	D
Calves, under 1 year	49	C
Hogs	527	C
Sheep and lambs	73	C
Hens and chickens	3,171	C
Other livestock	94	E

*NOTE: CV relates to the estimated average number of animals per farm



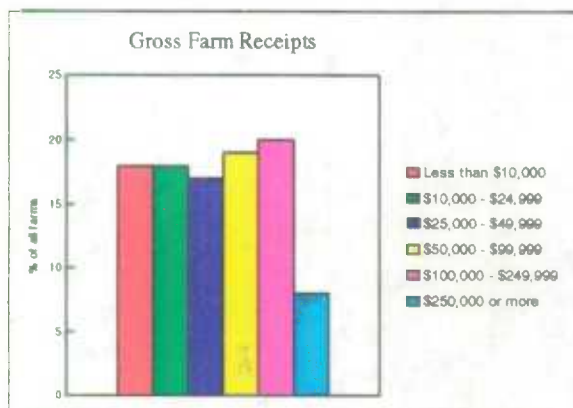
37. Is this a feedlot operation?

	# of farms	% of farms	SE
Yes	6,105	11	A
No	50,925	89	A
Total	57,030	100	



39. What were the gross farm receipts (before expenses) of this farm for 1994, or the most recent fiscal year?

	# of farms	% of farms	SE
Less than \$10,000	40,625	18	A
\$10,000 - \$24,999	41,315	18	A
\$25,000 - \$49,999	38,335	17	A
\$50,000 - \$99,999	41,985	19	A
\$100,000 - \$249,999	43,930	20	A
\$250,000 or more	17,855	8	A
Total	224,045	100	



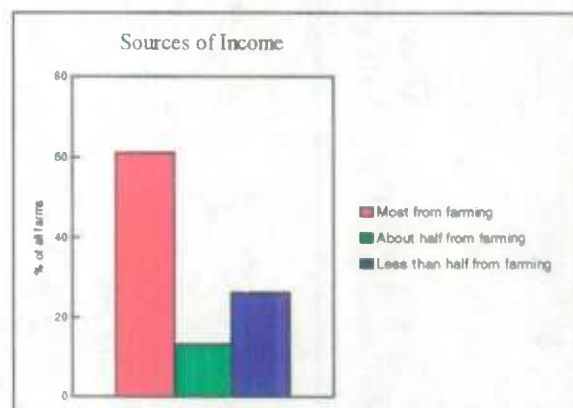
38. How many market hogs have you sold during the past 12 months?

	Avg. per farm (animals)	CV*
# of market hogs sold	1,674	B

*NOTE: CV relates to the estimated average number of animals per farm

40. Do you earn:

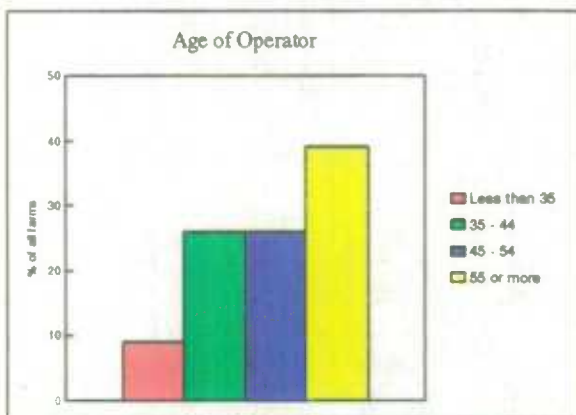
	# of farms	% of farms	SE
Most from farming	135,580	61	A
About half from farming	29,155	13	A
Less than half from farming	59,320	26	A
Total	224,055	100	



Farm Inputs Management Survey, 1995

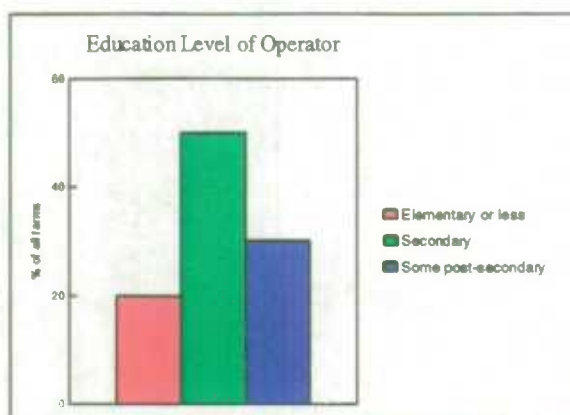
41. Are you:

	# of farms	% of farms	SE
Less than 35	20,185	9	A
35 - 44	58,930	26	A
45 - 54	58,395	26	A
55 or more	86,540	39	A
Total	224,050	100	



42. Which describes the highest level of education that you have completed?

	# of farms	% of farms	SE
Elementary or less	43,915	20	A
Secondary	111,890	50	A
Some post-secondary	68,240	30	A
Total	224,045	100	



7.0 Notes to Data Users

Users of data from the Farm Inputs Management Survey should be aware of the following limitations:

General:

- While the target population of the Farm Inputs Management Survey consists of all farms in Canada (excluding the Yukon and Northwest Territories) that were in operation at the time of the survey, some farms were excluded from the population: farms whose sales of agricultural products were less than \$2,000, farms located on Indian reserves, institutional farms, community pastures, and multi-holding companies. Consequently, the total number of farms indicated by the survey results underestimates the total number of actual farm operations in Canada.
- The estimates are slightly altered by the confidentiality method used. Each estimated number of farms is randomly rounded and then the estimates of the other variables are adjusted by a variable factor.

Specific:

Section I - Manure Management:

In this survey, how manure waste is managed when animals are confined to an area has been targeted. This is in contrast to large pasture areas where animals are not confined, which is considered less of an environmental issue. Issues pertaining to animals which are pastured with direct access to streams or other water bodies have not been addressed in this survey.

Questions 3, 8: Liquid and Solid (or Semi-Solid) Manure Storage Methods

The adoption of manure storage methods that minimize runoff, thereby preventing surface and groundwater contamination is encouraged in many provinces through government programs.

Question 4: Liquid Manure Storage Capacity

The storage of livestock manure is regarded as an important part of nutrient management and in reducing the potential environmental impacts associated with manure. Adequate sizing is a critical feature of manure storage design to contain nutrients and prevent runoff. Manure storage must be large enough to handle the volume of wastes generated until weather, soil and crop conditions allow spreading.

Questions 5, 6, 9, 10: Distance of Liquid and Solid (or Semi-Solid) Manure Storage from a Stream or Well

Although the sampling error (as indicated by the standard error of the estimate) shows the quality of this estimate to be rated "very good", the non-sampling error may be significant, particularly with respect to respondent bias. This may have resulted in an underestimation of those farm operations

with liquid and solid (or semi-solid) manure storage facilities located 15 metres or less from the nearest watercourse, or 30 metres or less from any well used for domestic purposes. Also, strict local environmental regulations may place restrictions on distances to water sources for new operations that older operations do not meet.

Question 11: Timing of Manure Application

The issue here is winter application of manure on frozen ground where few, if any, nutrients are absorbed by soil or crops and the risk of runoff into local surface waterways is greatest. Spring and fall can present similar situations, so it will be important to consider the conditions of the particular spring or fall in various regions when the data were collected when interpreting the data. Ideally, manure should be applied when the soil is dry enough and crop conditions are suitable for manure use. It is difficult to rank which season is actually best.

Section II - Commercial Fertilizer Management:

Questions 15, 22: How to Decide the Amount and Type of Fertilizer to Apply

Informed decision-making by producers is at the heart of adopting best management practices. While it is difficult to attach a best management practice to any of the options, the producer who indicates that he/she uses several strategies to decide the amount and type of inputs to apply shows a keen interest in controlling fertilizer input costs and reducing adverse soil and water quality risks.

Questions 16, 17: Reduction of Nutrients by Amount of Manure Application

It is important to include the contributions from manure when deciding how much commercial fertilizer is required. Failure to do so may lead to excessive fertilization and thus increase the risks associated with leaching and runoff.

Question 19: Timing of Fertilizer Application

For economic as well as environmental reasons, nutrients should be applied in amounts and at the stage of the growing season which corresponds to the nutrient requirements of the crop. For mobile nutrients such as nitrogen, application prior to crop establishment may increase the nutrient concentration in soils and the risk of leaching. Application following establishment will provide nutrients for uptake by plants and plant growth, thus reducing risks associated with leaching and runoff.

Questions 20, 21: Reduction of Nitrogen by Amount of Legume Ploughdown

Leguminous crops such as alfalfa and clover in a rotation add nitrogen to the soil. It is important to include the nutrient contributions from such crops when deciding how much commercial fertilizer is required. Failure to do so may lead to excessive fertilization and thus increase the risks associated with leaching and runoff.

There is the potential for poor data quality at lower geographic levels because of the local nature of this practice. It is commonly used in potato-grain-legume rotations.

Question 23: Frequency of Soil Testing

Generally, soil test values indicate the amount of nutrients to apply for maximum yield. Testing at 2-3 year intervals is considered a best management practice.

Section III - Pesticide Application Practices:

Question 28: Timing of Pesticide Applications

The adoption of Integrated Pest Management (IPM) techniques is key here. The idea is to apply pesticide when the benefit from controlling the pest exceeds the cost of the pesticide. The best management practice is to spray according to pest lifecycles and thresholds on site. Each field should be monitored separately because conditions vary. Identifying problems early may translate to a reduced need for pesticides. Sometimes the problem is very localized and only spot treatment is required. Regional weather monitoring programs can be used to time fungicide spraying, and provincial government programs and information lines provide pest updates. Spraying at the first sign of pests is often not recommended since the presence of pests does not always cause economic damage. It is tempting to do so, however, because immature pests are easier to control than adult insects or larger, mature weeds. Spraying based solely on calendar dates is discouraged.

Question 29: Operation of Own Sprayer vs Custom Application

This question demonstrates the degree to which custom application is used. Custom application of pesticides (i.e., by someone else other than the farm operator, including companies that specialize in pesticide application) is often, but not always, done by a trained or certified person. Other sources indicate a trend towards increasing use by producers of custom application services when dealing with pesticides (including herbicides, insecticides and fungicides). This is due to high costs associated with new and more sophisticated equipment, time constraints and more regulatory requirements. Only those respondents who operate their own sprayer were asked the question on sprayer calibration.

Question 30: Sprayer Calibration

Careful sprayer calibration ensures the proper rate of application. Using more pesticide than is needed is expensive, wasteful and unnecessarily increases the load on the soil. Some pesticides persist in the soil and may harm future crops or the environment. The best practice is to calibrate the sprayer between applications of different types of pesticides.

Question 31: Other Pest Control Methods

Any method or combination of methods that reduces the use of commercial pesticides decreases the potential for chemical contamination of the environment.

8.0 How to Access the Results

8.1 Who to Contact

For *general information* regarding the Farm Inputs Management Survey please contact:

Economic and Industry Analysis Division
Agriculture and Agri-Food Canada
930 Carling Avenue
Room 670, Sir John Carling Building
Ottawa, Ontario
K1A 0C5

or call (613) 759-7390.

or fax (613) 759-7236.

For *custom data requests* from the Farm Inputs Management Survey please contact:

Agriculture Division
Statistics Canada
Jean Talon Building, 12th floor
Ottawa, Ontario
K1A 0T6

or call (613) 951-5027.

or fax (613) 951-3868.

Users should be prepared to specify the variables required (e.g., those who apply liquid manure) and the appropriate geographic area (i.e., province, ecozone or province/ecozone combination).

Customized tables are available in hard copy or electronic formats (ASCII, Lotus, etc.). It is important to note that the degree of detail for certain requests may limit data availability due to confidentiality concerns, and as a result some data may be suppressed. The cost of customized products varies according to the size and complexity of the request.

To order other products and services from the Agriculture Division, please refer to the order form provided at the end of this publication.

8.2 Related Products and Services

Statistics Canada, Census of Agriculture, 1991, 1996 (available May 1997)

8.3 For Further Reading

Hillary, N., D. Culver and M. Spearin. 1995. *Farm Inputs Management Survey: Discussion Paper*. Discussion paper prepared by Statistics Canada and Agriculture and Agri-Food Canada on a survey of inputs management practices, including a draft questionnaire.

Appendix A
- Final Questionnaire -

FARM INPUTS MANAGEMENT SURVEY, 1995
- FINAL QUESTIONNAIRE -

Hello, this is _____ calling from Statistics Canada. We are talking to agricultural producers across Canada as part of a study on management of farm inputs such as manure, commercial fertilizers and pesticides. This information on land management practices on Canadian farms is being collected jointly by Statistics Canada and Agriculture and Agri-Food Canada. This data will assist us in gaining a better understanding of management practices and producers' decision-making processes. Your responses are strictly confidential and will be used only for statistical purposes.

SECTION I - Manure Management:

To begin, I would like to ask you some questions about manure management on this agricultural operation.

1. Is manure stored on this agricultural operation?
 - **Include:** *storage in lagoons, tanks, piles, feedlot holding areas, corrals, and pens*
 - **Exclude:** *manure packs in pasture areas, community pastures, grazing associations, crown land*
 - ☐ Yes
 - ☐ No (**GOTO Section II**)
2. Do you store any liquid manure?
 - ☐ Yes
 - ☐ No (**GOTO Q7**)
3. How is the liquid manure stored?
(*check all that apply*)
 - ☐ Unlined lagoon
 - ☐ Lined lagoon
 - ☐ Open tank
 - ☐ Tank below slatted floor
 - ☐ Sealed covered tank
 - ☐ Other method (please specify) _____ (**CATI: GOTO Q3 comments**)
4. How many days of liquid manure production can you store?
 - ☐ 100 days or fewer (3 months or less)
 - ☐ 101 to 150 days (4-5 months)
 - ☐ 151 to 200 days (6-7 months)
 - ☐ 201 to 250 days (8-9 months)
 - ☐ more than 250 days (more than 9 months)

5. How far away are the liquid manure storage facilities from the nearest watercourse, such as a river, stream, pond or lake?
(do not read list; slot answer accordingly)
☐ 15 metres or less (50 feet or less; 16 yards or less)
☐ more than 15 metres (more than 50 feet; more than 16 yards)
6. How far away are the liquid manure storage facilities from any well used for domestic purposes?
• **Include: surface wells or drilled wells**
(do not read list; slot answer accordingly)
☐ 30 metres or less (100 feet or less; 32 yards or less)
☐ more than 30 metres (more than 100 feet; more than 32 yards)
7. Do you store any solid or semi-solid manure on this agricultural operation?
☐ Yes
☐ No (**GOTO Q11**)
8. How is the solid (or semi-solid) manure stored?
(read appropriate type(s) according to response in Q7)
(check all that apply)
☐ As an open pile on the ground without a roof
☐ As an open pile on the ground with a roof over it
☐ As manure pack in barns, pens or corrals
☐ On an open pad without run-off containment
☐ On an open pad with run-off containment
☐ On a covered storage pad
☐ Other method (please specify) _____
9. How far away is the solid (or semi-solid) manure stored from the nearest watercourse, such as a river, stream, pond or lake?
(do not read list; slot answer accordingly)
☐ 15 metres or less (50 feet or less; 16 yards or less)
☐ more than 15 metres (more than 50 feet; more than 16 yards)
10. How far away is the solid (or semi-solid) manure stored from any well used for domestic purposes?
• **Include: surface wells or drilled wells**
(do not read list; slot answer accordingly)
☐ 30 metres or less (100 feet or less; 32 yards or less)
☐ more than 30 metres (more than 100 feet; more than 32 yards)

11. Of the total amount of manure applied in 1995, what percentage was applied:

- (a) last winter _____
- (b) in spring (before planting) _____
- (c) in summer (after planting, after first forage cut, or on summerfallow) _____
- (d) in fall (after harvest) _____
- (e) do not apply manure (sell it, etc.) _____

SECTION II - Commercial Fertilizer Management:

The next few questions deal with commercial (chemical) fertilizers, excluding manure.

12. In 1995, were any crops grown on this agricultural operation?

• **Include:** *field crops, forage crops, hay, sod, greenhouse and nursery products, fruits and vegetables*

- ☐ Yes
- ☐ No (*check, again, ask respondent if he/she grows "hay"; GOTO Section IV*)

13. In 1995, were any commercial (chemical) fertilizers applied?

- ☐ Yes
- ☐ No (**GOTO Q22**)

14. In 1995, how was commercial (chemical) fertilizer applied?

(check all that apply)

- ☐ broadcasting
- ☐ banded
- ☐ with seed
- ☐ top dressing
- ☐ injected or knifed-in
- ☐ other method (please specify) _____

15. How do you usually decide on the amount and type of commercial (chemical) fertilizer to apply?

(check all that apply)

- ☐ soil testing
- ☐ foliage testing (nutrient analysis)
- ☐ cost
- ☐ consultations (neighbours, product representatives or agents)
- ☐ government recommendations (extension officer visits, seminars, reference materials)
- ☐ other (please specify) _____

16. In general, do you apply commercial (chemical) fertilizers to land that has had manure applied to it?
- ☐ Yes
- ☐ No (**GOTO Q18**)
17. Do you reduce the amount of commercial (chemical) fertilizer to offset the nutrient content of the manure?
- ☐ Yes
- ☐ No
18. In 1995, did you apply any commercial nitrogen to your crops?
- ☐ Yes
- ☐ No (**GOTO Q22**)
19. Of the total amount of commercial nitrogen applied in 1995, what percentage was applied:
- (a) before planting _____
- (b) at the time of planting _____
- (c) after planting _____
20. Are any legume crops grown on this agricultural operation solely for ploughdown (e.g., alfalfa, red clover)?
- ☐ Yes
- ☐ No (**GOTO Q22**)
21. Do you reduce the amount of commercial nitrogen applied by the nutrient content of the legume ploughdown?
- ☐ Yes
- ☐ No
22. Do you conduct soil tests? (If checked in Q15, have CATI go directly to Q23)
- ☐ Yes
- ☐ No (**GOTO Section III**)
23. In general, how often do you soil test on this operation?
- (check one only)*
- ☐ every year
- ☐ at 2-3 year intervals
- ☐ at 4-5 year intervals
- ☐ over 5 year intervals

SECTION III - Pesticide Application Practices

Now, I would like to ask you some questions on pesticide application practices used on this agricultural operation. "Pests" include insects, diseases and weeds.

24. In 1995, were any herbicides applied to the crops?

- ☐ Yes
☐ No (GOTO Q26)

25. Which of the following **best** describes how you decide when to apply herbicides? Would you say application is:

- ☐ based on calendar dates
☐ done at the first sign of weeds
☐ based on crop growth stage
☐ determined by regional monitoring for weeds
☐ done when weed levels on your farm have been determined to exceed economic injury levels
☐ other (please specify) _____

26. In 1995, were any insecticides applied to the crops?

• **Include:** *treated seeds*

- ☐ Yes
☐ No

27. In 1995, were any fungicides applied to the crops?

• **Include:** *treated seeds*

- ☐ Yes
☐ No

28. Which of the following **best** describes how you decide when to apply insecticides or fungicides? Would you say application is: (CATI: question asked only if "yes" to Q26 or Q27)

- ☐ based on calendar dates
☐ done at the first sign of pests or disease
☐ determined by regional monitoring of pests or disease
☐ done when pest populations or disease on your farm have been determined to exceed economic injury levels
☐ other (please specify) _____

29. Do you operate your own sprayer?

- ☐ Yes
☐ No (GOTO Q31)

30. When do you calibrate your sprayer? (CATI: question asked only if "yes" to Q29)

(do not rotate or randomize)

- ☐ only when it breaks down or when major components are replaced
- ☐ before the beginning of each crop season
- ☐ between applications of different types of pesticides
- ☐ other (please specify) _____

31. Do you use any pest control methods other than commercial pesticides, such as:

(check all that apply)

- ☐ Tillage
- ☐ Crop Rotation
- ☐ Biological control
- ☐ Pheromones
- ☐ Weeding by hand
- ☐ Other (please specify) _____
- ☐ No other pest control methods used

SECTION IV - Farm Profile Information

Now I would like to ask you some questions about the total area of land on this agricultural operation.

- **Include:** *land rented or leased from others*
- **Exclude:** *land rented or leased to others*

32. In 1995, what was the area of land that was:

- (a) planted to field crops _____
 - **Report seeded area**
 - **Include:** *field crops, forage crops, hay, nursery products, sod, fruits and vegetables*
- (b) summerfallow (CATI: definition screen here) _____
- (c) pasture _____
 - **Include:** *tame pasture, native pasture, grazeable bush*
- (d) all other land _____
 - **Include:** *land on which farm buildings, barnyards, lanes, greenhouses and mushroom houses are located; idle land; woodlots; bogs, marshes, sloughs, etc.*

33. How would you prefer to report the area of land for this operation? (CATI: question asked only if not known from Q32)

- ☐ in acres?
- ☐ in hectares?
- ☐ in arpents (*Québec only*)

34. On December 1, 1995, were there any livestock on this agricultural operation?

• **Include:** *beef cattle, dairy cattle, hogs, poultry, sheep and lambs, other livestock*

- ☐ Yes (CATI: edit required if respondent has livestock, but does not store manure)
☐ No (GOTO Q36)

35. On December 1, 1995, how many of the following did you have on this agricultural operation?

- a) Bulls, 1 year and over: _____
 b) Cows mainly for dairy: _____
 c) Cows mainly for beef: _____
 d) Heifers, 1 year and over: _____
 e) Steers, 1 year and over: _____
 f) Calves, under 1 year: _____
 g) Hogs: _____

• **Include:** *boars, sows for breeding, bred gilts, all other pigs* (CATI: edit; liquid manure required)

- h) Sheep and lambs: _____
 i) Hens and chickens: _____

• **Include:** *turkeys, broilers, roasters, cornish hens, laying hens, pullets, chicks intended for laying, capons*

- j) Other livestock (please specify): _____

36. Which agricultural activity do you derive 51% or more of your gross farm receipts from?
 (use list to prompt only; check only one)

- ☐ Dairy
☐ Beef
☐ Hogs
☐ Poultry and eggs
☐ Livestock combination
☐ Grains and oilseeds
☐ Potato
☐ Tobacco
☐ Fruits and vegetables
☐ Greenhouse and nursery
☐ Other farm types (please specify) _____

37. Is this a feedlot operation? (CATI: question asked only if "Beef" checked in Q36)

- ☐ Yes
☐ No

38. How many market hogs have you sold during the past 12 months? _____
 (CATI: question asked only if "Hogs" checked in Q36)

39. What were the total gross farm receipts (before deducting expenses) of this agricultural operation in 1994, or the most recent fiscal year?

(read only if prompt required)

• **Include:** receipts from all agricultural products sold, Marketing Board payments received, program and rebate payments received, dividends received from co-operatives, custom work and all other farm receipts

• **Exclude:** receipts from the sale of capital items (e.g., land, buildings or machinery), receipts from the sale of any goods bought only for retail sale

- ☐ less than \$10,000
- ☐ \$10,000 to less than \$25,000
- ☐ \$25,000 to less than \$50,000
- ☐ \$50,000 to less than \$100,000
- ☐ \$100,000 to less than \$250,000
- ☐ \$250,000 or more

SECTION V - Demographics

In the final section, I would like to ask you questions about yourself.

40. Do you earn:

- ☐ most of your income from farming
- ☐ about half of your income from farming
- ☐ less than half of your income from farming

41. Are you:

- ☐ under 35 years of age
- ☐ 35 to 44
- ☐ 45 to 54, or
- ☐ 55 years or older

42. Which of the following best describes the highest level of education that you have completed?

- ☐ elementary school or less
- ☐ secondary school
- ☐ post-secondary

SECTION VI - Agreement to Share Information

To avoid duplication and response burden, Statistics Canada has entered into an agreement with Agriculture and Agri-Food Canada for the joint collection and sharing of this information. (Note: Names and addresses are not shared with Agriculture and Agri-Food Canada. The information will be kept confidential and will be used only for statistical purposes).

43. Do you agree to share this information with Agriculture and Agri-Food Canada?

- ☐ Yes
☐ No

That's the end of my questions. Thank you very much for your time

Appendix B:
- Glossary of Selected Terms -

Appendix B: Glossary of Selected Terms

Acre. Measure of land equal to 43,560 square feet, 4,047 square metres or 160 square rods (roughly .4 hectares).

Arpent. Measure of land often used in Quebec. One arpent is equal to 0.845 acres (roughly 1/3 hectare).

Banding. Method of fertilizer application whereby fertilizer is placed below the soil surface in narrow bands prior to, or at the time of seeding.

Best Management Practice. A practical, affordable approach to conserving or enhancing a farm's soil and water without sacrificing productivity.

Biological Control. The use of natural predators to control a pest. Examples include using muscovy ducks to control flies in dairy barns, geese to control weeds in strawberry patches, and ladybugs to control aphids.

Broadcasting. Method of fertilizer application whereby fertilizer is applied over the entire surface area of the field, usually with a truck or tractor-drawn spreader. Fertilizer can also be broadcasted from the air by plane.

Crop Rotation. Planting different crops in the same field over a period of years. Crop rotation helps reduce soil erosion and eliminate pest and disease problems.

Economic Injury Level. The level of pest population that, if left untreated, would result in losses in revenue that exceed treatment costs. The use of economic thresholds in making pesticide treatment decisions requires information on pest infestation levels from *scouting*.

Ecozone. The highest level (i.e., most generalized) of the ecological land classification hierarchy which identifies areas with common landform, water, soil, vegetation, climate, wildlife and human factors. Ecozones are large natural units delineated by distinctive sets of non-living (abiotic) and living (biotic) resources that are ecologically related. Since ecozones represent common biophysical characteristics, they are valuable for monitoring the impact of natural and man-made stress on the environment. Canada is divided up into 15 ecozones. Only 7 ecozones have farms located in them.

Enumeration Area. The geographic area canvassed by one census representative.

Farm Type. A classification of farms based on the percentage of sales of a major commodity or commodity group. For example, farms on which 51% or more of the sales of agricultural products are derived from the sales of dairy products are considered dairy farms. For purposes of statistical tabulations, ten major farm types have been selected: dairy, cattle, hog, poultry and eggs, livestock combination, grain and oilseed, potato, tobacco, fruit and vegetable, and greenhouse and nursery. All farm types not specified above are included in the category "other farm types".

Feedlot. An intensive livestock operation where livestock are fattened for market. The feedlot operation may own the animals, feed them for other farm operator(s) for a fee, or both.

Fertilizers. Inputs (including manure) added to the soil to maximize plant growth. Commercial fertilizers are made up of three primary nutrients: nitrogen (N), phosphorus (P), and potassium (K). Fertilizers come in three forms: *granular fertilizers* can be broadcasted or banded; *liquid fertilizers* can be broadcasted or banded; *gaseous fertilizers* (anhydrous ammonia) are applied by injecting or knifing into the soil. In this survey, commercial (chemical) fertilizers are treated separately from manure.

Fungicides. Chemical inputs applied to cropland for the purpose of controlling disease-causing fungi, moulds, rusts, mildews, etc. Fungicides are usually applied with seed, but may also be applied at post-emergent stages of crop growth.

Hectare. Metric measurement of land. One hectare of land measures 100 metres on each side (roughly 2.5 acres).

Herbicides. Chemical inputs applied to cropland for the purpose of weed control.

Insecticides. Chemical inputs applied to cropland for the purpose of controlling unwanted insect populations.

Integrated Pest Management (IPM). The optimization of pest control in an economically and ecologically sound manner. This pest control strategy is based on the determination of an *economic injury level* or threshold that indicates when a pest population is approaching a level at which control measures are necessary to prevent a decline in net returns. However, control measures must not be implemented at the expense of environmental considerations in order to be considered IPM.

Knifing-In. Associated with banded method of fertilizer application. Liquid or gas fertilizer is often injected directly or knifed into the soil to minimize loss to the atmosphere.

Legume Crops. Crops such as red clover and alfalfa usually used as forages. Legumes can also be used as ploughdown to improve soil quality. These crops add nitrogen to the soil when grown as part of a crop rotation. It is important to include the nutrient contributions from such crops when deciding how much commercial fertilizer is required.

Market Hogs. Hogs that are approximately 220-240 lbs (100-110 kg) and are ready to be sold for slaughter.

Pests. Include weeds, insects and diseases. Agricultural pests cause damage to crops, resulting in reductions in yield, crop quality or both. This study is not concerned with pests such as rodents (e.g., rats, groundhogs) or ungulates (e.g., deer).

Pesticides. Include *herbicides*, *insecticides* and *fungicides*.

Pheromones. Hormonal substance secreted and released by animals (including insects) for detection and response (attraction or repulsion) by others of the same species.

Ploughdown. Leguminous crop such as red clover or alfalfa, planted for the sole purpose of ploughing back into the soil to replenish soil nutrients.

Regional Monitoring of Pests. Includes listening to the local radio and television news broadcasts for information on pests in the area.

Scouting. Inspection of a field for pests such as insects, weeds or disease.

Soil Testing. Soil test values indicate nutrient deficiencies in the soil, providing direction regarding the amount of nutrients (usually fertilizers) to apply for maximum return.

Summerfallow. Land on which no crops will be grown during the current year. Summerfallow is used mainly on the Prairies to conserve moisture, improve fertility and control weeds.

Tillage. Turning, mixing or inverting the soil surface for weed control, often in the context of an alternative pest control method.

Top Dressing. Applying fertilizer after the crop is up. Top dressing can apply to both broadcasted and banded methods of fertilizer application and is also known as side-dressing.

Treated Seed. Seeds that are pre-treated (coated) with pesticide.



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