THAMES VALLEY
AGRICULTURAL PRACTICES
SURVEY

A questionnaire survey carried out by

C.T.M. Hadwen and Associates,
Applied Research Consultants, Guelph, Ontario

on behalf of

the Thames River Implementation Committee

July, 1978

TABLE OF CONTENTS

ILLUSTRATIONS

INTRODUCTION

The Thames River Implementation Committee was formed in October of 1976 in response to a recommendation contained in the Thames River Basin Water Management Study (1975) that called for a joint committee of government agencies and other appropriate bodies to '*overcome communication and co-ordination problems relating to water management in the basin, and to implement planning on a watershed basis*'.

Representation on the Committee includes the following agencies:

Ministry of Natural Resources

Ministry of the Environment

Upper Thames River Conservation Authority

Lower Thames Valley Conservation Authority

Ontario Ministry of Agriculture and Food

Ministry of Treasury, Economics and Intergovernmental Affairs

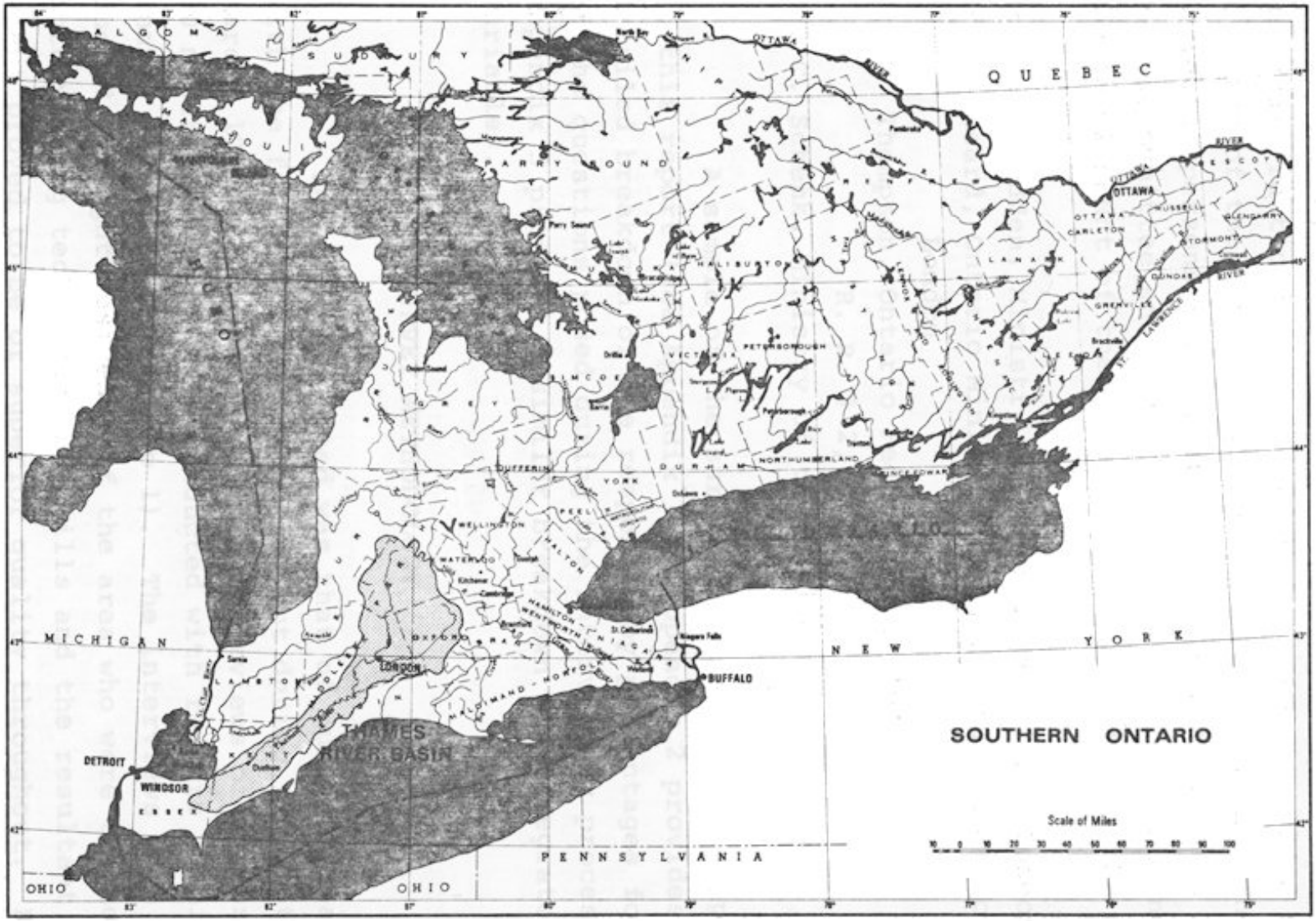
Ministry of Housing

Municipal Engineers Association

Ontario Federation of Agriculture

Three subcommittees of the Thames River Implementation Committee were established to review and assess means of implementing the 29 recommendations contained in the Thames River Basin Water Management Study - namely, the Dams, Reservoirs and Floodplain Management Subcommittee; the Municipal Co-ordination Subcommittee and the Agriculture and Land Use Subcommittee.

Members of this latter Subcommittee decided that a questionnaire survey involving farmers throughout the Thames River Basin would be helpful in obtaining information related to agricultural practices and the perceptions and attitudes of farmers towards water



Map 1. Location and extent of the Thames River Basin.

quality problems, as a basis for verifying the validity and means of implementing various recommendations. Accordingly, arrangements were made with C.T.M. Hadwen and Associates, Applied Research Consultants, Guelph, Ontario, to conduct the Thames Valley Agricultural Practices Survey, based on funding provided by the Ministry of the Environment, Southwestern Region. The following persons participate on the Agriculture and Land Use Subcommittee and were instrumental in contributing to the development of the questionnaire utilized in the survey:

Mr. J. McFadden, Ministry of Natural Resources, London
Mr. R. Heard, Ontario Ministry of Agriculture and Food, London
Mr. K. Thompson, Ontario Federation of Agriculture, R. R. # 2, Blenheim
Mr. C. Schenk, Ministry of the Environment, London

A sample of the survey questionnaire is appended to this report (see Appendix 1). Appendix 2 provides a detailed breakdown of the responses by percentages for each of the questions posed during the interviewing process and Appendix 3 provides a similar breakdown for integrated variables.

SURVEY METHODOLOGY

The method adopted was that of survey research, with the fieldwork being carried out during the month of March, 1978. Personal, in-depth interviews of approximately 30 minutes duration were conducted with farmers within the Thames River Basin (see Map 1). The interviews were conducted by eight residents of the area who were trained in interviewing techniques and skills and the resultant interviews proved to be of superior quality throughout. Responses were coded, edited, punched on computer cards and processed to yield the results presented in this report. The survey data obtained were

computer analysed, using for the most part straightforward correlational techniques.

Sample Selection

The universe for the sample selected was estimated from detailed maps provided by staff of the Ministry of the Environment at London, Ontario. From the maps it was determined that there were approximately 10,000 units which appeared to be probable farming operations. Not all of these units were operational farms, as some proved to be inoperative, or the acreage itself was not under cultivation. The sampling universe also included farm units where the inhabitants of the homestead no longer farm themselves, but where the land is in use under some sort of contractual arrangement. The target population consisted only of those units actively engaged in agriculture, thereby excluding alternative rural units. This distinction was established in the course of carrying out field interviews.

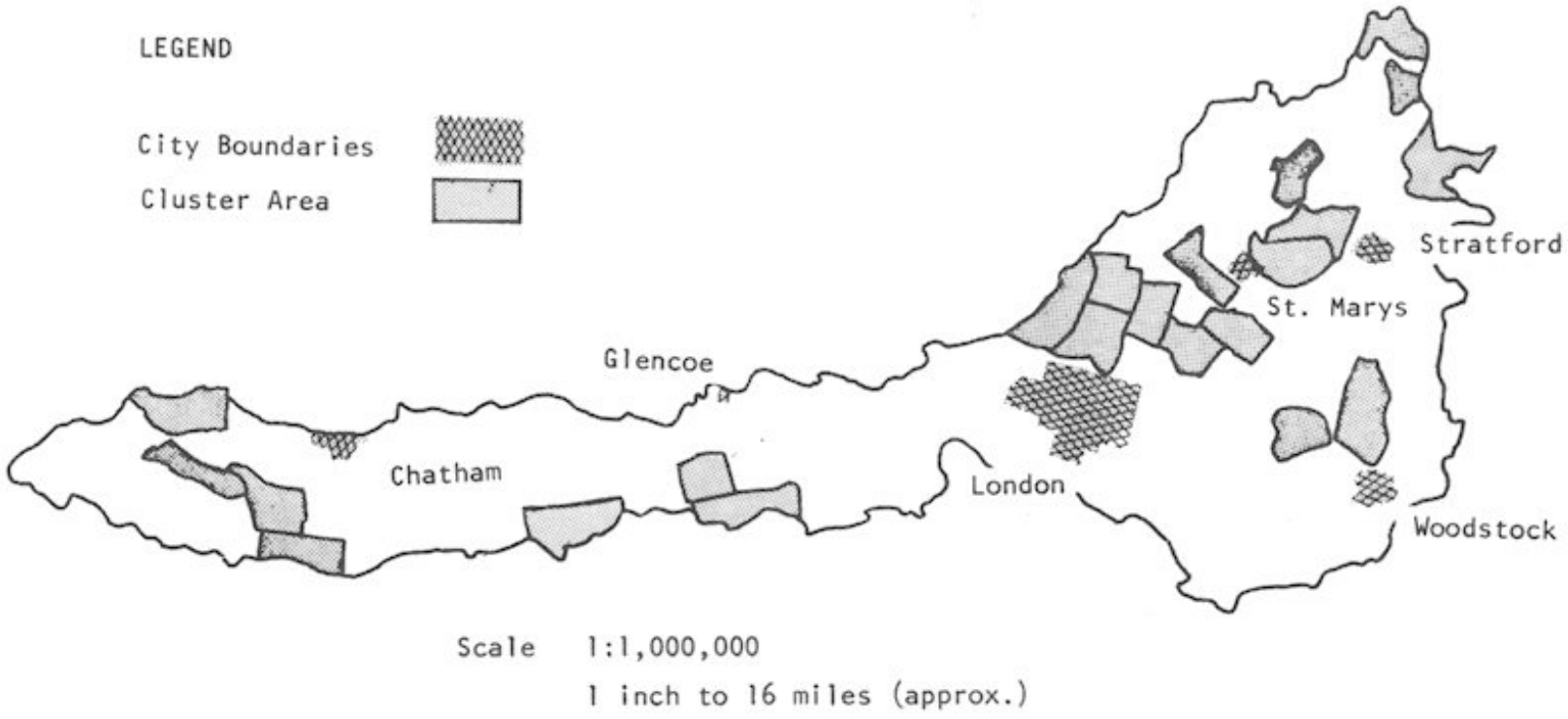
To develop the sample a rather complex scheme of sampling techniques was employed. This process involved designating the geographical boundaries from the maps, followed by area probability clustering into clusters of 100 probable farm units, random selection of 22 clusters, and random assignment of units within each cluster. The maps indicated that the northeastern sector of the Thames River Basin had the greatest concentration of farm units. Random cluster assignments of 100 units provided a high concentration of clusters in this region which were then incorporated proportionately by the random selection process. While agricultural practices do not vary a great deal across the region, it was felt that a great many clusters of small size would effectively include any substantial variations in land use or agricultural operations that are present.

The clustering technique ensured that each cluster had an equal chance of being selected and at the same time ensured representativeness of farming concentrations and variations in land use.

The sample of 22 clusters (see Map 2) represents more than 20% of the farms in the Thames River basin. This provided approximately 2,000 units from which to collect 220 interviews. It was determined that an overrun of 10% or 20 units would be necessary, based on past experience, to account' for incomplete interviews. The remainder of the sampling involved random assignment of numbers from 1 to 100 in a cluster. The interviewers were instructed to pick a central starting point in each cluster and from there to go to every fifth farm in the cluster, until they had completed ten interviews.

Replacement was handled by simply instructing the interviewers to go on to the nearest adjacent farm to the farm in question. Fortunately, this seldom proved necessary and was done only in cases where no one was home, the farm operator was absent for some reason, the operator refused to participate, or the land was either not in cultivation or contracted out. Interviewers reported that this technique worked very well.

The sample represents 3.5% of the farm operators in this region. It is felt that this figure is sufficiently large to give reliable statistical inferences that will be both significant and quite precise, within a narrow confidence range. The sample results can be treated in terms of the assumption of randomness as reliable and compatible with statistical measures which are based on probability. For the purposes of determining land use practices and farmers' attitudes throughout the Thames River Basin, the survey affords a very reliable data base.



Map 2. Sampling clusters - "Thames Valley Agricultural Practices Survey".

Characteristics of Respondents

Of the 220 farmers interviewed, 11% were 65 years of age or older. Thirty-three percent were in the 50 - 64 year-old bracket, and 37% were between the ages of 35 and 49. Nineteen percent of the respondents were 35 years of age or younger.

Thirty-three percent of the respondents had some public school education or had graduated from public school. The largest percentage, 45%, had graduated from or had attended high school. Eighteen percent had graduated from or attended a technical school, and 4% had either graduated from or had some university education.

When asked if they belonged to any agricultural organizations, 54% of the respondents replied that they did. Of these farmers, the largest number (87%) belonged to farm associations, such as Ontario Beef Improvement, Soil and Crop Improvement and Hog Producers. Over three-quarters (79%) belonged to the Federation of Agriculture. Seven percent belonged to either the Provincial or National Farmer's Union, and 11% indicated membership in various other organizations.

Fifty-one percent of the respondents stated their main farm income was obtained from livestock. Thirty percent stated their main income was obtained from crops and 19% stated it was obtained from both crops and livestock. Of the respondents who stated their main farm income was obtained from livestock, 96% also grow crops. Of those stating their main farm income was obtained from crops, only 23% stated they also had livestock.

When asked which type of livestock or livestock product was most important to their farm operation, 23% of the farmers responding stated dairy, 22% beef, 18% hogs and 8% milk. Cow/calf, poultry and eggs accounted for 3% of those responding.

Forty-three percent of the respondents who had livestock felt their operation was intensive, and 31% felt it was not.

When respondents were asked which crop occupied the largest number of acres on their farm, the second largest number of acres, the third largest and the fourth largest, the response was as follows:

Crop Occupying:	Largest No. of Acres	Second Largest No. of Acres	Third Largest No. of Acres	Fourth Largest No. of Acres
		%		
Hay	19	22	13	4
Wheat	1	11	6	7
Mixed grains	11	22	26	8
Corn	47	16	14	6
Soybeans	15	5	3	1
Beans	3	7	1	1
Pasture	1	5	4	4
Market gardening	1	1	2	1
Miscellaneous	1	1	2	2

The section following presents the results of the Thames Valley Agricultural Practices Survey in summary form.

SUMMARY OF RESULTS

1. Soil Tests

Four out of every 5 farm operators in the Thames Valley Region stated that they have had their soil tested for fertilizer needs at some time (Table 6, Page 33). Over one-third have had a test done in the last two years (Table 8, Page 33). These tests are twice as likely to have been done by OMAF as by any other agency (Table 7, Page 33).

2. Phosphorus Fertilizers

Almost all the farmers in this region used a fertilizer containing phosphorus in 1977 (Table 9, Page 34). A majority of farmers decide on their rate of application for phosphorus fertilizer from personal past experience. Slightly more than one-quarter base their decision on a soil test (Table 10, Page 34).

Basis for Decision on Application Rate:	Total	Farmers Who Use Each
Own experience	133	60.5
Soil test report	58	6.4
Fertilizer salesman	11	5.0
Agricultural representative	5	2.3
Neighbours and other	5	2.3
	212*	
Did not use phosphorus	8	4.5
Total sample	220	100%

* Note: 12 respondents answered for years before 1977.

About half the farmers interviewed used phosphorus fertilizer at the recommended rate, but a majority of those who adjusted this rate moved it upwards (Table 11, Page 34). The reason given most often for an upward adjustment was that it would increase the yield, while those who lowered the application rate did so most often on grounds of expense (Table 12, Page 35) .

Almost all farm operators were at least fairly satisfied with the crop response they got from the use of phosphorus fertilizer, and almost 3 out of 5 stated they were either very or extremely satisfied (Table 13, Page 35).

3. Use of Manure

Three-quarters of the farmers interviewed used manure for fertilizer in 1977, most of them in addition to chemical fertilizers rather than as a substitute (Table 14, Page 35; Table 15, Page 36).

4. Watering Livestock

Four out of five farm operators employ pumps to water their livestock. Only about one in eight uses natural watercourses for watering purposes (Table 16, Page 36). Two thirds of those farmers, familiar with livestock, think erosion problems may be caused by cattle movement along the edge of watercourses (Table 17, Page 36). Half the farmers report that fencing is the best method for controlling this type of erosion, while a minority mention pumping water to cattle confinements (Table 18, Page 36).

5. Soil Conservation Practices

Farmers in the Thames River region used a number of soil conservation practices, alone or in combination, in 1977. Crop rotation is used by nearly all farmers. Two in five practised minimum tillage and one in four used cover cropping, or spring ploughing (instead of fall ploughing), to conserve soil quality.

Soil Conservation Practices	Total Farmers Who Practiced Each	
	Freq.	%
Crop rotation	195	88.6
Minimum tillage	84	38.2
Cover cropping	59	26.8
Spring ploughing	58	26.4
Grass waterways	31	14.1
Strip cropping	11	5.0
Contour ploughing	10	4.5
Zero tillage	4	1.8
None of the above	10	4.5

* Note: No totals are reported here because many farmers use more than one conservation technique

As reflected by the Table below, there is slight evidence that a number of farmers are giving some consideration to adopting the various soil conservation practices listed. Those reporting serious consideration may well be the same individuals who followed these practices in 1977.

Soil Conservation Practices*	Total Farmers Giving Each Degree of Consideration					
	Serious		Some		Very Little	
	Freq	%	Freq.	%	Freq.	%
Crop rotation	176	80.0	13	5.9	18	8.2
Minimum tillage	69	31.4	47	21.4	94	42.7
Cover cropping	46	20.9	46	20.9	118	53.6
Spring ploughing	26	11.8	27	12.3	160	72.7
Grass waterways	36	16.4	34	15.5	143	65.0
Strip cropping	10	4.5	15	6.8	191	86.8
Contour ploughing	11	5.0	7	3.2	191	86.8
Zero tillage	6	2.7	8	3.6	193	87.7

* Note: No totals are reported here because many farmers use more than one conservation technique.

About one out of three farm operators anticipates a great deal or a moderate amount of profit reduction if they implement all the available soil conservation practices that they might. Another one-third of these farmers felt profit reduction would be very little, while the remainder were not certain (Table 21, Page 37).

Farmers were asked to report how close to a clearly defined stream or drainage ditch they cultivate. Over one-half of them reported cultivating within ten feet of water-courses, while over two-thirds of them cultivate within 20 feet (Table 22, Page 38).

6. Manure Management

Two-thirds of livestock farm operators in the Thames River region use a solid manure management system. Only a few farmers have liquid or combination systems (Table 23, Page 38).

Twice as many livestock farmers have uncovered manure storage areas as have covered or contained areas (Table 24, Page 38). Most manure storage areas (70%) are more than 500 feet away from a defined stream or drainage ditch (Table 25, Page 38).

Most livestock farmers do not apply manure during the winter months, but one-quarter of them report applying some portion of their annual manure during winter months (Table 26, Page 39).

One-quarter of livestock farm operators in this region apply manure within 20 feet of a watercourse. Four out of five livestock farmers apply manure within 100 feet of a watercourse (Table 27, Page 39).

7. Water Pollution

Two-thirds of all farmers stated they felt farming activities play only a minor role in water pollution. Only about one in seven farmers feel farming activities play a more significant part in reducing water quality (Table 28, Page 39) .

Most farmers felt that bad manure management was the most dangerous source of water pollution associated with farming activities (Table 29, Page 40). Almost every farmer feels his present farm management practices are adequate for controlling water pollution (Table 30, Page 40).

Opinions are sharply divided over what portion of costs farmers should assume for water pollution control on their own properties. One in four feel they should assume full responsibility for costs while one-half of the farmers feel they should be responsible for less than one-half of these costs (Table 31, Page 40).

Farmers are also split as to who should pay the remaining portion of costs for water pollution control. The majority do feel that it should be a government responsibility (Table 32, Page 41).

A majority of farmers think the government should provide them with more information on the control of water pollution from farming activities (Table 33, Page 41).

Only nine farmers in the survey reported adverse effects from water pollution. Clearly most farmers have not experienced or are not aware of experiencing adverse effects (Table 34, Page 41). Only three farmers described water pollution effects which were due to farming activities (Table 35, Page 41).

Less than half the farm operators interviewed stated that they were familiar with the general guidelines of the Ontario Agricultural Code of Practice and/or the Certificate of Compliance (Table 36, Page 42). Among those who are familiar with these guidelines, opinions are evenly divided as to whether or not the government should enforce anti-pollution regulations to reduce water pollution from farming activities (Table 37, Page 42). Analysis suggests that neither those supporting, nor those opposing enforcement can be reliably characterized as coming from a particular age group or educational background (Table 23, Page 56; Table 24, Page 57).

More than half the farmers in the Thames River region state they would be willing to co-operate in a subsidized program to establish water pollution control measures on their farms (Table 38, Page 42). Further analysis reveals that those persons who are willing to pay 100% of the cost for water pollution control on their own properties are also those who are most willing to participate in a subsidized program. Amongst those who are willing to assume at least a portion of costs for their water quality protection, about two-thirds would also co-operate in a subsidized program (Table 22, Page 56). Persons least willing to assume costs were also least willing to co-operate.

Two-thirds of the farmers in this region have not heard that a Thames River water study management report has been issued (Table 39, Page 42). Most of those who have heard of it report the newspaper as the source of their. information (Table 40, Page 43).

The great majority of respondents say they know when their municipal drainage system was last cleaned out, and that this was done within the past 10 years. More than half said this was not done at regular intervals. Few persons are strongly dissatisfied with this service, and most report they are fairly satisfied or very satisfied (Tables 41 and 42, Page 43; Tables 43 and 44 on Page 44).

Few improvements were suggested, as most persons felt none were necessary, but a minority did suggest that catch basins should be cleaned more frequently and a few report tile problems in their area (Table 45, Page 44).

When respondents were asked to rank, in order of importance, the pollution control practices listed below, soil conservation practices, closely followed by farm waste disposal practices, were described as the most effective means.

Pollution Control Practices	Percent of Farmers Giving Each Rank:					
	Most Effective	Second	Third	Least Effective	D.K.	Total
Soil conservation practices	35	27	17	15	6	100
Farm waste disposal practices	29	32	17	15	7	100
Municipal drain management	22	16	22	34	6	100
Stream bank erosion control	10	17	37	30	6	100

8. Attitudes

In this section farmers were asked to express their agreement or disagreement with a number of general statements about agriculture (Refer to Table 47, Page 45). Results show that farmers were nearly evenly divided in their opinions as to whether or not manure can serve as a replacement for commercial fertilizer. Older farmers are split on this notion but younger farmers seem more likely to feel that manure cannot replace commercial fertilizers (Table 26, Page 57).

Six out of seven farmers feel that if a person is getting good yields he is probably following the right fertilizer program.

Fewer than a third of these farmers believe that fertilizer is cheap insurance against poor growing conditions. By a margin of almost 4 to 1, respondents tend to feel that using more phosphate and potash than is recommended by OMAF is not necessary to obtain above average yields. (The 38 respondents who took the minority view include the 37 individuals who previously reported using a higher than recommended application rate

in1977.) Three quarters of the farm operators agree that excess fertilizer use can cause water pollution. (One might recall here that nearly all farmers reported they themselves were not causing water quality problems.)

A large majority of farmers feel applying some starter fertilizer near the seed at planting will increase yields, even on high testing soils. Amongst those who express an opinion, two out of three think that a soil test measures only that portion of soil nutrients that is available to plants. However, a sizeable minority of farmers have no opinion in this case.

Almost half of the farm operators feel that too few decisions are left for them to make independently. Further investigation reveals that this perception is not related to any particular type of farming (Table 27, Page 58) and is not strongly related to any specific level of education (Table 29, Page 58).

When scientific advice and personal judgement are compared, more than twice as many farmers feel their own judgement is the more trustworthy basis for farm decisions.

These last two findings taken together suggest a climate of opinion amongst many respondents which is somewhat protective of farmers' independence, and which may lead to a selective use of scientific advice.

9. Responses for Integrated Variables

This section presents a further exploration of the data as agreed between the consultant and the Agriculture and Land Use Subcommittee of the Thames River Implementation Committee. Principally, it is intended to discover whether the responses

obtained in this study varied amongst different types of farmers, although other sub-groupings of those interviewed were also examined.

Almost 2 out of 3 farmers who say their main income is from crops are cultivating less than 10 feet from a stream or drainage ditch, whereas only about half the livestock operators who have a ditch or stream on their property are cultivating this close (Table 11, Page 51). Livestock farmers may be slightly more aware than others of the extent to which farming activities contribute to water pollution (Table 12, Page 51).

The only difference between crop and livestock farmers in their perceptions of which farming activities contribute most to water pollution concerns manure management. Livestock farmers are much more aware of this problem (Table 13, Page 52).

Livestock farmers were most likely to feel farmers should pay 25-100% of water pollution control costs on their farms, while most crop farmers who had an opinion felt they should pay less than 25% of these costs (Table 14, Page 53).

Livestock farmers appear to be slightly more likely to be familiar with the Ontario Agricultural Code of Practice and/or the Certificate of Compliance. Half the livestock farmers and nearly two-thirds of the crop farmers are familiar with neither of the above (Table 15, Page 53).

Livestock farmers are twice as likely as crop farmers to be willing to co-operate in subsidized programs to establish water pollution control measures (Table 16, Page 53) .

Livestock farmers tend slightly more often to feel that government should pay the remaining costs of water pollution control, although government was selected by a majority of all farmers who answered this question (Table 17, Page 54).

Amongst livestock farmers there are no apparent differences between those who say they are running intensive operations and those who say they are not, with respect to the distance from streams or drainage ditches where manure is stored. There does seem to be a slightly greater tendency for those not claiming to be intensive operators to use a solid manure management system (Table 18, 19 and 20 on Page 55).

There is no significant evidence of a higher level of satisfaction with crop response amongst those who used soil tests as the basis for their decision on the rate of application for phosphorus fertilizer (Table 21, Page 56).

Farmers who say they would be willing to pay at least half the costs of water pollution control on their own properties, also tend heavily to express their willingness to co-operate in a subsidized program of water pollution control. Those willing to pay less than half of these costs tend to be divided in their willingness to co-operate with such a program (Table 22, Page 56).

The belief that manure can replace commercial fertilizer in crop production may be slightly more common amongst livestock than amongst crop farmers, and amongst older than amongst younger farmers, but within these individual groups opinions on this matter tend to be evenly divided (Tables 25 and 26, Page 57).

The feeling that farmers have too few decisions left to make independently is not significantly stronger amongst crop than amongst livestock farmers. It may be slightly more common amongst those 50 years or age or older (Tables 27, 28 and 29, Page 58).

Soil conservation practices in the study area were analysed to reveal any difference between farmers whose main income came from crops and those who depended primarily on livestock. Both crop rotation and cover cropping seem relatively more common amongst livestock farmers, while minimum tillage may be practiced by a slightly larger proportion of crop farmers. In the case of the remaining practices, which are less commonly used in any case by farmers throughout the basin, no significant differences appear (Tables 1 through 8 on Pages 49 and 50).

Livestock farmers appear somewhat more likely than those whose main income comes from crops to feel they would suffer relatively little in the way of profit reduction if they used all the soil conservation practices listed in the questionnaire (Table 10, Page 51).

CONCLUSION

This report presents the results of the Thames Valley Agricultural Practices Survey in summary form. Complete details of the survey results are contained in the tables in Appendix 2.

Most of the tables present nominal data which are not suited to sophisticated statistical manipulation. However, tests for significance were attached to the summarized tables wherever they were appropriate to reveal the strength of the variable association. Full statistical measures are reported in related computer printouts, but in most cases

these are inappropriate for inferential purposes.

While the analyses already presented contain all the major findings of the survey, a few general conclusions may deserve final emphasis. The study revealed that nearly all farmers in the Thames River region feel their present farm management is effectively handling water pollution hazards. Many farmers are not certain as to what water quality protection practices they might agree to employ. They are also uncertain about the costs and apportioning of responsibilities for any sort of program aimed at this problem. A majority would be willing to participate in a water pollution control program on their own properties, if it were subsidized by government. Hopefully this report and the data base it provides will assist the Thames River Implementation Committee's efforts to develop action programs that will increase the effective application of improved agricultural land use practices where required.

ACKNOWLEDGEMENTS

The Agriculture and Land Use Subcommittee wishes to acknowledge that a survey questionnaire developed by the International Reference Group on Great Lakes Pollution from Land Use Activities (PLUARG) for application by Statistics Canada in its 1977 Ontario Agricultural Enumerative Survey served as a basis from which the questionnaire used in this survey was developed. Also, valued assistance was provided by Dr. T. Bates and Dr. M. Miller of the University of Guelph in developing certain aspects of the questionnaire.

APPENDIX 1

QUESTIONNAIRE USED IN THE
THAMES VALLEY AGRICULTURAL PRACTICES SURVEY

THAMES VALLEY AGRICULTURAL PRACTICES SURVEY Page 1

1. A. Is your main farm income obtained from:

crops	(4)*
livestock and livestock products	(3)*
both	(2)*
D.K	(1)

B. (IF EITHER OF ABOVE NOT MENTIONED) Do you also have crops?

Yes (3)*
No (2) *
livestock?
Yes (3) *
No (2) *

C. (IF LIVESTOCK MENTIONED)

(i) Which type of livestock or livestock product is most important in your operation? _____

(ii) Would you describe this as an intensive livestock operation?
Yes (3)* No (2)* D.K. (1)*

D. (IF CROPS MENTIONED)

(i) Which crop occupies the most acres on your farm? _____

(ii) Which other crop occupies the second largest acreage on your farm? _____ (iii) which third? _____
(iv) fourth? _____

2. A. Have you ever had your soil tested for fertilizer needs?
Yes (3) * No (2) * D.K. (1) *

B. By OMAF (3)* or someone else (2)* D.K. (1)*

C. When did you last have a test done? _____ (RECORD ACTUAL YEAR)

3. A. Did you use a fertilizer containing phosphorus in 1977?
Yes (3)* No (2)* (IF NO, SKIP TO Q. 4)
D.K. (1)*

B. Which of the following most influenced your decision on the rate of application for phosphorus fertilizer in 1977?
(ONE ONLY)

(i)	fertilizer sales representative	(1,0)*
(ii)	soil test reports	(1,0)*
(iii)	neighbours	(1,0)*
(iv)	agricultural extension representative	(1,0)*
(v)	own experience	(1,0)*
(vi)	other	(1,0)*

C. Did you try to apply your phosphorus fertilizer at the recommended rate or did you adjust this rate up or down to suit your needs?

Up (4)* Down (3)* As recommended (2)% D.K. (1)*

D. (IF UP OR DOWN, ABOVE) Why did you decide to do that? _____
_____

4. How satisfied were you with the crop response you got from the use of chemical fertilizer containing phosphorus in 1977?

extremely satisfied	(5)*
very satisfied	(4)*
fairly satisfied	(3)*
not very satisfied	(2)*
not at all satisfied	(1)*

5. A. Apart from chemical fertilizers, did you use manure to fertilize any of your land in 1977? Yes (3)*
No (2)* D.K. (1)*

B. (IF YES) Instead of chemical fertilizers or in addition to them?
Instead of (2)* In addition to (1)*

6. A. (IF NO LIVESTOCK IN Q. 1, SKIP TO Q. 7)

For the purpose of watering your livestock, which of the following things do you do?

utilize watercourses, such as streams or open drains	(3)*
pump water to livestock	(2)*
other	(1)*

B. In general, do you think cattle going to water creates erosion problems at the edge of water courses? Yes (3)*
No (2)* D.K. (1)*

C. What would you say is the best method for controlling this kind of erosion?
_____
_____

7. Which of the following practices did you use <u>during 1977?</u>

(i)	strip cropping	(1,0)*
(ii)	contour ploughing	(1,0)*
(iii)	crop rotation	(1,0)*
(iv)	grass waterways	(1,0)*
(v)	minimum tillage	(1,0)*
(vi)	zero tillage	(1,0)*
(vii)	cover cropping	(1,0)*
(viii)	spring (instead of fall) ploughing	(1,0)*
(ix)	none of the above	(1,0)*

8. Thinking of the future, how much consideration do you think you will give to using each of these practices? Serious consideration, some consideration or very little consideration?

		Serious (3)*	Some (2)*	Very Little (1)*
(i)	strip cropping	_____	_____	_____
(ii)	contour ploughing	_____	_____	_____

(iii)	crop rotation	_____	_____	_____
(iv)	grass waterways	_____	_____	_____
(v)	minimum tillage	_____	_____	_____
(vi)	zero tillage	_____	_____	_____
(vii)	cover cropping	_____	_____	_____
(viii)	spring (instead of fall) ploughing	_____	_____	_____

9. Some of these practices may be applicable to your farm. What profit reduction would you anticipate if you used all of them that you could?

A great deal (4)* A moderate amount (3)*
Very little (2)* D. K. (1)*

10. How close to a clearly defined stream or drainage ditch bank do you usually cultivate?

less than 10 feet (5)*
11 to 20 feet (4)*
more than 20 feet (3)*
no clearly defined stream or drainage ditches in or beside fields cultivated (2)*
D.K (1)*

11. (IF NO LIVESTOCK IN Q. i, SKIP TO Q. 15)

What kind of manure management system to you have?

solid (5)*
semi-solid (4)*
liquid (3)*
cannot classify (2)*
combination (1)*

12. A. Is the manure storage area covered or otherwise contained to prevent runoff? Yes (3)* No (2)* D.K. (1)*

B. (IF NO) How close to a clearly defined stream or drainage ditch do you usually store manure?

less than 50 feet	(6)*
50 to 99 feet	(5)*
100 to 299 feet	(4)*
300 to 499 feet.	(3)*
500 feet or more	(2)*
D.K	(1)*

13. Of the total manure you apply to the land, what portion do you usually apply during the winter months (December 1st to March 31st)?

none	(7)*
less than ¼	(6)*
¼ up to ½	(5)*
½ up to ¾	(4)*
¾ or more	(3)*
all	(2)*
D.K	(1)*

14. How close to a clearly defined stream or drainage ditch bank do you usually apply manure?

less than 20 feet	(6)*
20 - 49 feet	(5)*
50 - 99 feet	(4)*
100 feet or more	(3)*
no clearly defined stream or ditches in or beside those fields cultivated	(2)*
D.K	(1)*

15. A. To what extent do you think farming activities contribute to water pollution?

very great extent	(5)*
considerable	(4)*
a minor extent	(3)*
not at all	(2)*
D.K	(1)*

B. Which farming activities do you think contribute most of water pollution?

_____

_____

16. Do you feel that your present farm management practices are adequate for controlling water pollution?

Yes (3)* No (2)* D.K. (1)*

A. Thinking of the cost of water pollution control on their own properties, what portion of this cost do you think farmers should pay themselves?

100%	(5)*
75 - 99%	(4)*
50 - 74%	(3)*
25 - 49%	(2)*
Under 25%	(1)*

B. (IF UNDER 100%) Who do you think should pay the remaining portion of the cost of water pollution control?

_____

18. Do you think the government should provide farmers with more information on the control of water pollution from farming activities?

Yes (3)* No (2)* D.K. (1)*

19. A. Have you or your farming operation experienced any adverse effects from water pollution?

Yes (3)* No (2)* D.K. (1)*

B. (IF YES) Was the source due to farming activities?

Yes (3)* No (2)* D.K. (1)*

20. A. Are you familiar with the general guidelines of the Ontario Agricultural Code of Practice and/or the Certificate of Compliance?

Yes (3)* No (2)* D.K. (1)*

B. (IF YES) Do you think that in order to reduce water pollution from farming activities, governments should strictly enforce anti-pollution regulations?

Yes (3)* No (2)* D.K. (1)*

21. Would you be willing to co-operate in a subsidized program to establish water pollution control measures on your farm?

Yes (3) * No (2)* D.K. (1) *

22. A. Have you heard that a Thames River water management study report has been issued? Yes (3)* No (2)* D.K. (1)*

B. (IF YES) Where did you hear of it? _____

23. A. Do you know when your municipal drainage system was cleaned out last? Yes (3)* No (2)* D.K. (1)*

B. (IF YES) When was that?

less than 10 years ago	(4)*
between 10 - 15 years ago	(3)*
more than 15 years ago	(2)*
D.K	(1)*

C. Is this routinely done at regular intervals?

Yes (3) * No (2)* D.K. (1) *

D. How satisfied would you say you are with the management of your municipal drainage system?

extremely satisfied	(6)*
very satisfied	(5)*
fairly satisfied	(4)*
not very satisfied	(3)*
not at all satisfied	(2)*
D.K	(1)*

What improvements do you feel are needed in the operation of this drainage system? _____

_____

24. These are four ways of controlling water pollution in rural areas. I'd like to know which one you think is:

A) most effective
B) second most effective
C) least effective

i) soil conservation practices _____
ii) farm waste disposal practices _____
iii) municipal drain management _____
iv) stream bank erosion control _____

25. Now I'm going to read some statements that have been made about agriculture. For each one I'd like you to tell me whether you tend most to agree or to disagree.

(a) Manure can replace commercial fertilizers in crop production.
Agree (3)* Disagree (2)* D.K. (1)*

(b) If a person is getting good yields, he is probably following the right fertilizer program.
Agree (3)* Disagree (2) D.K. (1)*

(c) Farmers nowadays have too few decisions that are left for them to make independently.
Agree (3)* Disagree (2)* D.K. (1)*

(d) Extra fertilizer is cheap insurance against poor growing conditions.
Agree (3)* Disagree (2)* D.K. (1)*

(e) In order to get above-average yields, it is necessary to use more phosphate and potash than is recommended by OMAF.

Agree (3)* Disagree (2)* D.K. (1)*

(f) Using more fertilizer than is needed by the crop can cause water pollution.

Agree (3)* Disagree (2)* D.K. (1)*

(g) A good farmer trust scientific advice more than his own judgement on farm decisions.

Agree (3) * Disagree (2)* D.K. (1)*

(h) Applying some starter fertilizer near the seed at planting will increase yields, even on high-testing soils.

Agree (3)* Disagree (2)* D.K. (1)*

(i) A soil test measures only that portion of soil nutrients that is available to plants.

Agree (3)* Disagree (2)* D.K. (1)*

26. Age (ACTUAL YEAR OF BIRTH) _____

27. Education: (RECORD HIGHEST LEVEL)

	Some	Graduated
Public school	(1)*	(2)*
High school	(3)*	(4)*
University	(5)*	(6)*
Technical/Vocational school	(7)*	(8)*

28. A. Do you belong to any agricultural associations?

Yes (3)* No. (2)*

B. (IF YES) Which are these? (i) _____
(ii) _____
(iii) _____
(iv) _____

APPENDIX 2

DETAILED RESPONSES TO BASIC

QUESTIONS PRESENTED IN THE QUESTIONNAIRE

APPENDIX 2

DETAILED RESPONSES TO BASIC QUESTIONS PRESENTED IN QUESTIONNAIRE

Main Farm Income
Also Crops/Livestock
Type of Livestock/Livestock Product Most Important to Operation
Intensive Livestock Operation
Crop Occupying Most, Second Most, Third Most, Fourth Most Number of Acres
Soil Tested for Fertilizer Needs
Who Carried out Soil Test
When Last Test Carried Out
Use of Phosphorus Fertilizer in 1977
Decision for Rate of Application of Phosphorus Fertilizer
Influenced by Application Rate of Fertilizer
Reason for Adjustment in Recommended Rate of Application of Fertilizer
Level of Satisfaction with Crop Response from Use of Phosphorus Fertilizer
Used Manure as Fertilizer in 1977
Used Manure Instead of or In Addition to Chemical Fertilizer
Method of Watering Livestock
Erosion Problems Created by Cattle Going to Water
Best Method of Controlling Erosion Caused by Cattle Going to Water
Practices Used During 1977
Future Consideration to Practices
Profit Reduction Anticipated if Used All Practices Possible
Distance to Stream or Drainage Ditch Cultivated
Type of Manure Management System
Manure Storage Area Covered or Contained
Distance to Stream/Drainage Ditch Manure Stored
Portion of Manure Applied During Winter
Distance to Stream/Drainage Ditch Manure Applied

Extent Farming Activities Contribute to Water Pollution
Farming Activities Contributing Most to Water Pollution
Present Farm Management Practices Adequate for Controlling Water Pollution
Portion of Cost of Water Pollution Control Farmers Themselves Should Pay
Who Should Pay Remaining Portion of Costs of Water Pollution Control
Government Should Provide Farmers With More Information on Water Pollution
Personal Experience of Adverse Effects from Water Pollution Control
Experience of Adverse Effects Due to Farming Activities
Familiar with Ontario Agricultural Code of Practice/Certificate of Compliance
Government Should Strictly Enforce Anti-Pollution Regulations
Willing to Co-operate in Subsidized Program to Establish Water Pollution Control
Heard of Thames River Water Management Study
Source of Knowledge of Thames River Water Management Study
Knowledge of When Municipal Drainage System Cleaned Out Last
When Municipal Drainage System Cleaned
Municipal Drainage System Cleaned Regularly
Level of Satisfaction with Management of Municipal Drainage System
Improvements Needed in Municipal Drainage System
Ways of Controlling Water Pollution
Statements Made About Agriculture - Agree/Disagree
Age
Education
Organization Membership
Which Organization Membership

Table 1
N = 220

Main Farm Income	Number of Respondents
Crops	30%
Livestock/livestock products	51%
Both	19%
	100%

Table 2
N = 220

Also Crops/Livestock	Number of Respondents
If Crops - Also have Livestock	49% Yes
	1% No
If Livestock - Also have crops	7% Yes
	24% No
Stated both in Table	19%
	100%

Table 3
N = 220

Type of Livestock/Livestock Product Most Important to Operation	Number of Respondents
Dairy	23%
Beef	22%
Hogs	18%
Milk	8%
Cow/calf; poultry, eggs	3%
Miscellaneous	1%
No response	25%
	100%

Table 4
N = 220

Intensive Livestock Operation	Number of Respondents
Yes	43%
No.	31%
DK	1%
No response	25%
	100%

Table 5
N = 220

Crop Occupying:	Number of Respondents			
	Most Acres	Second Most	Third Most	Fourth Most
Corn	47%	16%	14%	6%
Soybeans	15%	5%	3%	1%
Hay	18%	22%	13%	4%
Mixed grains	11%	22%	26%	8%
Beans	3%	7%	1%	1%
Wheat	1%	11%	6%	7%
Pasture	1%	5%	4%	4%
Market gardening	1%	1%	2%	1%
Miscellaneous	1%	1%	2%	2%

Table 6
N = 220

Soil Tested for Fertilizer Needs	Number of Respondents
Yes	81%
No	18%
DK	1%
	100%

Table 7
N = 220

Who Carried out Soil Test	Number of Respondents
OMAF	53%
Someone else	28%
DK	1%
NR (No test done)	18%
	100%

Table 8
N = 220

When Last Test Carried out	Number of Respondents
1977 - 1978	23%
1975 - 1976	26%
1970 - 1974	22%
Prior to 1970	11%
NR (No test done)	18%
	100%

Table 9
N = 220

Use of Phosphorus Fertilizer in 1977	Number of Respondents
Yes	91%
No	4%
DK	4%
NR	1%
	100%

Table 10
N = 220

Decision for Rate of Application of Phosphorus Fertilizer Influenced by:	Number of Respondents		
	Yes	No	Total
Fertilizer Sales representative	5%	85%	100%
Soil test reports	26%	74%	100%
Neighbours	1%	99%	100%
Agricultural extension rep.	2%	98%	100%
Own experience	61%	39%	100%
Other	1%	99%	100%

Table 11
N = 220

Application Rate of Fertilizer	Number of Respondents
As recommended	46%
Adjusted rate up	17%
Adjusted rate down	10%
DK	4%
NR	23%
	100%

Table 12
N = 220

Reason for Adjustment in Recommended Rate of Application of Fertilizer	Number of Respondents
Higher yield/better results	9%
Finances available	5%
Use manure also	3%
Regulate according to land	3%
Regulate according to experience	3%
Regulate according to crop	2%
Miscellaneous	3%
NR	73%
	100%

Table 13
N = 220

Level of Satisfaction with Crop Response from use of Phosphorus Fertilizer in1977	Number of Respondents
Extremely satisfied	19%
Very satisfied	38%
Fairly satisfied	33%
Not very satisfied	1%
Not at all satisfied	1%
DK	8%
	100%

Table 14
N = 220

Used Manure as Fertilizer in 1977	Number of Respondents
Yes	76%
No	23%
DK	1%
	100

Table 15
N = 220

Use of Manure Instead Of or In Addition to Chemical Fertilizer	Number of Respondents
In addition to	66%
Instead of	10%
NR (Did not use manure)	24%
	100%

Table 16
N = 220

Method of Watering Livestock	Number of Respondents
Pump water	65%
Utilize watercourses	9%
Other	2%
NR	24%
	100%

Table 17
N = 220

Erosion Problems Created by Cattle Going to Water	Number of Respondents
Yes	47%
No	22%
DK	7%
NR	24%
	100

Table 18
N = 220

Best Method of Controlling Erosion Caused by Cattle Going to Water	Number of Respondents
Fencing	33%
Pump water to livestock	8%
Controlled access	4%
Build up land/banks	2%
Miscellaneous	11%
DK	4%
NR	38%
	100%

Table 19
N = 220

Practices Used During1977	Number of Respondents		
	Yes	No	Total
Strip cropping	5%	95%	100%
Contour ploughing	5%	95%	100%
Crop rotation	89%	11%	100%
Grass waterways	14%	86%	100%
Minimum tillage	38%	62%	100%
Zero tillage	2%	98%	100%
Cover cropping	27%	73%	100%
Spring ploughing	26%	74%	100%
None of the above	5%	95%	100%

Table 20
N = 220

Future Consideration to Practices	Number of Respondents			
	Serious Consideration	Some Consideration	Very Little	Total
Strip cropping	5%	7%	88%	100%
Contour ploughing	5%	3%	92%	100%
Crop rotation	86%	6%	8%	100%
Grass waterways	16%	16%	68%	100%
Minimum tillage	31%	21%	8%	100%
Zero tillage	3%	4%	93%	100%
Cover cropping	21%	21%	58%	100%
Spring ploughing	12%	12%	76%	100%
None of the above	0%	0	0%	0%

Table 21
N = 220

Profit Reduction Anticipated if Used All Practices Possible	Number of Respondents					
	Great Deal	Moderate Amount	Very Little	DK	NR	Total
	15%	20%	32%	30%	3%	100%

Table 22
N = 220

Distance to Stream or Drainage Ditch Cultivated	Number of Respondents
Less than 10 feet	51%
11 to 20 feet	22%
More than 20 feet	10%
No stream or drainage ditch	16%
DK	1%
	100%

Table 23
N = 220

Type of Manure Management System	Number of Respondents
Solid	62%
Semi-solid	3%
Liquid	6%
Combination	6%
NR	23%
	100%

Table 24
N=220

Manure Storage Area Covered/Contained	Number of Respondents
No	52%
Yes	25%
NR	23%
	100%

Table 25
N = 220

Distance to Stream/Drainage Ditch Manure Stored	Number of Respondents
Less than 50 feet	1%
50 - 99 feet	1%
100 - 299 feet	4%
300 - 499 feet	8%
500 feet or more	43%
DK	1%
NR	42%
	100%

Table 26
N = 220

Portion of Manure Applied During Winter	Number of Respondents
None	38%
Less than ¼	16%
¼ up to ½	11%
½ up to ¾	4%
¾ or more	5%
All	2%
DK	1%
NR	23%
	100%

Table 27
N = 220

Distance to Stream/Drainage Ditch Manure Applied	Number of Respondents
Less than 20 feet	18%
20 - 49 feet	18%
50 - 99 feet	8%
100 feet or more	14%
No clearly defined stream/ditch	17%
DK	2%
NR	23%
	100%

Table 28
N = 220

Extent Farming Activities Contribute to Water Pollution	Number of Respondents
Very great extent	3%
Considerable extent	14%
A minor extent	65%
Not at all	11%
DK	7%
	100%

Table 29
N = 220

Farming Activities Contributing Most to Water Pollution	Number of Respondents
Poor manure management	24%
Spraying/insecticides	13%
Chemicals	11%
Livestock	10%
Over-fertilization	9%
Cash cropping	4%
Liquid manure	4%
Miscellaneous	5%
None (farms don't pollute)	8%
DK	7%
NR	5%
	100%

Table 30
N = 220

Present Farm Management Practices Adequate for Controlling Water Pollution	Number of Respondents
Yes	95%
No	3%
DK	2%
	100

Table 31
N = 220

Portion of Cost of Water Pollution Control Farmers Themselves Should Pay	Number of Respondents
100%	22%
75 - 99%	4%
50 - 74%	9%
25 - 49%	10%
Under 25%	39%
DK	16%
	100%

Table 32
N = 220

Who Should Pay Remaining Portion of Costs of Water Pollution Control	Number of Respondents
Government	26%
Provincial government	12%
Society in general	5%
Rural/urban governments	4%
Local industries	3%
Consumers	3%
Miscellaneous	6%
DK	11%
NR	30%
	100%

Table 33
N = 220

Government Should Provide Farmers With More Information on Water Pollution Control	Number of Respondents
Yes	60%
No	32%
DK	8%
	100%

Table 34
N = 220

Personal Experience of Adverse Effects From Water Pollution	Number of Respondents
No	95%
Yes	4%
DK	1%
	100%

Table 35
N = 220

Experience of Adverse Effects Due to Farming Activities	Number of Respondents
No	3%
Yes	1%
NR	96%
	100%

Table 36
N = 220

Familiar with Ontario Agriculture Code of Practice/Certificate of Compliance	Number of Respondents
No	52%
Yes	43%
DK	5%
	100%

Table 37
N = 220

Governments Should Strictly Enforce Anti-Pollution Regulations	Number of Respondents
Yes	21%
No	20%
DK	7%
NR	52%
	100%

Table 38
N = 220

Willing to Co-operate in Subsidized Program to Establish Water Pollution Control	Number of Respondents
Yes	52%
No	29%
DK	18%
NR	1%
	100%

Table 39
N = 220

Heard of Thames River Water Management Study	Number of Respondents
No	66%
Yes	32%
DK	2%
	100%

Table 40
N = 220

Source of Knowledge of Thames River Water Management Study	Number of Respondents
Newspaper	13%
Neighbours and friends	4%
Media	3%
Committees ("Save the Thames","Thames Investigation")	2%
Radio	2%
Meetings	1%
Miscellaneous	3%
DK	1%
NR	71%
	100%

Table 41
N = 220

Knowledge of When Municipal Drainage System Cleaned out Last	Number of Respondents
Yes	75%
No	15%
DK	3%
NR	7%
	100%

Table 42
N = 220

When Municipal Drainage System Cleaned	Number of Respondents
Less than 10 yrs ago	58%
Between 10-15 yrs ago	14%
More than 15 yrs ago	5%
DK	3%
NR	20%
	100%

Table 43
N = 220

Municipal Drainage System Cleaned Regularly	Number of Respondents
No	47%
Yes	19%
DK	15%
NR	19%
	100%

Table 44
N = 220

Level of Satisfaction with Management of Municipal Drainage System	Number of Respondents
Extremely satisfied	3%
Very satisfied	26%
Fairly satisfied	43%
Not very satisfied	14%
Not at all satisfied	4%
DK	5%
NR	5%
	100%

Table 45
N = 220

Improvements Needed in Municipal Drainage System	Number of Respondents
None	28%
Clean catch basins more often	13%
Tile problems - more capacity; deeper	6%
Better inspectors and/or engineers	3%
More "co-operation"	3%
Better management	2%
Less "red tape"; more equal costing	2%
Miscellaneous	15%
DK	4%
NR	24%
	100%

Table 46
N = 220

Ways of Controlling Water Pollution	Number of Respondents					
	Most Effective	Second Most Effective	Third Most Effective	Least Effective	DK	Total
Soil Conservation Practices	35%	27%	17%	15%	6%	100%
Farm Waste Disposal Practices	29%	32%	17%	15%	7%	100%
Municipal Drain Management	22%	16%	22%	34%	6%	100%
Stream Bank Erosion Control	10%	17%	37%	30%	6%	100%

Table 47
N = 220

Statement:	Number of Respondents			
	Agree	Disagree	DK	Total
Manure can replace commercial fertilizers in crop production	45%	53%	2%	100%
If a person is getting good yields, he is probably following the right fertilizer program	83%	16%	1%	100%
Farmers nowadays have too few decisions that are left for them to make independently	45%	48%	7%	100%
Extra fertilizer is cheap insurance against poor growing conditions	28%	68%	4%	100%
In order to get above-average yields, it is necessary to use more phosphate and potash than is recommended by OMAF	17%	69%	14%	100%
Using more fertilizer thanis needed by a crop can cause water pollution	69%	21%	10%	100%
A good farmer trusts scientific advice more than his own judgement on farm decisions	30%	66%	4%	100%
Applying some starter fertilizer near the seed at planting will increase yields, even on high-testing soils	74%	14%	12%	100%
A soil test measures only that portion of soil nutrients that is available to plants	51%	23%	26%	100%

Table 48

N = 220

Age	Number of Respondents
65 years and older	11%
50 - 64 years	33%
45 - 49 years	16%
40 - 44 years	9%
35 - 39 years	12%
30 - 34 years	7%
21 - 29 years	11%
20 years and younger	1%
	100%

Table 49

N = 220

Education	Number of Respondents
Some public school	6%
Graduated public school	27%
Some high school	26%
Graduated high school	19%
Some Technical/Vocational school	8%
Graduated Technical / Vocational school	10%
Some university	1%
Graduated university	3%
	100%

Table 50

N = 220

Organization Membership	Number of Respondents
Yes	54%
No	46%
	100%

Table 51

N = 220

Which Organization Membership	Number of Respondents
Farm Associations	85%
Federation of Agriculture	79%
Farmer's Union (Prov./ National)	7%
Marketing Boards	4%
Miscellaneous	11%
NR (No organization membership)	46%

(These percentages are based on the number of respondents who belong to organizations and since some belong to more than one organization, do not total to 100%)

APPENDIX 3

DETAILED RESPONSES FOR

INTEGRATED VARIABLES

APPENDIX 3

DETAILED RESPONSES FOR INTEGRATED VARIABLES

Main Farm Income X Used Strip Cropping in 1977
Main Farm Income X Used Contour Ploughing in 1977
Main Farm Income X Used Crop Rotation in 1977
Main Farm Income X Used Grass Waterways in 1977
Main Farm Income X Used Minimum Tillage in 1977
Main Farm Income X Used Cover Cropping in 1977
Main Farm Income X Used Zero Tillage in 1977
Main Farm Income X Used Spring Ploughing in 1977
Main Farm Income X Used None Mentioned in Tables 1 - 8
Main Farm Income X Profit Reduction Expected if Used All in Tables 1 - 8
Main Farm Income X Distance to Stream or Drainage Ditch Cultivated
Main Farm Income X Extent Farming Activities Contribute to Water Pollution
Main Farm Income X Which Farming Activities Contribute Most to Water Pollution
Main Farm Income X Portion of Cost of Water Pollution Control Farmers Should Pay
Main Farm Income X Familiar with Agricultural Code of Practice/Cert. of Compliance
Main Farm Income X Willing to Co-operate in Subsidized Program to Establish Water Pollution Control Measures
Main Farm Income X Who Should Pay Remaining Cost of Water Pollution Control
Intensive Livestock Operation X Manure Management System
Intensive Livestock Operation X Manure Storage Area Covered/Contained
Intensive Livestock Operation X Distance to Stream/Drainage Ditch Manure Stored
Soil Test Report Most Influential in Rate of Application for Phosphorus
Fertilizer in 1977 X Level of Satisfaction with Crop Response
Portion of Water Pollution Control Cost Farmers Should Pay Themselves X Willingness to Co-operate in Subsidized Program of Water Pollution Control
Government Should Strictly Enforce Anti-pollution Regulations to Reduce Pollution X Age
Government Should Strictly Enforce Anti-pollution Regulations to Reduce Pollution X Education
Manure Can Replace Commercial Fertilizer in Crop Production X Main Farm Income
Manure Can Replace Commercial Fertilizer in Crop Production X Age
Farmers have too few decisions left to make independently X Main Farm Income
Farmers have too few decisions left to make independently X Age
Farmers have too few decisions left to make independently X Education

Table 1

N = 220

Main Farm Income	Used Strip Cropping in 1977 (%)		
	Yes	No	Total
Crops	1	29	30
Livestock/livestock products	3	48	51
Both	2	17	19
Level of significance = 0.16			100

Table 2

N = 220

Main Farm Income	Used Contour Ploughing in 1977 (%)		
	Yes	No	Total
Crops	1	29	30
Livestock/livestock products	2	49	51
Both	2	17	19
Level of significance = 0.58			100

Table 3

N = 220

Main Farm Income	Used Crop Rotation in 1977 (%)		
	Yes	No	Total
Crops	25	5	30
Livestock/livestock products	47	4	51
Both	17	2	19
Level of significance = 0.10			100

Table 4

N = 220

Main Farm Income	Used Grass Waterways in 1977 (%)		
	Yes	No	Total
Crops	1	29	30
Livestock/livestock products	7	44	51
Both	6	13	19
Level of significance = 0.00			100

Table 5

N = 220

Main Farm Income	Used Minimum Tillage in1977 (%)		
	Yes	No	Total
Crops	12	18	30
Livestock/livestock products	17	34	51
Both	9	10	19
Level of significance = 0.22			100

Table 6

N = 220

Main Farm Income	Used Zero Tillage in1977 (%)		
	Yes	No	Total
Crops	0	30	30
Livestock/livestock prod0	1	50	51
Both	1	18	19
level of significance			100

Table 7

N = 220

Main Farm Income	Used Cover Cropping in 1977 (%)		
	Yes	No	Total
Crops	4	26	30
Livestock/livestock products	17	34	51
Both	7	12	19
Level of significance = 0.00			100

Table 8

N = 220

	Used Spring Ploughing in1977 (%)		
Main Farm Income	Yes	No	Total
Crops	7	23	30
Livestock/livestock products	11	40	51
Both	8	11	19
Level of significance = 0.01			100

Table 9

N = 220

Main Farm Income	Used None Mentioned in Tables 1- 8 (%)		
	Yes	No	Total
Crops	2	28	30
Livestock/livestock products	2	49	51
Both	1	18	19
Level of significance = 0.35			100

Table 10

N = 220

Main Farm Income	Profit Reduction Expected if Used All in Tables 1-8 (%)					
	Great Deal	Moderate Amount	Very Little	DK	NR	Total
Crops	8	4	4	13	1	30
Livestock/livestock products	5	9	23	12	2	51
Both	2	6	5	5	1	19
Level of significance = 0.00						100

Table 11

N = 220

Main Farm Income	Distance to Stream or Drainage Ditch Cultivated (%)					
	Less than 10 feet	11-20 feet	More than 20 feet	No ditch/ stream	NR	Total
Crops	19	8	1	2	0	30
Livestock/livestock products	22	10	7	11	1	51
Both	9	5	2	3	0	19
Level of significance = 0.02						100

Table 12

N = 220

Main Farm Income	Extent Farming Activities Contribute to Water Pollution (%)					
	Very Great	Considerable	Minor	Not at all	DK	Total
Crops	2	1	18	4	5	30
Livestock/livestock products	0	9	35	6	1	51
Both	1	4	12	1	1	19
Level of significance = 0.00						100

Table 13

N = 220

Main Farm Income	Which Farming Activities Contribute Most to Water Pollution (%)												
	None	Chemicals	Spraying/ Insecticides	Cash Crop	Poor Manure Management	Liquid Manure	Live-stock	Fertilizing	Intensive Farming	Misc.	DK	NR	Total
Crops	5	3	4	1	2	1	4	3	0	1	5	1	30
Livestock/livestock products	3	5	3	2	18	3	5	3	1	3	1	4	51
Both	0	2	6	1	3	1	1	1	3	0	0	1	19
Level of significance = 0.00													100

Table 14

N = 220

	Portion of Cost of Water Pollution Control Farmers Should Pay (%)						
Main Farm Income	100	75-99	50-74	25-49	Under 25	NR	Total
Crops	3	1	1	1	15	9	30
Livestock/livestock products	15	2	7	6	17	4	51
Both	5	1	1	2	7	3	19
Level of significance = 0.00							100

Table 15

N = 220

	Familiar with Ontario Agricultural Code of Practice and/or Certificate of Compliance (%)			
Main Farm Income	Yes	No	DK	Total
Crops	9	19	2	30
Livestock/livestock products	25	26	0	51
Both	9	8	2	19
Level of significance = 0.00				100

Table 16

N = 220

	Willing to co-operate in Subsidized Program to Establish Water Pollution Control Measures (%)				
Main Farm Income	Yes	No	DK	NR	Total
Crops	10	12	8	0	30
Livestock/livestock products	31	12	7	1	51
Both	12	5	2	0	19
Level of significance = 0.00					100

Table 17

N = 220

Main Farm Income	Who Should Pay Remaining Cost of Water Pollution Control (%)												
	No One	Gov't in general	Prov. Gov't	Society	Cities	Local Industry	Rural/Urban Gov't	Consumers	Control Enforcers	Misc.	DK	NR	Total
Crops	0	6	3	1	0	1	2	1	1	2	8	5	30
Livestock/ livestock products	1	17	5	2	1	1	1	1	0	1	1	20	51
Both	0	3	3	2	0	1	1	1	0	1	1	6	19
Level of significance = 0.00													100

Table 18

N = 220

Intensive Livestock Operation	Manure Management System (%)							
	Solid	Semi-solid	Liquid	Cannot Classify	Combination	DK	DK NR	Total
Yes	32	1	5	0	5	0	0	43
No	28	1	1	0	1	0	0	31
DK	1	0	0	0	0	0	0	1
NR	1	0	1	0	0	0	23	25
Level of significance = 0.0								100

Table 19

N = 220

Intensive Livestock Operation	Manure Storage Area Covered or Otherwise Contained (%)				
	Yes	No	DK	NR	Total
Yes	15	28	0	0	43
No	9	21	1	0	31
DK	0	1	0	0	1
NR	0	1	0	2	25
Level of significance = 0.0					100

Table 20

N = 220

Intensive Livestock Operation	Distance to Stream/Drainage Ditch Manure is Stored (%)							
	Less than 50 ft.	50 - 99 ft.	100-299 ft.	300- 499 ft.	500 ft. Or more	DK	NR	Total
Yes	1	1	1	5	25	0	0	43
No	1	0	2	3	17	0	8	31
DK	0	0	0	0	0	1	0	1
NR	0	0	0	0	1	0	24	25
Level of significance = 0.0								100

Table 21

N = 220

Soil Test Report Most Influential in rate of Application for Phosphorus Fertilizer in 1977	Level of Satisfaction with Crop Response (%)						
	Extremely Satis.	Very Satis.	Fairly Satis.	Not Very Satis.	Not at All Satis.	DK	Total
No	13	28	23	1	1	8	74
Yes	5	11	9	0	0	1	26
Level of significance = 0.34							100

Table 22

N =220

Portion of Water Pollution Control Cost Farmers Should Pay Themselves (%)	Willingness to Co-operate in Subsidized Program of Water Pollution Control (%)				
	Yes	No	DK	No Response	Total
100	15	3		0	22
75 - 99	3	1	1	0	5
50 - 74	6	1	2	0	9
25 - 49	6	2	1	0	9
Under 25	16	15	6	1	38
DK	6	7	4	0	17
Level of significance = 0.02					100

Table 23

N = 220

Government Should Strictly Enforce Anti-Pollution Regulations to Reduce Water Pollution	Age (%)								
	64 yrs. & older	50-64	45-49	40-44	35-39	30-34	21-29	20 yrs or under	Total
Yes	2	6	5	2	2	2	2	0	21
No	2	6	4	1	3	1	3	0	20
DK	1	2	2	0	1	0	1	0	7
No Response (Not applicable due to response to previous question)	7	19	5	6	5	4	5	1	52
Level of significance = 0.93									100

Table 24

N = 220

Government Should Strictly Enforce Anti-Pollution Regulations to Reduce Water Pollution — Education (%)

	Public School		High School		University		Tech./Voc.		
	Some	Grad.	Some	Grad.	Some	Grad.	Some	Grad.	Total
Yes	1	7	3	3	1	2	2	2	21
No	1	3	7	3	0	1	2	3	20
DK	1	1	2	1	0	0	I	1	7
No Response (Not applicable due to response to previous question)	3	14	14	12	1	1	3	4	52
Level of significance = 0.56									100

Table 25

N = 220

Manure Can Replace Commercial Fertilizer in Crop Production — Main Farm Income (%)

	Crop	Livestock	Both	Total
Disagree	17	26	10	53
Agree	11	25	9	45
DK	1	1	0	2
Level of significance = 0.41				100

Table 26

N=

Manure Can Replace Commercial Fertilizer in Crop Production — Age (%)

	65yrs.& older	50-64	45-49	40-44	35-39	30-34	21-29	20 yrs. or under	Total
Disagree	6	17	8	3	8	4	7	0	53
Agree	3	16	8	5	4	2	5	1	44
DK	1	1	0	1	0	0	0	0	3
Level of significance = 0.08									100

Table 27

N = 220

Farmers have too few decisions left to make independently	Main Farm Income (%)			
	Crop	Livestock	Both	Total
Disagree	14	25	9	48
Agree	13	23	9	45
DK	2	4	1	7
Level of significance = 0.93				100

Table 28

N = 220

Farmers have too few decisions left to make independently	Age (%)								
	65 yrs. & older	50-64	45-49	40-44	35-39	30-34	21-29	20 yrs. or under	Total
Disagree	2	15	9	5	7	3	7	0	48
Agree	7	17	6	4	4	3	4	0	45
DK	1	1	1	1	1	1	1	0	7
Level of significance = 0.13									100

Table 29

N = 220

Farmers have too few decisions left to make independently	Education (%)								
	Public School		High School		University		Tech./Voc.		Total
Disagree	Some	Grad.	Some	Grad.	Some	Grad.	Some	Grad.	
	2	14	11	7	0	1	4	5	44
Agree	2	11	14	9	1	2	5	5	49
DK	1	2	1	1	1	0	0	1	7
Level of significance = 0.58									100