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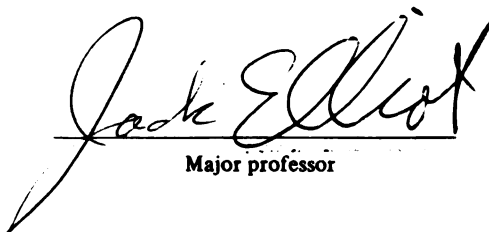
MICHIGAN AGRICULTURAL ISSUES

presented by

GWEN BETZOLD DADO

has been accepted towards fulfillment  
of the requirements for

M.S. degree in Agricultural & Extension  
Education

  
Major professor

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**MICHIGAN AGRICULTURAL ISSUES**

**By**

**Gwen Betzold Dado**

**A THESIS**

**Submitted to  
Michigan State University  
in partial fulfillment of the requirements for the degree of**

**MASTER OF SCIENCE**

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## ABSTRACT

### Michigan Agricultural Issues

By

Gwen Betzold Dado

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Agricultural issues and concerns are most often identified by people within agriculture. However, consumers are affected by the food and fiber industry daily and should be included in identifying issues that affect this system.

The researcher surveyed two groups of consumers the objectives were to identify consumer-type agricultural issues and to ascertain the differences and similarities between issues identified by consumers and issues identified by agriculturalists.

The surveys were conducted using the Delphi process. There were two Delphis used, the three-stage Delphi participants determined importance of twenty issues that were identified via the review of literature; the four-stage participants identified their own twenty issues. This process allowed direct comparisons to be drawn between the issues identified by agriculturalists and the issues identified by consumers.

The findings indicated there were eleven issues that consumers identified that were not issues identified in the review of literature.

To my parents  
for giving me my  
agricultural roots.

## ACKNOWLEDGEMENTS

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## CHAPTER I

### INTRODUCTION

Michigan is an agricultural state. It ranks third or higher among all the states in the U.S. in twenty different crops and ranks number one in the production of eleven commodities. Blueberries, bedding plants, dry beans, red tart cherries, pickling cucumbers, and potted geraniums are among the eleven number one commodities (Michigan Department of Agriculture, 1988). Michigan agriculture is diverse. Although only two percent of Michigan's people are employed in production agriculture, another fifteen percent of Michigan's citizens are employed in other parts of the food and agriculture system. The food and agriculture sector is the state's second largest employer (Futures Team, 1990).

Even though agriculture plays a dominant role in Michigan's economic well-being, it is still not an esteemed area. "The public perceives agriculture as an outmoded industry....Its economic impact and investment opportunities are not well known (Futures Team, 1990). The public composes the other 83 percent of the population in Michigan that is not directly involved in the food and agricultural system. They are, however, very important to Michigan agriculture because they are the consumers of agricultural products. They also represent the majority of the population, and if the public does not understand the food and agricultural system it should be the agriculturalists responsibility to provide them with information.

Currently in Michigan there are approximately 135 high school agricultural education programs. These agricultural programs are offering an agriscience-oriented curriculum. The curriculum uses production agriculture as a base, but extends it to integrate science concepts. These high school programs do an excellent job of educating young people, but due to increasing high school graduation requirements, fewer students have the opportunity to learn directly from these classes.

There has been movement in Michigan to incorporate agriculture into elementary curriculums. Through Farm Bureau's Ag in the Classroom, the Summer Institute for Educators offered by Michigan State University's Agricultural and Extension Education department, and three school systems that have employed an agricultural literacy coordinator, educating elementary students about agriculture and its importance in Michigan and in their lives is becoming a reality.

Nonetheless, something should be done to work directly with today's consumers. Michigan Department of Agriculture's Futures Team in their report, "Reaching 2020," stressed the importance of the consumer; "To thrive in the new century, Michigan food and agriculture industry must be driven by consumers demand, not by production capabilities." For example, even though Michigan dairy producers are very good at maintaining butterfat production, if consumers want low fat dairy products then producers must find some other use for this product or alter production strategies to meet consumer desires.

Michigan Department of Agriculture along with other agriculturalists understand the need to know consumers and to understand their concerns. They also know that consumers' needs and wants change as lifestyles change. Yet, what has been done to identify consumers concerns?

Currently in Michigan consumers do not play a large role in setting agricultural research agendas. Since agriculturalists know they need to serve the consumer, this is a situation that should be rectified.

In this study consumers had the opportunity to identify agriculturally-related issues they felt were important. Using the Delphi technique, consumers, through a series of questionnaires, identified their top twenty issues. With a better understanding of consumers' concerns and expectations, agriculturalists will be able to focus their efforts in creating an agriculturally literate society and

in meeting the demands of this constituency.

#### Purpose of the Study

The primary purpose of the study was to identify the concerns of Michigan people as they relate to the environment, food production and consumption, the use of Michigan land (forests, state parks, shorelines, etc.), pollution, and international food trade.

#### Objectives

1. To identify consumer-type agricultural issues that are of concern to Michigan people.
2. To ascertain differences and similarities between issues identified by consumers and issues identified from research.

#### Definition of Terms

##### Delphi Technique

A group process technique for eliciting, collating and generally directing informed judgement towards a consensus on a particular topic. (Delp, Thesen, Motiwalla, and Seshardri 1977).

##### Dunning

The process of recontacting participants who failed to return their questionnaires.

##### Systematic random sample

All members of the defined population are placed on a list for random selection and every  $k^{\text{th}}$  case is taken from the list. (Ary, Jacobs, and Razavieh, 1990) e.g., every sixth person is chosen after a random starting place is selected.

##### Target group

A group of individuals with certain common characteristics. In this study, the target group was Michigan residents.

### Abbreviations

- CES** Cooperative Extension Service
- MDA** Michigan Department of Agriculture
- MI** Michigan, this abbreviation was often used by respondents to represent Michigan.
- SAESs** State Agricultural Experiment Stations.

### Limitations

This study had the following limitations:

1. Other than home addresses no demographics were collected. Consequently, there was no method of collecting gender or age of respondents. This could have affected the issues that were identified and the rankings.

### Assumptions

1. All respondents understood the questionnaire directions and truthfully completed the questionnaire.
2. High participant interest and commitment was assumed.

### Overview

The purpose of the study, research questions, definition of terms, limitations, and assumptions are discussed in Chapter I. Chapter II focuses on review of literature related to the study. Emphasis was directed towards techniques available for identifying issues. Chapter III describes the methodology used in this study. Results of data collection and analysis are outlined in Chapter IV. The summary of the study along with conclusions, recommendations, and implications are covered in Chapter V.

## CHAPTER II

### REVIEW OF THE LITERATURE

This chapter contains an introduction that discusses historical information about production agriculture, agriculturalist issues, consumer issues as identified by a study and the media, agriculturally literate consumers and the need to share knowledge with consumers, implications of issue identification for agricultural institutions, and an instrument development review.

#### Introduction

The production of food and fiber for the daily needs of humankind has traditionally been an issue of concern for all individuals. Prior to the monumental advances in product output made in the past century, almost every person was actively involved in decisions that directly affected their attainment of food and clothing necessary for survival. Production of these essential items has been channeled to a very small number of high-output individuals, today's agriculturalists. Output has increased substantially. In 1956 a farmer could feed him/herself and 19 others, in 1976 the number increased to 56, and in 1988 the number was up to 78 people fed by one farmer (1976 Yearbook of Agriculture and Michigan Department of Agriculture Press, 1988). The increase in the number of people fed per farmer was not due to increased acres farmed, but rather to increased productivity. Due to production agriculturalists' efficiency American consumers only spend 16 percent of their disposable income for food (1985 Yearbook of Agriculture).

Currently in the state of Michigan, only two percent of the work force is actively involved in farming. Four-fifths of the working population has been nonfarm for over thirty years (Mawby, cited in Douglass, 1985). At the national level similar trends have occurred. In 1850 50 percent of the population consisted of farmers, in 1910 farmers made up 33 percent of the population, in 1950 16.5 percent of the population were farmers, and today two (2) percent of the population

is directly involved in production agriculture. As time and technology continue to widen the gap between production agriculturalists and consumers, consumers have and will become more removed from the decision process used to operate the production system. Today, peoples' concerns still include how they will fulfill their food and clothing needs. However, greater product supply has given them the opportunity to make choices on other issues since less time is spent on decisions about attaining food and fiber.

Of the time spent by modern consumers on decisions relative to food and fiber issues, greater proportions of it are focused on special concerns not directly related to their attainment. Consumers are not only concerned that they can purchase enough products and the types which they prefer, but also that practices that lead to these products are humane and environmentally safe. "... , while the food supply in this country is recognized as high quality, concerns continue to grow about microbial and chemical contamination. The U.S. food and agricultural system is challenged to provide food that is nutritionally balanced, safe, convenient, and affordable." (ESCOP Planning and Budget Subcommittee, 1991). As fewer people become directly involved in production agriculture, it is up to individuals within the agricultural system to educate the public about the food and fiber system. Such education is critical so decisions made by consumers', which may affect the entire agricultural system, are well informed and beneficial for all people.

#### Agriculturalist Issues

The identification of issues relevant to the operation of an enterprise is vital to the enterprise's success (Campbell, 1983). Issue identification serves as the first step of a process known as issue management (Chase, 1977) which enables an enterprise to focus its resources in order to meet its long term objectives. No where is this concept more easily visualized than with corporate business. For



example, the enterprise of agriculture can survive no more easily without issue identification than can a Fortune 500 business. Suppose the long term objective of agriculture is to ensure an adequate supply of food and fiber at reasonable cost to consumers while allowing producers to make a living. Such an objective implies that both agricultural production groups and consumers have the opportunity and responsibility to set the agenda that guides the future direction of agriculture. Issues identified by each group should help write this agenda.

Previous research (Schwartzweller, 1991) that identified problems and critical issues in Michigan agriculture involved two groups, Michigan State University Cooperative Extension Service (CES) agents and members of commodity groups (Table 1). These groups are directly involved with agriculture and understand its importance in Michigan. Extension agents listed three side effects of production agriculture, namely groundwater contamination, animal wastes, and agricultural chemical use, as the top issues facing agriculture. These people often serve as liaisons between agricultural producers and consumers, and, therefore, tended to prioritize issues that are most likely to cause tension between producers and consumers if not resolved. Conversely, as members of commodity groups, producers listed an issue that is directly related to the profitability of their farms for each of their top five issues. Producers were concerned about their viability such as costs (property taxes, farm equipment) or income (agriculture policy, farm management, international trade) issues. Both Extension agents and producers were concerned about issues which directly affected the success of their occupations.

Perhaps other agricultural groups have been less biased about issue identification for agriculture. The Michigan Department of Agriculture (MDA) and the State Agriculture Experiment Stations (SAESs) have prioritized agricultural issues in relation to research needs of

the state and nation, respectively. (Table 2 and 3). (The complete list of issues may be found in Appendix B).

**Table 1**

Top five agricultural issues identified by Michigan State University Cooperative Extension Agents (MSU CES) and agricultural commodity groups (Schwartzweller, 1991).

MSU CES	Commodity groups
1. Groundwater contamination.	1. Property taxes on land
2. Animal waste management.	2. Farmer involvement in ag. policy.
3. Safer use of pesticides and herbicides.	3. Management and survival of small farms.
4. Amount of capital needed to begin farming.	4. Farm/machinery equipment costs.
5. Consumer confidence in food products.	5. International trade agreements (agriculture).

**Table 2**

Top research issues identified by the Michigan Department of Agriculture (MDA) ("Reaching 2020," Futures Team, 1990).

MDA - "Reaching 2020"
1. Integrated pest management
2. Alternative agriculture systems
3. Biotechnology
4. Reforestation
5. Food safety
6. Animal waste
7. Health impacts of consumer food choices
8. Packaging safety
9. Recyclable and biodegradable packaging
10. Solid waste disposal

Table 3

Top national research issues as identified by State Agricultural Experiment Stations (SAESs), (Research Agenda for the 1990's Executive Summary, 1991).

SAES - 1990's Executive Summary	
1.	Protecting and enhancing water resources
2.	Compatibility of agriculture, natural resources, and environment
3.	Ensuring food safety
4.	Pest management strategies
5.	Biology & management of plant systems
6.	Improving competitiveness in global markets
7.	Sustaining forest, range, and related natural resources
8.	Biological and genetic enhancement of animal efficiency
9.	Genome mapping and genetic enhancement
10.	Impacts of new agricultural technologies on environment, people, and communities

As expected, issues identified for research are broader in scope than are those listed by CES agents and commodity groups. Water quality, food safety, international agricultural trade, animal waste management, biotechnology and alternative agriculture are the issues in common as identified by these two agencies, yet there exists room for additional issue compatibility between these groups. It is suspected that the research objectives of these groups were to enhance overall productivity of foodstuffs while ensuring environmental preservation and human safety. With such goals, these agencies probably identified issues that are of greater appeal to consumers than those recognized by the earlier groups.

Agriculture is a tremendously diverse enterprise. Achieving a unified voice to obtain a single list of critical issues that face the industry may be an impossible task. Even within an individual commodity group it is difficult to find consensus among all members. For example, dairy farmers from various regions of the U.S. support widely different

forms of milk marketing legislation. With such disunity little can be done at all to improve the market situation since legislators do not know what producers want. If harmony were achieved within a commodity there still remains competition across commodity groups that each have their own agendas as to how to improve agriculture's, and, of course, their own situation. Perhaps the real problem lies in the definition different people use to describe successful agriculture. What is successful for one group of people is likely to be unsuccessful for at least one other group.

Even though consensus on every issue may not be obtained, agriculturalists have achieved a level of productivity that certainly meets most people's definition of success. Such success has enabled large numbers of people to leave agriculture to pursue other interests. Issues of future importance to agriculturalists may not be solely based on product output or market price, but more on the ability to satisfy the desires of the people agriculture has freed, the consumers. If only people within agriculture identify issues critical to agriculture they may miss what consumers need and want. Susan K. Harlander, Department of Food Science and Nutrition, University of Minnesota, discovered this in one of her first biotechnology talks, "Obviously, the technical and scientific information that I felt most comfortable discussing were not issues of upmost concern to that audience." Agriculturalists need to identify what their audience (the consumer) wants and focus attention towards those matters.

#### Consumer Issues

Decisions made by consumers may greatly influence how the agricultural system operates. Consumers directly affect what agricultural products are important by deciding what to buy. In attempts to meet changing consumer preference, agriculturalists introduce over 10,000 new products or product variations in grocery stores every year (1988 Yearbook of Agriculture). As lifestyles change,

consumers request that foods be packaged in convenient forms, be quick and easy to prepare, and promote good health. Consequently, nowhere are consumer decisions felt more strongly by agriculture than in the supermarket. Through direct activities (legislative action, county board membership, protests) or through buying decisions, consumers can also affect agriculture by requesting for change in production, distribution, or research practices. Producers often feel such requests are unjustified because consumers lack adequate knowledge about the issues. However, consumers buy the products and, therefore, must be listened to. Increasing consumer knowledge is something agriculturalists can do something about.

None of the agricultural groups previously cited have included consumers when identifying their issue priorities. In order for agriculturalists to meet consumers' needs it is essential that their issues of priority be identified and incorporated into long term agendas. From a consumer's point of view, an "issue" is "any cultural trend that can become a matter for concern in our society - whether or not it is susceptible to legislative action" (Duke 1983 p.17).

One study that focused on consumers' concerns was conducted by the Department of Agricultural Economics and Rural Sociology at The Pennsylvania State University entitled, "Citizens' View Point Priorities for the 1990s" (Willits, Crider, and Janota, 1990). In this study the question asked to consumers was, "Compared to what is being done now, what priority do you want the following areas to have in the future?" Evaluations were made relative to the current situation as perceived by each consumer; consequently, the responses did not necessarily reflect the absolute priority given to each issue in relation to other issues. Respondents indicated if an item should have "lower", "same", or "higher" priority in the years ahead (Table 4).

Table 4

Citizens' priorities identified as the percentage of respondents wishing to see higher priority placed on specific issues. The top ten issues are included (Willits, et al., 1990).

Issues	% Higher Priority
* Safe disposal of industrial wastes	84.7
* Programs to deal with teenage drug and alcohol abuse	78.6
* Safe drinking water	77.5
* Attention by government to citizen concerns	77.1
* Protection and conservation of the natural environment	73.6
* Programs to reduce teenage pregnancy	71.6
* Safe and efficient sewage disposal	71.1
* Preservation of farmland	70.1
* Repair of state roads and highways	69.8
* Safe use of agricultural chemicals	69.3
* Communication of governmental decisions and policies to citizens	68.6
* Protection from abuse for children, elderly and handicapped	67.3
* Job opportunities for youth	66.3
* Programs to deal with adult drug and alcohol abuse	65.0

Comparing the issue priorities identified by Pennsylvania citizens and issues identified by previously cited Michigan agricultural agencies and the SAESs, similarities include concern for natural resources, safe use of agricultural chemicals, and water quality/safety. Even though these consumers listed some non-agricultural issues as having priority,

seven of the fourteen higher priority issues identified in the Pennsylvania study (safe disposal of industrial wastes, safe drinking water, protection and conservation of the natural environment, preservation of farmland, repair of state roads and highways, and safe use of agricultural chemicals) are related to the agricultural industry and could be included in an agricultural research agenda. Of additional interest was the inclusion of "preservation of farmland" as a relatively high priority among consumers, but this issue failed to be included within the top five priorities of Michigan CES personnel, Michigan commodity groups, or SAESs directors.

Besides controlled studies, where else can consumer issue priorities be found? Such issues may often be identified through media. "It is well established in this country, the media set the public agenda. Newspapers, for example, are not very successful in persuading Americans what to think, but they are enormously successful in convincing us what to think about" (Campbell, 1983).

One issue that was of upmost concern at Michigan State University in 1992 was the concept of animal rights. Headlines such as, "Balancing rights with research" (Ingells, 1992), "Terrorist fire sends 'U' research up in smoke" (Downs, 1992), "Activists strike MSU" (Nichols, 1992), and "Animal Rights Terrorists Make First Appearance in Michigan" (Michigan Farm News, Michigan Farm Bureau, 1992), were common occurrences after animal rights activists vandalized mink research facilities and faculty offices. Even though such headlines do not directly support one side of the issue or the other, merely mentioning the issue directs the reader as to what issues should be of public concern. Of course, this is exactly what the people who conduct such activity want: to set the public issues.

A second issue, water contamination, also makes headlines. "Forgotten but not gone" (Marrison, 1992) was an article concerning the burying of trash and its contamination of groundwater. Groundwater

contamination through trash, chemical use (agricultural and homeowner), and runoff receives media attention because of the human interest relevant to the story.

A third issue, food safety, will occasionally make headlines. Possibly the most remembered food safety issue is the Alar scare that developed due to a CBS broadcast on *60 Minutes*. This scare caused apple prices to drop almost 6% per box and the apple crop to decline 10% because Alar could not be used. Consumers lost confidence in the apple industry for reasons not necessarily well-founded. Food safety involves the assessment of risk; media interpretation of such risk may not be the most scientifically-based advice. "We lost over \$250,000 from that Alar scare alone," says Michigan farmer Roger Kropf (cited in Brooks, 1990). Other commodities have also been traumatized by media interpretation of risk: grapes, bananas, milk, and meat products.

Perhaps the most influential effect on issue identification by the media is their choice of what news to report. Journalists are encouraged to look for the significant news story, report on the unusual, and to find the local angle while maintaining objectivity. However, when reporters write news stories they are making value judgements by selecting the news to report and how to report that news (Davidson, 1990).

After such external molding of consumers' attitudes is it possible to obtain a list of consumer issues that truly reflect their own beliefs? Further still, is it possible for consumers to identify agricultural/natural resource issues and priorities that will benefit the agricultural system and society as a whole? Answers to these questions depend on consumers' ability to educate themselves in many areas so they can formulate their own opinions. Answers further require that the general public maintain an adequate level of agricultural literacy so issues are more than media rhetoric.



### Agriculturally Literate Consumers

Knowing that consumers are bombarded daily with conflicting information about animal welfare, food safety, chemical use, and other agriculturally-related issues, what can be done to assist consumers in untangling the facts from the fiction? Is it important to increase the populations' knowledge of the food and fiber system? Yes.

An agriculturally literate person is someone who understands the food and fiber system and its current economic, social and environmental significance to all people. With such knowledge consumers can not only make better informed personal choices about diet and health but can also wisely participate in establishing issues and setting policies for successfully meeting agriculture's objectives (Understanding Agriculture: New Directions for Education, National Research Council, 1988).

John Pope emphasized the need for an agriculturally literate public, " ...specifically, the real need for an agriculturally literate society is knowledge of the impact the industry, as a whole, has upon our daily lives. Whether economically, environmentally or socially, agriculture impacts us in many ways. The American people rely on agriculture for basic survival needs, for economic needs, and to protect the land. The interrelationship of these areas is why agricultural literacy is a basic need in America." (Pope, 1990)

Becoming agriculturally literate means more than obtaining piecemeal bits of knowledge. "People's inability to look at problems in their entirety, instead of seeing only isolated fragments, is especially severe in regard to agricultural issues" (Mawby, cited in Douglass 1985). This should concern agriculturalists because when a person does not look at the whole, uninformed decision making follows. Consumers often establish priorities based on an incomplete understanding of the issues. Their misunderstandings are frequently due to a lack of information or one-sided information about the agricultural system.

One-sided ideas about agriculture are often generated by groups trying to promote specific agendas, usually in the name of money. J.K. Rosser in his book, "Teenage Mutant Ninja Turtles ABC's for a Better Planet," (1991) used the alphabet to "inform" young people about environmental concerns. A few examples from the book include, "C is for Cruelty-free products," where tests used to check products before selling are cruel to lab animals that can't fight back. "M is for Meat" where cattle are bad because they eat cereal grains that could be used to feed the hungry and expel methane gas that makes the greenhouse effect worse. The author recommends that the young child should eat less meat and eat meat from organically raised beef cows. Finally, "P is for Pesticides" where pesticides are poisons, food in the grocery store may still contain pesticides, and pesticides kill animals that aren't pests. It suggests to the young reader that they buy only organically grown food. When young people are exposed to information not supported by scientific research, is it any wonder that there is confusion about what agriculture is and how it affects each and every person?

Agricultural education is a vehicle that can be used to educate consumers about agricultural concerns. Currently, education occurs in some of our public school systems and through Cooperative Extension Service programs. These two avenues meet specific populations needs. However, if the agricultural industry wanted to make a greater impact in the consumer education arena, should it not begin as early as possible? In "Understanding Agriculture: New Directions for Education," (National Research Council, 1988) it was recommended that "Beginning in kindergarten and continuing through twelfth grade, all students should receive some systematic instruction about agriculture." The idea behind working with young students first is that they have not necessarily developed their biases about agriculture and usually a young person takes information learned at school and shares it at home. By working

with young people agriculturalists could also have an impact on the child's parents and other household occupants. "Neither students nor Americans in general have a realistic view of agriculture's scope, career possibilities, or involvement with scientific progress and the use of sophisticated biological, chemical, mechanical, and electronic technologies." (National Research Council, 1988).

Agriculturalists must take the lead in informing the public about agriculture because no one else will do it. Almost 20 percent of the labor force works for the agricultural industry in some capacity (Petrulis et al., 1987 cited in National Research Council, 1988), which leaves the other 80 percent uninvolved with the industry. Just as other business owners promote their products, so must people involved within agriculture promote their products and business. The more informed the public is, the more educated decisions they can make on issues that affect agriculture. "Few issues are of greater importance to the world than adequate food supplies, proper food use, and knowledge about the components of the agricultural industry. Yet today most people, including those in key positions of public decision-making, do not understand the complexities of America's food system; nor do they fully comprehend its relationship to human nutrition or its impact on international trade and relations." (Mawby, cited in Douglass 1985). The agricultural industry needs to work together to inform consumers about agriculture. However, before the work begins agriculturalists must know what consumers are thinking. Agriculturalists may find that consumers have different agricultural concerns than what the agriculturalists perceive.

#### Implications of Issue Identification for Agricultural Institutions

Duke, (cited in Minnesota Cooperative Extension Service, 1988), reports that systematically identifying, analyzing, and setting priorities among present and emerging public issues allows organizations to anticipate and capitalize upon opportunities in a transitional

society. Issues programming uses issue identification to determine program offerings. "Locating program origins in matters of wide public concern, issues programming identifies human problems in their own context...." "Issues programming focuses initially on the public in its broadest sense, which includes but extends beyond existing audiences and problems, and thus creates a more comprehensive source of program priorities" (Minnesota Cooperative Extension Service, 1988). Using issues to give direction is not a new phenomena, "Issues programming exemplifies the original mission of the Land Grant university to serve the general public in its broadest sense." (Minnesota Cooperative Extension Service, 1988).

Involving the public in identifying research and education issues could generate more support for agriculture and agricultural research. With limited state funding for Agricultural Experiment Stations, CES and Colleges of Agriculture, it is imperative that the public's concerns be integrated with University research agendas. Common themes around the country include public pressure to downsize government spending. Because of their dependence on public money, universities and colleges of agriculture can certainly feel the economic heat. "The downward spiral of state budgets, the current recession, and general constraints on higher education funding in the U.S. have resulted in a substantial loss of research power in the SAESs in the last 4-6 years, estimated to be as much as 20 percent. This loss comes at a time when changing farm programs, increasing international competition, and growing consumer and environmental demands place more pressure on U.S. agriculture now than during any other time in modern history." (ESCOP Planning and Budget Subcommittee, 1991).

An agriculturally illiterate and uninformed public is not likely to comprehend the necessity of agricultural research and improved food production. In this sense, agriculture is part of the entire arena of science, which experiences ever-increasing bouts of trashing from

individuals with science-phobia. These people are not necessarily stupid; on the contrary, they are merely scared: "People...are overwhelmed by a technology from which there is no escape, and they really don't care much for having information stuffed down their throats" (Franklin, 1991). Such feelings suggest that educators must understand consumers very thoroughly before they can educate them with scientific information and logic. Furthermore, public support for additional research in agriculture and science will be impossible until science-phobia is addressed.

Science-phobia is an issue that should be addressed because consumers are affected by it. Consumers see science affecting their lives everyday whether it is a new product on the grocery shelves or a medical breakthrough.

Duke, (1983) stated, "People want to have a say in any action they think has a direct bearing on their lives." Following up on this, it is likely that people would want to have an understanding and positive input on the food and fiber system because it affects their lives on a daily basis. Having consumers identify their issues in regards to the food and fiber system could assist the agricultural industry in becoming proactive to their concerns rather than reactive.

#### Instrument Development Review

There are a variety of research methods that have been used to identify issues that involve a cross-section of the public. These methods include mail questionnaires, telephone surveys, face-to-face interviews, and the Delphi process. According to Dillman (1978), when selecting a research method one must consider four major areas 1) obtaining a representative sample, 2) obtaining answers to all the questions one wants to ask, 3) obtaining accurate answers, and 4) administering the survey. Fortunately, it is possible to obtain representative samples from completely listed populations and achieve high response rates from homogeneous samples for each of these methods.

These methods do differ, however, in other matters.

When using the mail questionnaire respondents are less likely to give answers they think the researcher wants to hear (social desirability bias) and the cost per respondent is low. However, there is low success with open-ended questions, the questionnaire cannot be too long and the complexity must fit the expected respondents' abilities. An example of a study where a mail questionnaire would best fit is if a researcher wanted to survey all Agricultural Education majors who graduated from Michigan State University from 1960 through 1991. Flexibility of the mail questionnaire permits the population to be scattered among the fifty states and foreign countries.

Telephone surveys have high success with open-ended questions, can be done quickly, and have little likelihood of other people helping the respondent with the survey. Disadvantages include the requirement of simple questions and high cost per respondent (depending on geographical area) in comparison to mail surveys. If a researcher needed to complete a study in a two week period of time the telephone survey would be the ideal method to use.

Face-to-face interview advantages include the flexibility of using lengthier questionnaires, the questionnaire can be more complex and more easily handle open-ended questions, the interviewer can encourage the respondent to further respond to a question, and the interviewer may be able to identify evasion, unlike the mail questionnaire where the researcher must assume the respondent is being truthful. However, face-to-face has its distinct disadvantages: cost per respondent is high, social desirability bias is difficult to avoid, and interviewer subversion is a concern. If a researcher wanted to do a study with illiterate respondents the best method would be the face-to-face interview.

The Delphi process is a written group interview technique for eliciting, collating, and generally directing informed judgement towards

a consensus on a particular topic (Delp, et al. 1977). Its advantages include the ability of respondents to generate the original lists of items related to the research problem, it provides anonymity so respondents cannot be dominated by other people as can occur in face-to-face group interviews, social desirability bias can be avoided, individuals who may not take time required for a group meeting may participate, a large heterogeneous group can participate, and like the mail survey, respondents can be geographically scattered. Disadvantages of the Delphi include its lengthiness, since it requires at least six weeks to gather and assimilate responses, it is difficult for people that have difficulty with reading or expressing themselves in writing, and although the Delphi is similar to a verbal group meeting, it lacks the advantage of instant communication.

The Delphi is best used for five different situations 1) establishing goals and their priorities, 2) identifying the dimensions and the attributes of a problem 3) providing forecasts (identifying future developments and their effects), 4) clarifying positions and delineating differences between group members, and 5) gathering information from a group whose members do not meet face-to-face (either by choice or practicality) and wish to retain their anonymity. (Delp, et al., 1977).

The Delphi process was selected for the current study because it allowed respondents to identify their own issues, unlike a typical mail questionnaire where the questions are selected by the researcher. Also, because the Delphi is used to come to a consensus on (an) issue(s), the sample required is smaller. Martino (1972) (as cited in Heath, Neimeyer, and Pedersen, 1988) indicated that a cross-section of 15 experts in a given field is a sufficient number of participants for reliable results. Furthermore, the Delphi technique generates useful information for further research, "the best available forecasting tool" (Heath, et al. 1988).

The Delphi technique has been recently used successfully by Elliot and O'Connell (1990) to identify FFA Issues in Michigan. Issues that agriscience educators thought were important for continued use and implementation in the new agriscience and natural resources curriculum were identified. Our research methods followed the format of this study since it exemplified procedures of a properly conducted Delphi.

The Delphi technique was useful in achieving the purpose of the study, to identify the concerns of Michigan people as they relate to the environment, food production and consumption, the use of Michigan land (forests, state parks, shorelines, etc.), pollution, and international food trade. This study uses two Delphis, comparisons will be made between the consumers and agriculturalists to see if consumers and agriculturalists agree on what issues are of importance.



## CHAPTER III

### METHODOLOGY

This chapter describes the survey procedures and research methods used in this study. The following specific topics are described:

(a) population, (b) sample selection, (c) instrumentation, (d) data collection, and (e) data analysis.

#### Population

The population for the study was the people of Michigan as identified by Survey Sampling, Incorporated of Fairfield, Connecticut. This company was recommended by the Michigan State University Center for Survey Research (CSR). However, there were concerns about the list used. There were eight non-deliverables, several disconnected telephone numbers, and ten names on the list were deceased people (due mainly to women keeping their husbands' names in the telephone directory). Furthermore, due to age five respondents chose not to participate when contacted by phone after the initial postcard was not returned.

#### Sample Selection

Survey Sampling, Incorporated randomly selected three-hundred (300) Michigan residents. From this population the researcher systematically randomly selected 150 people. Systematic random sampling is when all members in the defined population are placed on a list for random selection, and e.g., every sixth person chosen after a random starting place is selected (Ary, et al., 1990). The sample was again systematically randomized to determine the sample for each of the Delphis.

Seventeen (17) Michigan residents agreed to participate in the three-stage Delphi. Of that seventeen, fourteen (14) respondents were consistently returned their questionnaires.

Twenty-three (23) Michigan residents agreed to participate in the

four-stage Delphi. Of that 23, 19 respondents consistently returned their completed questionnaires.

Fifteen (15) respondents were determined to be sufficient for reliable results by Martino (cited in Heath, et al., 1988). However, thirty (30) respondents was determined to be sufficient by Delbecq, et al. (cited in Delp, et al. 1977).

#### Instrumentation

Two Delphis were conducted, a three-stage and four-stage. The three-stage Delphi participants were presented twenty top issues as identified from current literature. The issues in the current literature were listed and tabulated to identify issues that were identified most often by the various agricultural groups. The four-stage Delphi participants identified their own twenty top concerns (Table 5). Utilization of two Delphis allowed comparison of the issues identified by consumers versus issues identified from research, which has previously not included consumers.

The first questionnaire for the three-stage (research-identified) Michigan Issues Delphi was developed using research articles related to consumer issues. The first questionnaire for the four-stage (consumer-identified) Michigan Issues Delphi study was developed by following the recommended Delphi procedure (Delp, et al. 1977). In the four-stage Delphi study the first questionnaire used an open-ended statement to generate a list of issues. This first step is recommended because it allows participants time to think and reflect, and avoids undue focusing on particular ideas. The questionnaires that followed (numbers two, three and four) were developed by grouping like-responses from the prior questionnaire (Table 5). The goal was for the respondents to come to a consensus on the twenty issues.

A Likert-type questionnaire design was used in questionnaires one and two (three-stage, research-identified) and questionnaires two and

three (four-stage, consumer-identified) that measured respondents' opinions towards Michigan consumer issues. For questionnaire number one (three-stage) and number two (four-stage) the respondents' rating indicated the degree of importance they gave an issue. For questionnaire number two (three-stage) and number three (four-stage) the respondents' rating indicated the level of agreement they had for the issue. As the study progressed, the final questionnaire (questionnaire number three or four) was a dichotomous disagree/agree instrument (Table 5).

The Chair of the University Committee on Research Involving Human Subjects (UCRIHS) at Michigan State University received the UCRIHS application, explanatory letter, acceptance postcard, cover letter for the first questionnaires, the first questionnaires for the three stage and four stage Delphis. Approval was required because human subjects were involved in the research (Appendix B).

#### Data Collection

Mail questionnaires were used to collect data. The explanatory letter explained the Delphi process, indicated the importance of the data, assured confidentiality, requested participation, included a stamped postcard for acceptance or non-acceptance, and offered a summary of results upon request. It is crucial that the letters and questionnaires be well prepared because there is no individual contact with the Delphi technique (Delbecq, et al., 1975).

A number coded questionnaire along with a cover letter and self-addressed stamped envelope were mailed during the spring of 1992 to the Delphi sample groups (Appendix D and E). Telephone follow-ups (dunning) were made to non-respondents. Two or three more questionnaires were mailed to the three-stage and four-stage participants, respectively. The mailing dates for the second, third and fourth questionnaires followed a typical Delphi timeline (47 day process) (Table 6).

### Data Analysis

Each questionnaire required different analyses. Questionnaire number one for the four-stage Delphi was analyzed by sorting responses by issues. Like-issues were grouped. The issues having the largest number of responses constituted the list of issues for questionnaire number two. (Appendix B has the complete list of issues).

Questionnaire number one (three-stage) and number two (four-stage) were analyzed by using descriptive statistics. This questionnaire consisted of twenty issues. Each issue was ranked by the respondents on a four-point Likert scale. The four points were identified as 1 = not important, 2 = low importance, 3 = very important, and 4 = extremely important. The mean importance ranking was determined using SPSS/PC+. Using the mean, the issues were ranked by importance for questionnaire number two (three-stage) and questionnaire number three (four stage). From the comments made by respondents the issue statements were generated for questionnaire number two (three-stage) or number three (four-stage).

Questionnaire number two (three-stage) and number three (four-stage) were analyzed using descriptive statistics. Each issue statement was ranked by the respondents on a four-point Likert scale. The four points were identified as 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree. The level of agreement mean was determined using SPSS/PC+.

Questionnaire number three (three-stage) and number four (four-stage) were designed to have respondents come to consensus on the issue statements. The issue statements were presented on a dichotomous scale, the respondents either disagreed or agreed with the statement. Frequencies were the descriptive statistics used for this questionnaire.

Specific questionnaire analyses is discussed in Chapter IV, Results of the Data Analysis. Complete data analyses is presented in Appendix F and G.

Summary

The three and four-stage Delphis had twenty issues to prioritize. The four stage Delphi included the following steps: 1) identify the issues, 2) determine the importance of each issue, 3) determine the level of agreement on each issue statement, and 4) confirm the level of agreement on each issue statement.

The three-stage Delphi include the following steps: 1) determine the importance of each issue (issues were identified from review of literature), 2) determine the level of agreement on each issue statement, and 3) confirm the level of agreement on each issue statement. In each Delphi the issues statements were developed from comments made by respondents to the issues.

The results of data analysis are outlined in Chapter IV.

Table 5

Delphi questionnaire descriptions.

Three-stage Delphi (research-identified issues)	Four-stage Delphi (consumer-identified issues)
Issues were identified from the literature	<u>Questionnaire #1</u> Open-ended question: "Please list at least five issues that you think are of concern to the people of Michigan." This was used to generate the list of issues
<u>Questionnaire #1</u> Four-point Likert-scale used to determine importance of twenty issues. Three-stage Delphi had issues identified from current literature. Four-stage issues were identified from Questionnaire #1. Likert scale: 1 = Not important, 2 = Low importance, 3 = Very important, 4 = Extremely important.	
<u>Questionnaire #2</u> Four point Likert scale determining level of agreement on the twenty issues. The issues were ranked according to importance as determined by the previous questionnaire. Likert scale: 1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree.	
<u>Questionnaire #3</u> Two-point scale (disagree/agree) was used on the same twenty issues to reach consensus	
<u>Questionnaire #2</u> Four-point Likert-scale used to determine importance of twenty issues. Three-stage Delphi had issues identified from current literature. Four-stage issues were identified from Questionnaire #1. Likert scale: 1 = Not important, 2 = Low importance, 3 = Very important, 4 = Extremely important.	
<u>Questionnaire #3</u> Four point Likert scale determining level of agreement on the twenty issues. The issues were ranked according to importance as determined by the previous questionnaire. Likert scale: 1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree.	
<u>Questionnaire #4</u> Two-point scale (disagree/agree) was used on the same twenty issues to reach consensus	

Table 6

Schedule for Michigan Issues Delphi


---

1.	Develop problem statement	March 1
2.	Select respondents	February
3.	Contact respondents	March 5
4.	Develop questionnaire 3-#1, 4-#1 (*)	March 7
5.	Type and send out	April 3
6.	Response time	April 8
7.	Dunning time (if used)	April 9,10
8.	Analysis - questionnaire 3#1, 4-#1	April 13
9.	Develop questionnaire 3-#2, 4-#2	April 14
10.	Type and send out	April 15
11.	Response time	April 22
12.	Dunning time (if used)	April 23, 24
13.	Analysis - questionnaire 3-#2, 4-#2	April 27
14.	Develop questionnaire 3-#3, 4-#3	April 28
15.	Type and send out	April 29
16.	Response time	May 5
17.	Dunning time (if used)	May 6, 7
18.	Analysis questionnaire 3-#3, 4-#3	May 8
19.	Develop Questionnaire 4-#4	May 11
20.	Type and send out	May 12
21.	Response time	May 18
22.	Dunning time	May 19
23.	Analysis of questionnaire 4-#4	May 20
24.	Prepare report 3 and 4	May 21, 22
25.	Type report and send out	May 26

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(\*) 3 = 3-stage Delphi

4 = 4-stage Delphi

## CHAPTER IV

### RESULTS OF THE DATA ANALYSIS

The primary purpose of this study was to identify the concerns of Michigan people as they relate to the environment, food production and consumption, the use of Michigan land (forests, state parks, shorelines, etc.), pollution, and international food trade. The specific objectives included:

1. To identify consumer-type agricultural issues that are of concern to Michigan people.
2. To ascertain differences and similarities between issues identified by consumers and issues identified from research.

The data analysis was based on the responses to the Likert-type questions in each questionnaire of the three-stage and four-stage Delphis. Questionnaire number two consisted of twenty issues and questionnaires three and four consisted of twenty issue statements developed from comments made on questionnaire number two.

The responses to the Likert-type questions were analyzed using descriptive statistics, including frequencies and means.

The results of the study are presented in four sections. The first section is respondent characteristics. The second section is the data analysis for the three-stage Delphi. The third section is the list of issues identified by the four-stage Delphi participants and the data analysis for the three questionnaires. The fourth section gives a side-by-side comparison of the three-stage and four-stage Delphi issues and their importance ranking.

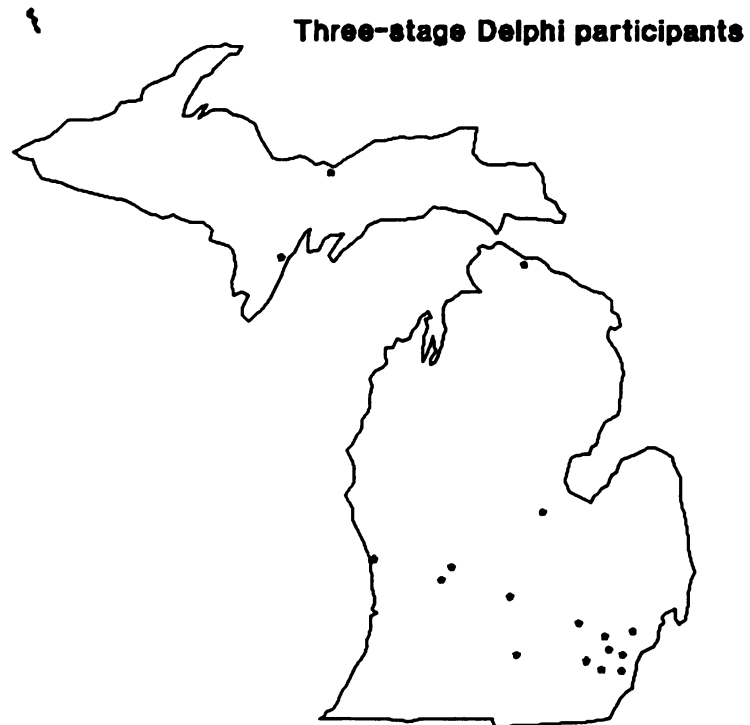


### I. Respondent Characteristics

Respondents were located throughout the state of Michigan. Each Delphi had participants from each region of the state.

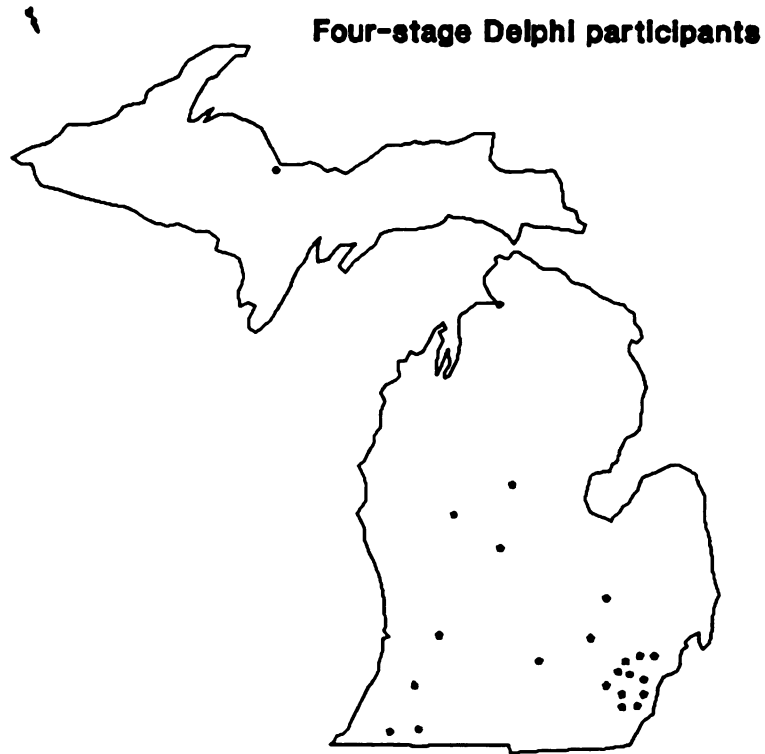
Figure 1

Three-stage Delphi participants' location within state of Michigan.



**Figure 2**

**Four-stage Delphi participants' location within state of Michigan.**



**II. Data Analysis -Three-stage Delphi**

In the three-stage Delphi questionnaire number one respondents were asked to rank how important each issue was by using a four point Likert- scale. For analysis purposes, each response was assigned a corresponding value, 1 through 4. Table 7 is the key for the Likert scale questions in questionnaire number one.

Table 7

Key to Likert scale questions for Three-stage Delphi - Questionnaire #1

KEY		
NI	Not important	1.00 - 1.49
LI	Low importance	1.50 - 2.49
VI	Very Important	2.50 - 3.49
EI	Extremely Important	3.50 - 4.0

The respondents were asked to rank level of importance of each issue (Table 8). They were encouraged to write comments indicating their reason for giving a specific importance level. The means for each issue then was used to give rankings to the issues for questionnaire number 2.

In Questionnaire number one the respondents ranked six issues at low importance and twelve issues as very important and two issues as extremely important. The respondents ranked property taxes and saving farmland as the extremely important issues. (Table 8).

Table 8

Three-stage Delphi: Questionnaire #1 - Importance ranking of issues identified from research.

ISSUE	NI	LI	VI	EI
1. Food safety			3.43	
2. Greenhouse effect			2.64	
3. Clean air			3.29	
4. Groundwater			3.36	
5. Property taxes				3.54
6. Landfills			3.15	
7. Use of MI land			3.38	
8. Acid rain		2.23		
9. Attracting tourists			3.00	
10. Lawn pesticide use			2.57	
11. Agricultural pesticide use			2.86	
12. Organic farming			2.64	
13. Genetic engineering		2.31		
14. International food trade		2.38		
15. Recycling			3.21	
16. Food from producer to your table			2.79	
17. Animal wastes		2.46		
18. Animal rights/welfare		2.29		
19. Saving farmland				3.57
20. Wetlands		2.43		

Respondents had the opportunity to write comments about each issue on the first questionnaire to assist in establishing the issue statement for questionnaire number two. All comments from the three-stage Delphi questionnaire number one were grouped into positive, negative, and neutral categories (Tables 9 - 28)

Table 9

Written comments by respondents to the issue "Food safety" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	1	11
Negative	5	56
Neutral	3	33
TOTALS	9	100.0

#### Positive

I see no safety problems with food.

#### Negative

Use of too much preservatives.

Seafood and poultry marketing problems are possible exceptions.

Too many chemical grown foods, nothing is good to eat anymore, foods are making people ill.

Safety of our food affects us all- example - there is a problem when we are not to eat fish from Lake Michigan.

If foods are not kept at high standards, disease follows.

#### Neutral

A basic requirement for our people - should be a "given."

Should be some regulation. Keep state government out.

Safe food is important because it affects all people.

Table 10

Written comments by respondents to the issue "Greenhouse effect" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	1	13
Negative	4	50
Neutral	3	37
TOTALS	8	100.0

Positive

The key to protecting our whole environment is protecting the ozone layer.

Negative

I don't believe in it.

An "over-hyped" issue, being addressed (as it needs to be) at international level.

Still not sure how much effect it has on world?

The foods are grown too fast this question reverts to the first question.

Neutral

Important today primary at the research level.

Don't really know if this is a problem! Needs more study.

Should be handled on a national basis.

Table 11

Written comments by respondents to the issue "Clean air" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	2	22
Negative	3	33
Neutral	4	45
TOTALS	9	100.0

Positive

Existing programs largely adequate.

Cleaning the air is part of protecting the ozone layer.

**Negative**

There is too much regulation.

For our health we need clean air, too much pollution.

Choking on foul smells.

**Neutral**

Depends on many factors beyond state - MI must do its part to legislate and enforce.

Need more checks and balances.

Common sense tells us we need to work on maintaining clean air.

Should be handled on a national basis. All states should have California standards for cars.

Table 12

Written comments by respondents to the issue "Groundwater" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	0	0
Negative	3	33
Neutral	6	67
TOTALS	9	100.0

**Negative**

Polluted.

Existing programs based on sparce [sic] data and low understanding of risks.

Too many instances of wells being contaminated. Too much fertilizing.

**Neutral**

I don't know much about the problem.

Essential for beautiful growth as long as it is not contaminated.

Not enough known - a potentially huge issue. Analysis of private drinking water wells for contaminants should be mandatory.

Contaminated groundwater should be the responsibility of the polluter.

Need more checks and balances.

Important because it can affect people without their knowing it.

Table 13

Written comments by respondents to the issue "Property taxes" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	0	0
Negative	5	55
Neutral	4	45
TOTALS	9	100.0

Negative

They are too high can't afford. Keep going up each year.

Could be lower.

Too high added to all other taxes.

There must be limits set - local taxing authorities too independent. Increases in state equalized values must be balanced by total property tax base growth.

Taxes should be spent more wisely.

Neutral

Should be replaced by state income tax increase so every one who works would pay.

Instead of raising property taxes, budgets should be cut.

We need property taxes to maintain schools - but let's stop waste.

No opinion.

Table 14

Written comments by respondents to the issue "Landfills" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	1	13
Negative	4	50
Neutral	3	37
TOTALS	8	100.0

Positive

Have been in state for years.



**Negative**

Some problem areas, but important largely in political context - lack of public understanding and support for national program development.

Incinerate all waste and stop damaging rich lands.

Relate to groundwater issue.

We need to find other ways to dispose with waster materials.

**Neutral**

Landfills are necessary, but I would like to see more incinerators that are environmentally safe.

Need more checks and balances.

Need close regulation now.

Table 15

Written comments by respondents to the issue "Use of Michigan land..." grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	3	37
Negative	4	50
Neutral	1	13
TOTALS	8	100.0

**Positive**

I like to use them to get away from the fast pace of life.

These areas should be kept as they are - we now have plenty of condos, golf courses, etc.

Important to maintain these natural sites of beauty for natives and tourists.

**Negative**

MI does not keep parks up. Too much regulation.

Problems with private land development more than public management.

Should be open to all and not a few with sufficient supervision.

Overuse and irresponsible use by ATV's etc. Should be better policed, access limited.

**Neutral**

I have no complaints.

Table 16

Written comments by respondents to the issue "Acid rain" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	4	50
Negative	0	0
Neutral	4	50
TOTALS	8	100.0

Positive

Always been acid rain, again too much regulation.

Existing programs largely adequate.

I don't see that this is a problem in Michigan.

Not sure if it isn't just a natural occurrence, need more education on it.

Neutral

Clean air and protecting the ozone will help acid rain also.

Don't know enough about it.

Similar to clean air.

Still not sure how much affect it has on the world.

Table 17

Written comments by respondents to the issue "Attracting tourists" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	4	45
Negative	5	55
Neutral	0	0
TOTALS	9	100.0

Positive

As industry declines tourism may be our best source of revenue.

Helps keep business alive, also brings tax money to state in form of sales tax.

We need to advertise more in other states - we have much to offer.  
Need their added revenue since manufacturing base is being eroded.

#### Negative

MI has very few things to offer tourists except fishing, hunting and boating.

Cost too much.

Issue more a problem of excessive tourist activity in sensitive areas.

The middle class people do not get to enjoy profits from it.

State needs strong input to economy from outside - our infrastructure for supporting more tourist trade seems to be diminishing (roads, rec land).

Table 18

Written comments by respondents to the issue "Lawn pesticide use" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	3	33
Negative	3	33
Neutral	3	33
TOTALS	9	100.0

#### Positive

Need something to take care of moles.

Relatively small problem - should lawn/tree service companies be more accountable to owners.

Not perceived to be a problem.

#### Negative

Use what I want.

Not good, but what can you do if you want a beautiful lawn the land is so stripped of all nutrients.

We are sacrificing our groundwater for beauty of lawns - need more regulations.

#### Neutral

This is a control issue, much broader than just pesticides.

Pesticides should be environmentally safe.

Needs checks and balances.

Table 19

Written comments by respondents to the issue "Agricultural pesticide use" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	2	25
Negative	4	50
Neutral	2	25
TOTALS	8	100.0

Positive

Been used for years no effect on humans.

Not perceived to be a problem.

Negative

I think we're using it too much.

Killing animals as well as people.

Pesticide residuals should be tracked for their flow/entry into food/plant chain, groundwater, etc.

We are sacrificing our groundwater - need more regulations.

Neutral

Much progress has been made, but changing conditions will keep it as important issue.

Also should be environmentally safe.

Table 20

Written comments by respondents to the issue "Organic farming" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	2	25
Negative	1	12
Neutral	5	63
TOTALS	8	100.0

Positive

Lovely, the food tastes better and is much better for you.

A good alternative to pesticide use.

Negative

If this is an issue at all, it is because there is not a common understanding of what it is.

Neutral

Not applicable.

Development as alternative means of farming should be encouraged - Can it be productive?

Works fine on a small scale.

Needs more study - hard to do on a large scale.

It should be investigated to make it economical.

Table 21

Written comments by respondents to the issue "Genetic engineering" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	3	37
Negative	1	13
Neutral	4	50
TOTALS	8	100.0

Positive

Similar to organic farming important to develop better, more resistant, more nutritious, more productive strains.

Great if it helps agriculture or medicine

More

Negative

Don't fool with nature

Neutral

Do not know enough about subject.

One of those issues that will take much time, and it is important that solutions not be rushed - nor denied.

Don't know enough about it.

I am not clear on this issue.

Table 22

Written comments by respondents to the issue "International food trade" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	3	43
Negative	0	0
Neutral	4	57
TOTALS	7	100.0

Positive

Can be important to economy; need to develop better marketing programs.

Good idea if more countries had a food surplus.

We need to work on improving restrictions on imports and exports.

Neutral

I believe in free trade.

Only in the sense that all trading systems can be improved to lower costs and improve efficiencies.

Take care here first to feed hungry people. Then international trade is fine.

Give our surpluses to starving countries.

Table 23

Written comments by respondents to the issue "Recycling" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	8	89
Negative	1	11
Neutral	0	0
TOTALS	9	100.0

Positive

Good ideas, a savings and wouldn't be filling all our landfills that already full.

Important not only to do it, but to do it only where it makes sense.

Fine, then maybe the condition of the land will get better so gardens, lawns and plants will grow better.

Benefits everyone; should have more mandatory programs.

Very necessary since landfills are filling up.

A good way to clean environment and start new business and re-use products over again.

I think Michigan is doing a better job than most states.

It should start now. Statewide standards should be set.

#### Negative

Do not like it.

Table 24

Written comments by respondents to the issue "Understanding how food moves from producer to your table" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	3	37
Negative	1	13
Neutral	4	50
TOTALS	8	100.0

#### Positive

Would like to know but have to keep government out of it.

We need to know what all is done to food before we get it.

Can't hurt.

#### Negative

It does not move fast enough it's been stored up for so long when you get it it rots after a few hours.

#### Neutral

How it does is much less important than the fact that it does reliably and safely.

No complaints.

I feel our schools do a good job on this issue.

Regulations should guide the public sector.

Table 25

Written comments by respondents to the issue "Disposal of animal wastes as it relates to food production" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	1	12
Negative	2	25
Neutral	5	63
TOTALS	8	100.0

Positive

Animal wastes has been used for years for fertilizer to grow feed for animals.

Negative

Years ago we used manure, but now it's full of pesticides, too, because of the food they eat.

Find some way to dispose of it so it will not come in contact with food.

Neutral

Issue related to food processing would seem to be more important than on farm.

Under proper health and safety codes, shouldn't be an issue.

I am unfamiliar with this issue.

No opinion.

Could be used as natural fertilizer as is done in Europe.

Table 26

Written comments by respondents to the issue "Animal rights/welfare" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	4	50
Negative	1	13
Neutral	3	37
TOTALS	8	100.0

Positive

People are more important than animals.



Another "over-hyped" issue; animals are to be respected, but they are still subservient to man.

We need to stress human rights over animal rights.

Let's worry about human rights.

#### Negative

They have just as much rights as people.

#### Neutral

Proliferation and inadequate care of pets more a problem than agricultural or research use.

Be kind to animals if you take care of them as you wish to be taken care of.

OK if not overdone. Necessary.

Table 27

Written comments by respondents to the issue "Saving farmland" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	4	45
Negative	2	22
Neutral	3	33
TOTALS	9	100.0

#### Positive

We need farmland for food.

Good insurance as well as good stewardship.

To have food you must have farmland.

Help the farmer to make farming profitable.

#### Negative

Taxes and builders are forcing farmers out of business.

Put all farmland in use and there will be no hungry people, instead of paying farmers not to farm.

#### Neutral

Making existing land more productive is just as important.

Without farmland cannot feed people but should be left to small farmer.

As of now we produce all we need - but we must think of the future.

Table 28

Written comments by respondents to the issue "Wetlands" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	3	38
Negative	3	38
Neutral	2	25
TOTALS	8	100.0

Positive

Needed for the survival of many wildlife.

We need a place to clean water for use in food production and drinking.

They must continue to be protected and preserved.

Negative

Do not believe in wetlands to save animals. Too many regulations. Do not like animal rights people or save the earthers.

Still another "over-hyped" issue; need some common sense in application of defining and regulating wetlands.

Use common sense in declaring wetlands. Wetlands in the middle of city doesn't make sense.

Neutral

Some people still aren't convinced of the value of wetlands, but spurious definitions have damaged credibility of preservation efforts.

Don't know enough about it.

In the three-stage Delphi questionnaire number two respondents were asked to rank the level of agreement for each issue by using a four point Likert- scale. For analysis purposes, each response was assigned a corresponding value, 1 through 4. Table 29 is the key for the Likert scale questions in questionnaire number two.

Table 29

Key to Likert scale questions Three-stage Delphi - Questionnaire #2

KEY		
SD	Strongly disagree	1.00 - 1.49
D	Disagree	1.50 - 2.49
A	Agree	2.50 - 3.49
SA	Strongly agree	3.50 - 4.0

Table 30 identifies the agreement participants had toward each issues. The issues are listed in importance order as determined by questionnaire number one.

The only statement respondents strongly agreed with was that farmland needed to be preserved. The respondents disagreed with the statements made about the "Greenhouse Effect", animal waste usage, and acid rain. Due to their comments on the "Greenhouse Effect," acid rain, and organic farming the questions were reworded for the final questionnaire.

Table 30

Three-stage Delphi: Questionnaire #2 - Levels of Agreement

Issue Statement	SD	D	A	SA
1.*** Farmland must be preserved now and in the future.				3.64
2.*** Property tax reform should be introduced			3.42	
3.** Food safety should be improved even if it means higher food prices.			2.93	
4.** It is important to maintain Michigan lands as natural sites of beauty for MI natives and tourists.			3.29	
5.** Groundwater quality may be a more serious problem than currently believed because of insufficient knowledge.			3.23	
6.** Michigan should increase air quality through government regulation.			2.79	
7.** Recycling programs within MI should be more uniform.			3.21	
8.** Michigan should research possible permanent alternatives to landfills.			3.43	
9.** Michigan needs to increase efforts to promote tourism.			2.86	
10.** Michigan farmers should decrease their use of pesticides.			2.79	
11.** Educational programs should be created to inform consumers about how food is produced.			2.57	
^12.**Organic farming is difficult to do on a large scale.			2.5	
^13.**The "Greenhouse Effect" is an overblown issue.		2.36		
14.** Lawn owners should decrease their use of pesticides/fertilizers.			3.00	
15.* Animal wastes should be used only on crops grown for animal consumption.		2.08		
16.* Wetlands need to be protected and preserved because they are needed for the survival of wildlife.			3.07	

Table 30 continued

Three-stage Delphi: Questionnaire #2 - Levels of Agreement

Issue Statement	SD	D	A	SA
17.* International food trade is important to all nations' economies.			2.79	
18.* People need to be better informed about genetic engineering.			3.08	
19.* Animals need to be respected however, we need to stress human rights over animal rights.			3.38	
^20.* Acid rain is not a problem in MI.		1.77		

^Questions 13, 14, and 20 were reworded for Questionnaire number three due to comments made on Questionnaire number two.

\*\*\* = Extremely important issue

\*\* = Very important issue

\* = Low importance issue

Respondents had the opportunity to add comments to each issue statement to clarify their position. Comments were grouped into agree, disagree, and neutral categories. The following lists are the comments made by respondents to each issue statement on questionnaire number two.

1. Farmland must be preserved in order to have food now and in the future.

Agree

All open land and less urban sprawl.

Farmers must be left alone by local and State government. He should be able to farm his land or sell if he wants.

All lands must be preserved for the future.

Developers must be controlled. The tax structures, transportation systems, etc. that promote this "chew it up - spit it out- leave it behind" process must change now.

2.

Agree

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2. Recycling programs within Michigan should be more uniform.

Agree

And research new uses of recyclables.

I think we don't have enough recycling drop-offs in Michigan.

Recycling must become a way of life and can become a major industry for us if we can get politicians to stop promoting big budget incinerators.

Disagree

Recycling programs are not working now costing more than backers thought it would.

Uniformity doesn't seem to be a relevant goal, although more recycling should be done.

Neutral

Individual communities may have unique problems/situations - recycling most effective on a local basis and should have local citizen support.

3. Michigan should increase air quality through government regulation.

Agree

This is important but it should be done on a federal level for uniformity.

Although the need for many new regulations is questionable.

Disagree

No more government regulations. They waste too much tax payers money.

It is not the function of government to protect the profits or interest of commercial entities at the expense of poisoning the private citizen.

National/EPA issue.

Neutral

It would be better if air quality was everybody's responsibility voluntarily.

It is the function of business to adapt.

4. Groundwater quality may be a more serious problem than currently believed because of insufficient knowledge.

Agree

Insufficient knowledge - you are right.

We must devote more of society's financial resource to understanding ecosystems and environmental consequences.

**Neutral**

I've only heard of a few isolated instances.

It may be better also.

5. Michigan should research possible permanent alternatives to landfills.

**Agree**

Someway to totally get rid of the mess.

Do we know just what is landfills doing to our lands.

Although, I'm not sure "Michigan" is the proper agency or what is meant by permanent.

With almost lifestyle change, 95% of all products can be recycled or composted. Recycling businesses located in MI can employ many skilled and unskilled workers. Recycling waste products are much more easily dealt with (one at a time) than the mixture produced by incinerators.

**Disagree**

I am sorry I cannot trust members of government to research alternatives fairly. They would be out for personal gain.

6. Food safety should be improved even if it means higher food prices.

**Disagree**

Food is safe now.

We have the highest food quality in the world now.

I think our food is safe not too much improvement needed.

**Neutral**

Food safety is extremely important but the price should be reasonable for everyone.

How this is approached is critical. LISA and IPM programs must be promoted and enforced through reward and penalty systems.... However....[sic]

Food safety is already quite high; are additional costs really warranted?

7. Property tax reform measures should be introduced.

**Agree**

Agree but property tax reform does not mean increased taxes, but tax dollars are more wisely spent.



Tax should be entirely on wages for schools so all who work pay.

Too much money is wasted.

People are being forced out of their homes now because of high property taxes.

Tax structures need to be changed so that private citizens and small businesses are not sacrificed to the interests of big business. Farmers should not struggle while food-processing conglomerates have stock-splits.

Neutral

I don't understand enough about taxes to answer.

No opinion.

8. Michigan farmers should decrease their use of pesticides.

Agree

Harmful pesticides.

We should be able to find other ways than pesticides.

Other means should be used regularly to avoid these problems.

And consumers must be re-taught that an occasional worm in sweet corn is OK and that tomatoes and apples do not get better because they're "picture perfect." This is only fantasy as long as (Department of Agriculture personnel control the MDA for the benefit of chemical companies).

Disagree

Again more government intervention.

Neutral

Quantity alone is not the relevant measure.

9. Michigan needs to increase efforts to promote tourism.

Agree

As industry decreases as a source of revenue it must be picked up somewhere.

Michigan has to clean up state to get more tourism. Michigan should look at other states that increased tourism without raising taxes.

Disagree

But not if it includes the use of recreational ORV's.

**Neutral**

Michigan has more than its share of tourism we need to keep up what we have.

Tourism is important but the year round residents need employment first.

10. Lawn owners should decrease their use of pesticides/fertilizers.

**Agree**

If harmful

The average property owner is probably ill-informed and careless in use - most of which is for questionable aesthetic purposes.

Alternatives should be more available through education, and price.

**Disagree**

Why should I. Give me proof.

This should not be accomplished through regulation aimed at consumers - except for very strict public notice posting requirements.

**Neutral**

Most lawns should not need a great deal of pesticides.

11. It is important to maintain Michigan lands (forests, state parks, shorelines, etc.) as natural sites of beauty for Michigan natives and tourists.

**Agree**

For the sake of our childrens' children and for Michigan.

I am a Chippewa Indian I feel all lands should be kept natural.

And, more importantly, as sites for educating the general public about the environment.

**Disagree**

MI has had a chance for years to do this. They seem to never finish what they start. Funnel money to other projects.

12. Wetlands need to be protected and preserved because they are needed for the survival of wildlife.

**Agree**

And other reasons.

Duck populations are down by 33% over the last 20 years because of

developmental destruction of wetlands - and the NRA has no comment. Why?

As it applies to true, natural wildlife habitat wetland, not wetlands as currently defined by DNR.

Disagree

Wildlife do not need all of the wetlands to survive. Some do more damage to the land than people think.

I feel that DNR goes overboard with wetlands.

We do not need another Chegon owl situation.

13. Educational programs should be created to inform consumers about how food is produced.

Agree

I agree we need to know what goes into our food and bodies.

We operate a roadside market and are shocked, amazed and very worried at how far out of touch most consumers are. Many seem to believe that food is somehow manufactured like automobiles or tupperware.

Disagree

Not necessary.

Another program that does not produce anything.

I'm sure most people know- Our schools do a good job here.

Neutral

Quality, safe food at a reasonable price is what consumers want.

14. The greenhouse effect is an overblown issue.

Agree

I do not believe in the Greenhouse effect.

Greenhouse effect is not an issue, the issues have to do with antropogenic [sic] contributions and proposed mitigation/control measures.

Disagree

Everything living depends on a balance.

No! But we do need to know more about it.

Its [sic] a noticeable problem that needs additional education.

Only if you are a rich, old, white male.

15. International food trade is important to all nations' economies.

Agree

They'll most likely import it if they don't export it.

If it is fair trade to U.S.

Probably "most" nations' economies.

Some foods aren't grown in all countries with the quality that is marketable.

If we do not seize the opportunity offered by current negotiations of GATT and NAFTA to help developing nations clean their environments, improve their workers conditions and their general standard of living - we will very shortly lose ours.

Disagree

I feel the USA -it is time to tend to our people and keep our trade as little as we need, until we are the land of the free once again.

Neutral

Not necessarily important to all nations, depending on their particular supply/demand balance.

16. Animal wastes should be used only on crops grown for animal consumption.

Disagree

Animal waste is not harmful as fertilizer.

Is used now.

To my knowledge it doesn't do a great deal of harm.

Neutral

More information needed on this question.

Animal wastes must be used with as much knowledge and caution as any fertilizer.

17. Acid rain is not a problem in Michigan.

Agree

Not a high priority problem.

Disagree

Yes, this is worldwide no state is problem free.

If it is a problem for our neighbors in Ontario, New York, etc. (and it definitely is) and we produce it (and we do), then it is our problem.

**Neutral**

Don't know if it is or isn't.

N.A. Do [sic] not bother me.

Substantial control efforts already in place, but monitoring should continue.

Not sure don't read to [sic] much about acid rain in Michigan.

18. Organic farming is difficult to do on a large scale.

**Agree**

I would agree but know of no studies.

**Disagree**

It is done in other countries.

Expensive but not difficult

For most of the 20th century companies producing pesticides and fertilizers have vastly outspent other agencies in assisting farmers in many ways to get them accustomed to a chemical-based production system. Until LISA programs receive equal amount of support, most people will continue to believe that large scale organic farming is not only difficult, but impossible. And with (certain politicians and Department of Agriculture personnel) working on behalf of the chemical companies so diligently....

**Neutral**

Farmers have used organic farming for years. They should be able to use both organic and pesticides.

I have no answer.

No opinion.

19. Animals need to be respected, however, we need to stress human rights over animal rights.

**Agree**

God put animals on earth for peoples use.

As long as animal species aren't eradicated but kept in balance.

Animals should not be treated badly, but they should not interfere with human rights.

This is true, humans should come first.

I do not believe in "Animal Rights," but I do brake for animals. It is impossible to legislate against brutality and against destruction of habitat. If we do not, soon, make a virtual religion out of living in spiritual and physical harmony with other animal species (which does not

mean we can't eat them), we are doomed.

Neutral

Please elaborate.

20. People need to be better informed about genetic engineering.

Agree

People aren't aware of what it is or how it could be used.

Me too, but TV news, The Free Press, WJR & Detroit News, Time, Newsweek, etc. aren't going to help much are they? (underlines were not included).

Neutral

Most people would not understand if so informed.

Do not know enough about it. Studies should be done about it.

I know nothing about this.

The majority of people don't understand how it works.

Questionnaire number three was designed to confirm the level of agreement on each issue and to have the group come to a consensus on the level of agreement for each issue statement. Table 31 lists the number of respondents who disagreed with the statement and the number that agreed with the statement. It also includes the percentage of respondents that disagreed or agreed.

Issue statements on farmland preservation, maintaining Michigan lands as natural sites of beauty, and stressing human rights before animal rights received the highest levels of agreement. Statements concerning government regulation of air quality, educational programs concerning how food moves from the producer to the consumer, organic farming on a large scale, and animal waste usage received low levels of agreement.

Table 31

Three-stage Delphi: Questionnaire #3 - Level of Agreement Confirmed

Issue Statement	Disagree (N)	%	Agree (N)	%
1.*** Farmland must be preserved now and in the future.	1	7.1	13	92.9
2.*** Property tax reform should be introduced	1	9.1	10	90.9
3.** Food safety should be improved even if it means higher food prices.	7	50.0	7	50.0
4.** It is important to maintain Michigan lands as natural sites of beauty for MI natives and tourists.	1	7.1	13	92.9
5.** Groundwater quality may be a more serious problem than currently believed because of insufficient knowledge.	3	21.4	11	78.6
6.** Michigan should increase air quality through government regulation.	9	64.3	5	35.7
7.** Recycling programs within MI should be more uniform.	3	21.4	11	78.6
8.** Michigan should research possible permanent alternatives to landfills.	3	21.4	11	78.6
9.** Michigan needs to increase efforts to promote tourism.	3	21.4	11	78.6
10.** Michigan farmers should decrease their use of pesticides.	3	21.4	11	78.6
11.** Educational programs should be created to inform consumers about how food is produced.	10	76.9	3	23.1
12.** Organic farming could be accomplished on a large scale.	7	53.8	6	46.2
13.** The "Greenhouse Effect" is an issue of concern in Michigan.	7	50.0	7	50.0
14.** Lawn owners should decrease their use of pesticides/fertilizers.	4	28.6	10	71.4

Table 31 continued

Three-stage Delphi: Questionnaire #3 - Level of Agreement Confirmed

Issue Statement	Disagree (N)	%	Agree (N)	%
15.* Animal wastes should be used only on crops grown for animal consumption.	9	69.2	4	30.8
16.* Wetlands need to be protected and preserved because they are needed for the survival of wildlife.	2	15.4	11	84.6
17.* International food trade is important to all nations' economies.	3	21.4	11	78.6
18.* People need to be better informed about genetic engineering.	4	28.6	10	71.4
19.* Animals need to be respected however, we need to stress human rights over animal rights.	1	7.1	13	92.9
20.* Acid rain is a concern in Michigan.	6	42.9	8	57.1

\*\*\* = Extremely important issue

\*\* = Very important issue

\* = Low importance issue

On questionnaire number three respondents were instructed to add a comment to clarify their responses if needed. By this stage most respondents had come to a decision as to whether they agreed or disagreed with each issue statement, they were aware that further discussion would not be used in another questionnaire. Comments are grouped into agree, disagree, neutral categories.

1. Farmland must be preserved in order to have food now and in the future.

Agree

Just where would our grown food come from without farmland?

You must get back to farming and eliminate [sic] hothouse grown foods.

Neutral

Unless productivity outpaces consumption.

Hard question no new regulation from state gov.



**2. Property tax reform should be introduced.**

**Agree**

Reform does not mean increased taxes.

**Neutral**

No opinion.

Taxpayers should have a [sic] input on how they are taxed and how money is spent.

Not sure.

**3. Food safety should be improved even if it means higher food prices.**

**Disagree**

Stop using chemicals to grow foods. It may reduce the costs.

**Neutral**

Do not see it as a major problem.

There is enough regulations now to cover food safety.

Our foods are fairly safe except for our meats.

Food is safe now.

**4. It is important to maintain Michigan lands (forests, state parks, shorelines, etc.) as natural sites of beauty for Michigan natives and tourists.**

**Agree**

Very important not just for tourists and beauty but someday we may be damn glad to have clean water and land.

Not only that it will help to reduce the foul air people are breathing.

**Disagree**

The state isn't doing a very good job now. No new taxes.

**5. Groundwater quality may be a more serious problem than currently believed because of insufficient knowledge.**

**Agree**

To [sic] many chemicals are used on the grass and waste matter is not disposed of right.

6. Michigan should increase air quality through government regulation.

Disagree

Never.

Not much government can do with polution [sic] from cars and other sources

Neutral

Should be done on a federal level.

7. Recycling programs within Michigan should be more uniform.

Agree

Yes.

Disagree

Not really saving anything by recycling. Cost to [sic] much money now.

8. Michigan should research possible permanent alternatives to landfills.

Agree

Not Mich. private companies should be given free hand to research.

Certainly.

9. Michigan needs to increase efforts to promote tourism.

Agree

Along with keeping the resident working.

Neutral

First try some way to delete crime first, then other nice activities will follow.

10. Michigan farmers should decrease their use of pesticides.

Agree

Certainly foods are unsafe to consume on account of pesticides

11. Educational programs should be created to inform consumers about how food is produced.

Agree

It would be a great help, then you would know what's good or bad for you.

12. Organic farming could be accomplished on a large scale.

Agree

Sure get rid of all chemicals and pesticides - that's the way it used to be.

Neutral

Not aware alot [sic] about organic farming.

13. The "Greenhouse Effect" is an issue of concern in Michigan.

Agree

If the GHE is true all states need to be in concern.

Neutral

That should be only for flowers and things of that nature.

14. Lawn owners should decrease their use of pesticides/fertilizers.

Agree

True what goes into the earth, has to sooner come out.

Unless its organic

Neutral

Government is regulating pesticides and fertilizers now.

15. Animal wastes should be used only on crops grown for animal consumption.

Disagree

Farmers have been doing that for years.

16. Wetlands need to be protected and preserved because they are needed for the survival of wildlife.

Disagree

To [sic] many regulations now.

I think some wetlands are mosquito havens and we are pushing wetlands more than we need.

17. International food trade is important to all nations' economies.

Agree

I agree just so far we here in the U.S. must start taking care our own and caring for what is here not all other country's [sic].

18. People need to be better informed about genetic engineering.

Neutral

I do not know enough.

19. Animals need to be respected, however, we need to stress human rights over animal rights.

Agree

I do not believe in animal rights groups.

You bet.

This is definetly [sic] a concern, kill your neighbor no problem but hang if you shot a moose!

20. Acid rain is a concern in Michigan.

Disagree

Over stated.

Neutral

I [sic] not sure we have a big worry.

Lack of knowledge on this issue.

### III. Descriptive Statistics - Four-stage Delphi

Questionnaire number one for the four-stage Delphi was an open-ended question used by the respondents to list the issues they felt faced the Michigan consumer. The results from questionnaire number one are found in Table 32. A complete list of issues is included in the Appendices. The researcher had to make final judgements on certain issues that only received one nomination to keep the issue list to twenty issues.

Water pollution and drinking water were made two separate issues

due to the comments made on questionnaire number one. There are ten (10) issues; food safety, air pollution, drinking water/groundwater, property taxes, landfills, use of Michigan land, agricultural chemical (pesticide) use, recycling, saving farmland, and wetlands that are similar to those identified from research for the three-stage Delphi.

Table 32

Issues Identified in Four-stage Delphi - Questionnaire #1

Number	Issue Identified
12	Water pollution
8	Food safety
7	Landfills
6	Air pollution
5	Michigan economy
4	Drinking water
4	Property taxes
4	Recycling
3	Disposal of nuclear/chemical waste
3	Ag. chemical use
3	Michigan education system
3	State parks
3	Farmland preservation
2	Maintenance of MI roads
2	Logging of MI land
2	Contaminated freshwater fish
2	Toxic waste
1	Wetlands
1	Abandoned oil wells/drill sites
1	Use of Michigan land

In the four-stage Delphi questionnaire number two respondents were asked to rank how important each issue was by using a four point Likert-

scale. For analysis purposes, each response was assigned a corresponding value, 1 through 4. Table 33 is the key for the Likert scale questions in questionnaire number two.

Table 33

Key to Likert scale questions for Four-stage Delphi - Questionnaire #2

KEY		
NI	Not important	1.00 - 1.49
LI	Low importance	1.50 - 2.49
VI	Very Important	2.50 - 3.49
EI	Extremely Important	3.50 - 4.0

The respondents were asked to rank level of importance of each issue (Table 34). They were encouraged to write comments indicating their reason for giving a specific importance level. The means for each issue then was used to give rankings to the issues for questionnaire number 2.

In Questionnaire number two the respondents ranked one issue at low importance and fifteen issues as very important and four issues as extremely important. The respondents ranked Michigan education system, disposal of nuclear/chemical wastes, disposal of toxic wastes, and drinking water as the extremely important issues.

Table 34

**Four-stage Delphi: Questionnaire #2 - Importance Ranking**

Issues	NI	LI	VI	EI
1. Water pollution			3.32	
2. Food safety			3.00	
3. Landfills			3.42	
4. Air pollution			3.11	
5. Michigan economy			3.28	
6. Drinking water				3.5
7. Property taxes			3.21	
8. Recycling			3.32	
9. Agricultural chemical use			2.88	
10. Disposal of nuclear and chemical waste				3.56
11. Saving farmland			3.12	
12. Michigan education system				3.62
13. State parks		2.47		
14. Toxic waste				3.50
15. Maintenance of Michigan roads			3.29	
16. Logging of Michigan woodlands			2.81	
17. Contaminated freshwater fish			3.00	
18. Use of Michigan land			2.87	
19. Wetlands			2.88	
20. Abandoned oil wells/drill sites			2.59	

Respondents had the opportunity to write comments about each issue on the first questionnaire to assist in establishing the issue statement for questionnaire number two. For each issue comments were grouped into positive, negative, and neutral categories (Tables 35 - 54).

Table 35

Written comments by respondents to the issue "Water pollution" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	1	9
Negative	7	64
Neutral	3	27
TOTALS	11	100.0

#### Positive

Quality has been improving over the years - but still needs work.

#### Negative

The pollution we acknowledge is probably only the tip of the iceberg.

People who are polluting should be stopped and forced to pay for clean up.

This also involves runoff from agriculture.

Concerned about what is happening to the Great Lakes - especially fish.

This is mainly a rural area but is polluted. Each area should be better informed.

A quick way to eliminate the population.

Must try not to alter nature.

#### Neutral

With proper safety for industrial, controlled regulation.

Do we really know how bad this is?

Do insecticides and fertilizers, etc. pollute our well water?



Table 36

Written comments by respondents to the issue "Food safety" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	6	55
Negative	4	36
Neutral	1	9
TOTALS	11	100.0

#### Positive

I think Michigan has always been a leader in food safety. Let's stay in leadership.

State should maintain strict rules and enforce them.

I think generally people still have faith in inspections.

I know of no threats.

Media will weed out unsafe companies.

Apparently no critical problem now.

#### Negative

Especially with FDA regulations; seeing harmful effects of years past.

Types of pesticides used in spraying.

Need information everyone can understand.

Hormones, etc. fed to animals are they safe for us to eat?

#### Neutral

Our lives depend on the safety of the food we eat. FDA rules/regu. should be enforced to the limit.

Table 37

Written comments by respondents to the issue "Landfills" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	1	7
Negative	8	62
Neutral	4	31
TOTALS	13	100.0

#### Positive

Not enough is done fast enough to supply landfills.

#### Negative

We can't ignore our past misuse, we can be accountable for future use.

Safety regulation instead of filling land - build incinerators.

Also connects to drinking water and water pollution.

Out of state trash should be stopped.

One of the quickest ways to pollution.

Toxic runoff must be controlled.

Do they pollute well water?

Apparently filling up need more safe locations.

#### Neutral

We need to invest heavily in researching alternative solutions (mandatory recycling!).

DNR should help find areas for landfills.

We should use landfills for degradable products - paper, food garbage, grass.

We need them, but they need to be safe.

Table 38

Written comments by respondents to the issue "Air pollution" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	5	39
Negative	1	7
Neutral	7	54
TOTALS	13	100.0

#### Positive

Our air should be appreciated before we have pollution. Let's not wait for it to be a problem.

Quality has improved over years and MI is pretty fortunate, but we can't slack off monitoring.

Continue to monitor air pollution and make industrial companies responsible for the air they pollute.

In this area its [sic] good.

Apparently adequately controlled.

#### Negative

Large factories could use better purifies [sic] to help clean up smoke.

#### Neutral

Present air pollution rules should be enforced.

We should be emission testing older cars rather than new cars (5 years and up).

Clean air is essential.

How bad is this in rural Michigan?

Produce better efficiency engine manufacturing.

Want to breathe clean air.

More work on auto emissions. (Ethanol fuel and battery powered).

Table 39

Written comments by respondents to the issue "Michigan economy" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	2	14
Negative	6	43
Neutral	6	43
TOTALS	14	100.0

#### Positive

Michigan's economy is fairly stable.

Provides funds for needed protective measures and services.

#### Negative

I really think the working class are held too accountable for everyone's finances.

Bring in new jobs and training for a new way of life. Can't rely on auto manufacturers.

This is affecting everyone.

Is down at present time- Engler has hurt the UP terribly- Hope it will change.

Need to make a living here to like to live here.

Government cannot spend more than taken in (balance budget).

#### Neutral

Important, but what can we do? Business cycles usually repair themselves; federal gov. and federal reserve have more power than we do.

If government keeps hands off, I'm sure economy will improve.

Need to become more diversified from being reliant on auto industry.

Need more information.

Lower taxation on business so they will return to Michigan - the difference will be made up with income from employment.

More factories.

Table 40

Written comments by respondents to the issue "Drinking water" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	4	40
Negative	3	30
Neutral	3	30
TOTALS	10	100.0

#### Positive

High standards for purity of drinking water must be maintained.

We have good drinking water but for how long?

Michigan has the best today - keep it that way.

I like safe water to live healthy.

#### Negative

Need to propose uniform standards and routinely monitor; rust is a problem.

More water purification plants needed.

Too much talk and studies not enough action.

#### Neutral

An ounce of prevention - it shouldn't become a problem before it becomes our concern.

People are becoming more aware of this problem

All wells should be tested periodically.

Table 41

Written comments by respondents to the issue "Property taxes" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	3	27
Negative	7	64
Neutral	1	9
TOTALS	11	100.0

#### Positive

We need to support our economy if we wish to have the slightest impact on its direction.

Prime source of funds for education.

Would like to (get) a bang for the buck, must pay for what I get.

#### Negative

The working class is coming close to giving 50% of everything for taxes. Not wise.

Legislature must act to lower property taxes since state and local officials don't even try to help property owners.

Factor in attracting new business as well as new residents.

How much more can we afford.

Too high-not enough time spent by our government to solve this problem. Engler is not the answer.

The taxes are horrendous [sic] in this area compared to Detroit where they receive the most benefits and jobs and industry.

Very unfair way of taxation - you are not equally taxed.

#### Neutral

More jobs would help cut taxes.

Table 42

Written comments by respondents to the issue "Recycling" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	6	46
Negative	2	15
Neutral	5	38
TOTALS	13	100.0

#### Positive

Should be high priority. No better way to insure natural resources for the future.

Better programs must be instituted.

Better recycling programs will result in extending landfill life, as well as, the ecological savings.

We try to recycle as much as possible.

It should be done now, protect our world.

Mandatory recycling the only way to significantly reduce waste.

#### Negative

Not enough recycling programs and/or companies using recycled products. Companies w/in MI need to reconsume packaging it sells. (some containers are not accepted at recycling centers even though they are recyclable).

Not enough people are doing it.

#### Neutral

Need more pick up times for home furniture, such as bedding and appliances.

Also connects to landfills

It's not been tried sufficiently enough to comment. During World War II it was more required.

Need more Michigan factories to produce products from recycled material.

Depends on availability of landfills.

Table 43

Written comments by respondents to the issue "Agricultural chemical use" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	2	18
Negative	4	36
Neutral	5	45
TOTALS	11	100.0

#### Positive

I believe the present regulations are satisfactory.

Sometimes it is necessary for chemical use to increase yield and keep prices down.

#### Negative

We shouldn't let this get out of hand.

Have much concern on types of pesticides used.

Do not use chemicals that will harm wildlife.

More research on being harmful after we eat vegetables and meat.

#### Neutral

Let's not have a "that's [sic] the way we've always done it attitude"  
What are our options over chemicals?

Not as much of an issue anymore w/such strict regulations. But would rather buy wilted lettuce than chemical laced lettuce.

Proper useage [sic] from farmer, home

We need to be sure that the farmers are using these properly.

Need more information.



Table 44

Written comments by respondents to the issue "Disposal of nuclear and chemical wastes" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	0	0
Negative	5	45
Neutral	6	55
TOTALS	11	100.0

#### Negative

We don't want to produce environmental and economic bads for the sake of a few goods.

Cut out use of nuclear plants.

How can we dispose of something with a half life of thousands of years.

This is going to get us all.

Should be done in states where there is very little rainfall -desert areas, etc.

#### Neutral

Same as any waste -Recycle. Our world is not disposable.

Government should make a stronger effort in this area.

There must be a way to get rid of chemical waster other than bury it in the ground.

We need to be informed.

Michigan is major producer of such wastes.

Not very informed on this issue.

Table 45

Written comments by respondents to the issue "Saving farmland" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	6	60
Negative	0	0
Neutral	4	40
TOTALS	10	100.0

#### Positive

It's one of the basics we take for granted. We're not so clever that we don't need it.

Fertility of MI farmland is one of our assets.

It is of utmost importance if we are to survive in the future to save more farmland from development.

A special grant should be established to redevelop vacant farmland.

We must save the farms or pay the price, or make the land produce more.

If we don't, who is going to feed us.

#### Neutral

Large rancher and farmers are making a monopoly-same as big business Wisconsin is good example.

We can see more land going to residential use in this area.

?

Need more initiatives for small farms to make a living.

Table 46

Written comments by respondents to the issue "Michigan education system" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	2	18
Negative	3	27
Neutral	6	55
TOTALS	11	100.0

**Positive**

I think there are too many children per teacher. Otherwise doing a good job.

Most valuable resource.

**Negative**

We have to realize that more money is not the answer. More dedicated teachers and educators could help.

We need to do a better job.

In this area it needs a lot of improvement. Back to basics!

**Neutral**

It's important to have a decent education but also jobs to go to.

Should be upgraded to ensure competencies - not just cognitive knowledge.

Engler does not do something about school finance soon. He will kill the high level of education in Michigan.

Stop busing in the inner city - use the money for education instead use the schools in your area.

A Nations future can be measured by its education today. But keep it simple, don't complicate it.

Need more reliable information on choice, school issues, and private vs. public.

Table 47

Written comments by respondents to the issue "State parks" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	4	40
Negative	1	10
Neutral	5	50
TOTALS	10	100.0

**Positive**

Keep them natural, not commercialized.

Important to the economy.

I use the state parks in MI they are fine.

Seem to be run quite well.

#### Negative

If we can't get the economy going, who's going camping.

#### Neutral

Need to insure preservation of so that they will remain parks in future.  
Get more community action and volunteer groups to assist in clean ups.

Should be maintained and kept safe for all to use.

Cost of parks is rising too high for what they offer. They are very good and use them very much.

Don't use them.

Should be supported by the people who use them-not from the general tax fund.

Table 48

Written comments by respondents to the issue "Toxic waste" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	1	11
Negative	2	22
Neutral	6	67
TOTALS	9	100.0

#### Positive

It is good the way it is handled and easy for me to dispose of old waste.

#### Negative

This is going to get us all.

Clare county -Harrison area- twenty lakes twenty minutes and the County commissioners are trying to put a landfill in the middle of them (poor judgement.

#### Neutral

Find a use for them, they're only waste if no one wants them

We need to effectively dispose of it so it is not a problem for future generations.

Better controls and penalties for violators.

Grants established to help build plants, lower cost of disposal of waste.

Need better information and true facts.

Need to be more informed and should be known where to take it.

Table 49

Written comments by respondents to the issue "Maintenance of Michigan roads" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	0	0
Negative	6	55
Neutral	5	45
TOTALS	11	100.0

#### Negative

Effects economic well-being of state.

State must do a better job of inspection when contractors are rebuilding too much sloppy work is getting by.

Stop this wasteful way of cold patching the roads. There are better ways, teach the cities and counties. Stop repairing on rainy days tar and water don't mix.

In this area is there a maintenance crew that works?

Poorly maintained trucking should be taxed higher - their heavy weights are what destroys the road.

In need of repair badly.

#### Neutral

Use the prison population for manual maintenance, road commission for high tech.

Potholes are becoming a problem - have road test sites produced any alternative uses?

Good roads are needed to transport Michigan people and products.

Who's going to pay for it.

Some areas very good some are very bad - U.P. does not get there fair share of road repairs.

Table 50

Written comments by respondents to the issue "Logging of Michigan woodlands" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	1	11
Negative	1	11
Neutral	7	78
TOTALS	9	100.0

#### Positive

Fine as long as its replenished and balance kept.

#### Negative

Too much clear cutting - do not replace trees fast enough. They are killing our woodlands.

#### Neutral

Big issue in the UP. Society is stressing tree planting yet we're chopping them down? We should stress away from clearcutting and push replanting.

Loggers or property owners must be forced to replant after logging.

The logging companies must insure replacement planting.

Replant or replace with new trees with Michigan white pine.

We need to regulate logging to be sure the land is reseeded with trees.

Better information.

Stop clear cutting and have a planting program - if you cut plant.

Table 51

Written comments by respondents to the issue "Contaminated freshwater fish" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	1	10
Negative	6	60
Neutral	3	30
TOTALS	10	100.0

**Positive**

I think this is over publicized.

**Negative**

They're trying to tell us something. Clean up our act.

Effects of past pollution and lack of disposal sites showing up in our fish; natural resources (air, land, water, etc.) should be among top priorities so we can preserve ourselves and our future.

Hurts potential for a Great Lakes fishing industry.

Eat less.

They waited too long to do something about this.

Where are contaminants coming from. Need to correct this issue.

**Neutral**

Purify industrial waste before entering streams and rivers.  
Monitor near plants not 20 miles downstream.

The public needs to be informed.

Depends on relationship to safe potable water.

Table 52

Written comments by respondents to the issue "Use of Michigan land" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	2	20
Negative	2	20
Neutral	6	60
TOTALS	10	100.0

**Positive**

Michigan land should not be abused.

More concern to prevent and protect Michigan lands.

**Negative**

When MI land is sold for development owners should be able to get all fees and permits without hassle.

Priority human persons and non-human beings.

**Neutral**

If used commercially there should be accountability to maintain ecology.

We live here, we should be concerned about it. Many issues are not publicized enough.

Land should be used to our best advantage - not destroyed by off road vehicles.

Need more information about its use.

Don't understand the question.

Need more small farms.

Table 53

Written comments by respondents to the issue "Wetlands" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	6	55
Negative	3	27
Neutral	2	18
TOTALS	11	100.0

**Positive**

We have them for a reason. Let's take care of them.

If wetlands disappear, wildlife disappears; ecological balance shifts.

I believe existing wetlands should be preserved where possible.

Imperative to safe for the purpose of nature's balance of wildlife.

We can't continue to drain wetlands.

Wild fowl need homes too.

**Negative**

If we don't stop the DNR where will we farm.

Need cleaning up.

Not all standing water sites need be preserved. Just what is needed for migratory fowl and drinking water.

**Neutral**

Make it useful land where needed and leave marshlands alone.

I think DNR is overboard on some points of protecting wetlands.



Table 54

Written comments by respondents to the issue "Abandoned oil wells/drill sites" grouped according to positive, negative, or neutral.

Type of Comment	Number	%
Positive	0	0
Negative	2	20
Neutral	8	80
TOTALS	10	100.0

#### Negative

Depends on effect on underground water.

This may have something to do with our water contamination, plug unused wells.

#### Neutral

Those who profit from the sites should pay for the restoration.

Public/environmental nuisance and hazard. If wells are not producing, the sites should be returned to natural conditions. This should be required

I believe they should be restored to original state.

Clean up. Fill in.

They should be returned to original condition.

I do not see too much of a problem with this. I see growing crops where there was oil wells.

There are many in this county.

If the well is not producing the driller should have to plug the well with cement.

In the four-stage Delphi questionnaire number three respondents were asked to rank their level of agreement on each issue statement. This questionnaire again used a four point Likert- scale. For analysis purposes, each response was assigned a corresponding value, 1 through 4. Table 55 is the key for the Likert scale questions in questionnaire number three.

Table 55

Key to Likert scale questions Four-stage Delphi - Questionnaire #3

KEY		
SD	Strongly disagree	1.00 - 1.49
D	Disagree	1.50 - 2.49
A	Agree	2.50 - 3.49
SA	Strongly agree	3.50 - 4.0

Table 56 lists the agreement participants had toward each issue.

The issues are listed in importance order as determined by questionnaire number two.

Respondents strongly agreed with only two issue statements, freshwater fish contamination being stopped and Michigan's economy relying on other industry besides the automobile industry. Banning the use of processes that generate nuclear wastes, lack of communication being the major problem with toxic waste disposal, and being proud of the Michigan kindergarten through twelfth grade education system were the issue statements with which the respondents disagreed.

Table 56

Four-stage Delphi: Questionnaire #3 - Levels of Agreement

Issue Statement	SD	D	A	SA
1.*** Michigan can be proud of its K-12 grade educational system.		2.22		
2.*** Processes that generate nuclear wastes should be banned because the wastes cannot be disposed of properly.		2.24		
3.*** Currently, Michigan has good, pure drinking water.			2.72	
4.*** The methods of toxic waste disposal are adequate; the problem lies with communication.		2.33		
5.** Michigan should research possible permanent alternatives to landfills.			3.33	
6.** Recycling programs within MI should be more uniform.			3.11	
7.** The water pollution we acknowledge is only a small part of the real problem.			2.88	
8.** Michigan's economy must begin to rely on other areas besides the automobile industry.				3.61
9.** Property tax reform measures should be introduced.			3.39	
10.** Farmland must be preserved in order to have food now and in the future.			3.11	
11.** Well maintained roads are worth paying for.			3.39	
12.** Sources of pollution which contaminate our freshwater fish must be found and stopped.				3.50
13.** Wetlands need to be protected and preserved because they are needed for the survival of wildlife.			3.17	
14.** MI should increase air quality through government regulation.			2.82	
15.** Current food safety standards meet consumers' needs.			2.78	

Table 56 continued

Four-stage Delphi: Questionnaire #3 - Levels of Agreement

Issue Statement	SD	D	A	SA
16.** MI farmers should decrease their use of agricultural chemicals.			3.00	
17.** MI land usage should be based on well developed plans.			3.19	
18.** Intense logging is sound if replanting is adequate.			2.56	
19.** Abandoned oil well/drill sites should be restored to their undisturbed state.			3.41	
20.* Because of their importance, the quality of MI state parks is the responsibility of all MI people.			2.94	

\*\*\* = Extremely important

\*\* = Very important

\* = Low importance

Respondents had the opportunity to add comments to each issue statement to clarify their position. Comments were grouped into agree, disagree, and neutral categories. The following lists are the comments made by respondents to issue statement on questionnaire number three.

1. Michigan can be proud of its kindergarten through twelfth grade educational system.

Disagree

Our educational system is a disgrace too many politicians and educators think that more money is the cure.

In this area our schools are a disgrace. We have few teachers dedicated to teaching. Children have graduated who are illiterate. It's a fact!

Too many areas of the state with high drop out rates and poor performances.

Not cost effective teachers overpaid.

Weak -incorrect goals.

Neutral

1. Financing    2. Too many students per teacher to teach properly.

Stop bussing in the inner city use that money for education and the education system will improve more.

The governor must not cut state aid but work on a better school finance plan.

2. Processes that generate nuclear wastes should be banned because the wastes cannot be disposed of properly.

Disagree

If we eliminate nuclear power plants, we will cause more pollution with others.

We need nuclear energy. The wastes could be disposed of properly if we really set our minds to find the way.

Nuclear energy is the cleanest way today to produce electricity - store the waste in the desert away from water supply - as time goes on someplace else will be found. Maybe outer space.

We should not worry about banning-but find a way to dispose of the waste.

Neutral

Safe waste management is indispensable [sic].

Citizens are not informed that this is true or false. Can nuclear wastes be disposed of without later hazards [sic]? For how long?

To[sic] political.

Too many lies about things.

3. Recycling programs within Michigan should be more uniform.

Agree

The whole state has to ban [sic] together to make it work. Too costly otherwise.

Recycling stations should be more accessible and manufacturers should be required to use recycled material.

In this area recycling bases are next to non-existent [sic]. This could create jobs and money for this problem. Needs to be tried.

Every place should have the same system it should be a national project.

Especially in Marquette.

Neutral

A whole new waste management system is needed.

4. Michigan should research possible permanent alternatives to landfills.

Agree

Recycle, a good start.

Incinerators could do it.

Burn and what won't burn recycle.

Neutral

Effects on underground water - long term - must be investigated.

Much of our waste is not necessary.

Landfills could still be used for biodegradable materials.

Once again they say we have no landfills but are doing nothing to help solve the problem.

5. The methods of toxic waste disposal are adequate; the problem lies with communication.

Agree

Very much so - as we hear it. Disposal is not adequate if not so - very bad communications.

The public has no real knowledge concerning this.

Disagree

The problem lies in enforcement and lack of penalties.

Waste management does not care about the environment they have been caught too many times illegiatley [sic] dumping.

Neutral

Toxic waste must be isolated at the source, stored, and if possible recycled to industry.

6. Currently, Michigan has good, pure drinking water.

Agree

True protect it!

90% of Michigan.

Disagree

I don't believe any pure drinking water exists today.

More water purification need [sic] for city and factory.

Neutral

We have to work on chemicals put on plants, etc. to see if they eventually go to our drinking water.

Water is key resource. We can't afford to contaminate it.

In this area we have good water, but not in all of Michigan.

7. The water pollution we acknowledge is only a small part of the real problem.

Agree

Pollution is still occurring we need better supervision and enforcement  
Very true.

Neutral

Air pollution

Storm water runoff through sanitary sewer lines, or from sewer lines to rivers must be curtailed if not stopped.

8. Michigan's economy must begin to rely on other areas besides the automobile industry.

Agree

Must have an initiative to start up new industry.

We need to generate and promote other industries on a long term basis.  
To do it we need to retrain.

Very true.

Neutral

It's apparent Michigan is losing to imports! Why, is the import superior or just cheaper?

Michigan has taxed away the automobile business.

9. Property tax reform measures should be introduced.

Agree

We need legislators who will act and make this issue at the top of the list and forget their petty political differences.

Develop a uniform way of taxation.

Very Very true.

Disagree

Not until we find another way to fund our schools and county governments.

Neutral

It is unfair to tax unrealized inflation.

Our taxes are high. I believe we support the larger cities. Cities have jobs and should support themselves.

Incentives should be provided for home maintenance [sic] -especially older homes.

Politics must stop.

10. Farmland must be preserved in order to have food now and in the future.

Agree

We need more initiative to develop more small farmers. (through schools?)

We need to control sprawl.

More effort should be made to preserve farmland. How about tax breaks.

While jobs are being lost why aren't areas that are deteriorating being cleared and reconstructed instead of taking farmland?

Must preserve the family farm instead of allowing creation of corporate farms.

Yes very true.

11. Well maintained roads are worth paying for.

Agree

Michigan roads are bad. The worse they get, the more it will cost to repair.

Maintained roads would save on the frequent and costly auto repairs.

Saves gas, time

Need to introduce toll roads. The condition of our roads is disgusting.

Disagree

Is it possible to widen existing roads? If we can't support old roads how can we maintain new roads?



Neutral

We must limit the weight and speed of trucks. They are causing 90% of the damage to roads.

We are paying for them I believe the gas money is not in the right places.

12. Sources of pollution which contaminate our freshwater fish must be found and stopped.

Agree

Check all ships before entering Great Lakes. No more factory pollution.

Pollution is still occurring we need better supervision and enforcement

To my knowledge, laws regarding [sic] fish products are needing attention.

Fine, if possible, sources of pollution. Fines going into clean up expenses.

I think the sources are known the method of stopping it is the problem.

True.

13. Wetlands need to be protected and preserved because they are needed for the survival of wildlife.

Agree

We have to recognize that mother nature had some pretty good ideas.

Either protect the wetlands or forget wildlife its [sic] that simple.

Disagree

I feel the D.N.R. rules are too strict now.

Presently the DNR puts too much emphasis in this area more sensible approach is needed.

Neutral

We look to our leaders for answers thinking they set a whole picture, nationwide. Do we believe what's on TV or our political figures elected to do this job.

Lots of wetlands are damaged by loggers.

14. Michigan should increase their air quality through government regulation.

Agree

Each one of us needs to learn more about this.

I think it is the only way.

Disagree

We have too much government regulations, need better enforcement.

Why does the government have to regulate? Set the standards!

All the government does is talk and take money - need reliable people.

Neutral

Provided regulations aren't unrealistic and excessively costly to consumer.

15. Current food safety standards meet consumers' needs.

Neutral

Are all additives safe? Hormones to animals, insecticides and fertilizers.

Food contents need to be clearly stated not disguised so the average person needs a dictionary to shop.

Not sure of this.

16. Michigan farmers should decrease their use of agricultural chemicals.

Agree

I believe the use of agricultural chemicals should be greatly reduced.

Disagree

Sometimes chemicals are the best and cheapest method.

Need this to help crops. A farm can be wiped out in a couple of days if not watched.

Neutral

The public needs to know what the use of chemicals mean.

17. Michigan land usage should be based on well developed plans.

Agree

Many areas are left to become slums. They should torn down and re-developed.

Neutral

Whose plans? Land owners should have some voice in this.  
State land only.

18. Intense logging is sound if replanting is adequate.

Agree

If replanting is adequate.

Replanting is the answer.

Disagree

Intense logging? It takes years, for replanting to come to fruition.  
Intense logging no matter what the replanting destroys nature's balance.  
Replanting is not soon enough after logging is done.

Neutral

I think selective logging and cutting is better, along with replanting.  
Log at maturity rate. Keep woods diverse.

19. Abandoned oil well/drill sites should be restored to their undisturbed state.

Agree

I think this is a possibility for polluting our water.  
It is my understanding that this practice is presently in effect.

Why not? Those who profit from these wells should restore them.

Not because of natural habitat but also safety.

Pull the pipes and fill the hole.

True they disturb the land when they put in well - so now put it back to its original state.

20. Because of their importance, the quality of Michigan state parks is the responsibility of all Michigan people.

Agree

The responsibility of all people who use them - most parks are excellent - but there are a few that are very bad. State should not make any difference. We should all be clean and proud.

Disagree

Aren't we paying for them now? Let the users pay the major portion of the expense.

Par

Neu

Esp

Prin

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proud

system

Parks should be maintained by the people who use them.

Neutral

Especially the people using these facilities.

Primarily users.

Questionnaire number four was designed to confirm the level of agreement on each issue and to have the group come to a consensus on the level of agreement for each issue statement. Table 57 indicates the number of respondents who agreed and disagreed with the specific statement and the percent.

Note in Table 57 that four-stage Delphi participants agreed at the 100% level for six issue statements. The issue statements were developed from the comments made on questionnaire number two. The issue statements that they agreed with are, "Michigan should research possible permanent alternatives to landfills.", "Michigan's economy must begin to rely on other areas besides the automobile industry.", "Property tax reform measures should be introduced.", "Well maintained roads are worth paying for.", "Sources of pollution which contaminate our freshwater fish must be found and stopped.", "Michigan land usage should be based on well developed plans.", "Abandoned oil well/drill sites should be restored to their undisturbed state."

As a whole, the respondents disagreed with the issue statements concerning banning processes that generate nuclear wastes, lack of communication regarding toxic waste disposal being the problem and being proud of the Michigan kindergarten through twelfth grade education system.

Table 57

**Four-stage Delphi: Questionnaire #4 - Levels of Agreement**

Issue Statement	Disagree (N)	%	Agree (N)	%
1.*** Michigan can be proud of its K-12 grade educational system.	13	72.2	5	27.8
2.*** Processes that generate nuclear wastes should be banned because the wastes cannot be disposed of properly.	12	66.7	6	33.3
3.*** Currently, MI has good, pure drinking water	5	27.8	13	72.2
4.*** The methods of toxic waste disposal are adequate; the problem lies with communication.	14	82.4	3	17.6
5.** Michigan should research possible alternatives to landfills	0	0	18	100.0
6.** Recycling programs within MI should be more uniform.	1	5.6	17	94.4
7.** The water pollution we acknowledge is only a small part of the real problem.	1	5.9	16	94.1
8.** Michigan's economy must begin to rely on other areas besides the automobile industry.	0	0	18	100.0
9.** Property tax reform measures should be introduced.	0	0	18	100.0
10.** Farmland must be preserved in order to have food now and in the future.	2	11.1	16	88.9
11.** Well maintained roads are worth paying for.	0	0	17	100.0
12.** Sources of pollution which contaminate our freshwater fish must be found and stopped.	0	0	18	100.0
13.** Wetlands need to be protected and preserved because they are needed for the survival of wildlife.	3	16.7	15	83.3

\*\*\* = Extremely important

\*\* = Very important

\* = Low importance

Table 57 continued

**Four-stage Delphi: Questionnaire #3 - Levels of Agreement**

Issue Statement	Disagree (N)	%	Agree (N)	%
14.** MI should increase air quality through government regulation.	5	29.4	12	70.6
15.** Current food safety standards meet consumers' needs.	4	22.2	14	77.8
16.** MI farmers should decrease their use of agricultural chemicals.	2	12.5	14	87.5
17.** MI land usage should be based on well developed plans.	0	0	18	100.0
18.** Intense logging is sound if replanting is adequate.	7	38.9	11	61.1
19.** Abandoned oil well/drill sites should be restored to their undisturbed state.	0	0	17	100.0
20.* Because of their importance, the quality of MI state parks is the responsibility of all MI people.	4	22.2	14	77.8

\*\*\* = Extremely important

\*\* = Very important

\* = Low importance

On questionnaire number four respondents were instructed to add a comment to clarify their responses if needed. By this stage most respondents had come to a decision as to whether they agreed or disagreed with each issue statement, they were aware that further discussion would not be used in another questionnaire. Comments are grouped into agree, disagree, neutral categories.

1. Michigan can be proud of its kindergarten through twelfth grade educational system.

**Disagree**

There are still areas of the state whose K-12 is not adequate.

Not in this area. These questions have all been answered before!

**Neutral**

The problem with school children stems from the home not from the school.

More money is not the solution. We need teachers and administrators who will work to improve the system.

2. Processes that generate nuclear wastes should be banned because the wastes cannot be disposed of properly.

**Agree**

Is this statement true? If it is, then I agree, this should be banned!

**Disagree**

We need to develop more nuclear power.

**Neutral**

Then lets [sic] develop the means of safely disposing or reusing the wastes.

3. Recycling programs within Michigan should be more uniform.

(No comments.)

4. Michigan should research possible permanent alternatives to landfills.

**Agree**

Why not incinerate more.

5. The methods of toxic waste disposal are adequate; the problem lies with communication.

**Disagree**

If it's adequate why due [sic] we ship it out of state.

Research shows this problem crops up again in the years ahead and is not adequate!

**Neutral**

Enforce present disposal regulations.

6. Currently, Michigan has good, pure drinking water.

**Agree**

In this area the water is good.



**Disagree**

Need more purification plants.

7. The water pollution we acknowledge is only a small part of the real problem.

**Neutral**

Lack of proper enforcement.

8. Michigan's economy must begin to rely on other areas besides the automobile industry.

**Neutral**

Already answered this question previously.

9. Property tax reform measures should be introduced.

**Agree**

Lets [sic] elect legislators who will do the job and forget politics.

10. Farmland must be preserved in order to have food now and in the future.

**Disagree**

I have the right to sell if need.

11. Well maintained roads are worth paying for.

**Neutral**

More roads are being built than this economy can support. If old roads could be widened it might help.

Lets [sic] get the over weight trucks off the roads.

12. Sources of pollution which contaminate our freshwater fish must be found and stopped.

(No comments.)

13. Wetlands need to be protected and preserved because they are needed for the survival of wildlife.

**Agree**

If the particular wetland fosters animals, not just mosquitos.

**Disagree**

Alot [sic] of wet land only bread [sic] insects who needs them.

**Neutral**

But not at any cost.

14. Michigan should increase air quality through government regulation.

Disagree

Industry must do this without government pressure.

Neutral

Air quality is or should (be) regulated by each and (e)very state.

Each person should accept the responsibility. The government can't sit on everyone.

15. Current food safety standards meet consumers' needs.

Disagree

There are sick animals being used for meat and dairy, somehow this must be stopped.

16. Michigan farmers should decrease their use of agricultural chemicals.

Neutral

Farmers need to be educated on chemicals used.

Looking at both sides of the issue needs looking into.

17. Michigan land usage should be based on well developed plans.

Agree

Should be handled on state wide plans. Bypass local zoning boards.

18. Intense logging is sound if replanting is adequate.

Disagree

It is not adequate and takes years to replenish.

Neutral

Trees take years to grow, therefore careful logging must be practiced to maintain soil and wildlife.

19. Abandoned oil well/drill sites should be restored to their undisturbed state.

(No comments).

20. Because of their importance, the quality of Michigan state parks is the responsibility of all Michigan people.

Neutral

The people who play should have to pay.

People who use them should pay for the upkeep and maintenance

#### IV. Three-stage Delphi and Four-stage Delphi comparison

The issues ranked in the three-stage Delphi were identified from the review of literature. The issues ranked in the four-stage Delphi were identified by respondents who answered questionnaire number one. The similar issues are identified by an "\*\*." (Table 58) There are nine issues that are similar and eleven issues that are different, due to differing comments from the three-stage and four-stage Delphi participants the Michigan land use issue was different. Drinking water and groundwater were considered to be similar issues because Michigan's drinking water is mainly from groundwater sources.

#### Summary

The results of data analyses for the study were reported in this chapter. The results were presented in four sections. The first section consisted of respondent characteristics. The second section was the three-stage Delphi descriptive statistics and comments the third section contained the four-stage Delphi list of issues, descriptive statistics and comments. Finally, the fourth section showed a final comparison of issues identified by research (three-stage Delphi) versus the issues identified by consumers (four-stage Delphi).

Chapter V contains a summary of the study, conclusions, recommendations, and implications.

Table 58

Ranking of Issues: Three-stage Delphi and Four-stage Delphi

	Issue - Three-stage (research-identified)	Issue - Four-stage (consumer-identified)	
1	* Saving Farmland	Michigan education system	1
2	* Property taxes	Disposal of nuclear and chemical wastes	2
3	* Food safety	* Drinking water	3
4	* Use of Michigan land	Toxic waste	3
5	* Groundwater	* Landfills	5
6	* Clean air	* Recycling	6
7	* Recycling	Water pollution	6
8	* Landfills	Maintenance of MI roads	8
9	Attracting tourists	Michigan economy	9
10	* Agricultural pesticide use	* Property taxes	10
11	Understanding how food moves from producer to your table.	* Saving farmland	11
12	Greenhouse effect	* Air pollution	12
12	Organic farming	Contaminated freshwater fish	13
14	Lawn pesticide use	* Food safety	13
15	Disposal of animal wastes as it relates to food production.	* Agricultural chemical use	15
16	* Wetlands	* Wetlands	15
17	International food trade	* Use of MI land	17
18	Genetic engineering	Logging of MI woodlands sites	18
19	Animal rights/welfare	Abandoned oil wells/drill sites	19
20	Acid rain	State parks	20

\* = Similar issues

CHAPTER V  
SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to identify the concerns of Michigan people as they relate to the environment, food production and consumption, the use of Michigan land (forests, state parks, shorelines, etc.), pollution, and international food trade. The specific objectives of the study were:

1. To identify consumer-type agricultural issues that are of concern to Michigan people.
2. To ascertain differences and similarities between issues identified by consumers and issues identified from research.

The sample included 150 people who were selected by systematically randomizing a population of 300 Michigan residents. Of the 150 initially contacted, seventeen (17) people agreed to participate in the three-stage Delphi (research-identified issues) and twenty-three (23) people agreed to participate in the four-stage Delphi (consumer-identified issues). Of the forty (40) people that initially agreed to participate thirty-three (33) of them consistently replied to the Delphi questionnaires (14 for the three-stage and 19 for the four-stage).

The surveys followed a standard Delphi process and utilized an open-ended question for the first questionnaire, two questionnaires with a four-point Likert scale and one questionnaire with a dichotomous disagree/agree scale. The two Likert-scale questionnaires determined level of importance and level of agreement.

The returned questionnaires were processed by computer using the Statistical Package for the Social Sciences (SPSS, 1987), SPSS/PC+ version. The Likert-type scale questions were analyzed using descriptive statistics, frequencies and means.

## Findings

A summary of the objectives that guided the research process are followed by selected major findings described in Chapter IV.

Objective 1: To identify consumer-type agricultural issues that are of concern to Michigan people.

1. The top five issues identified in the four-stage Delphi included Michigan education system, disposal of nuclear and chemical wastes, drinking water, toxic waste, and landfills. These issues were identified by the respondents.
2. The three-stage Delphi participants ranked saving farmland, property taxes, food safety, use of Michigan land, and groundwater as the top five issues. These issues were identified for them via literature research.
3. The three-stage Delphi (research-identified) issue statements, their order of importance, and the final number of respondents who agreed and disagreed are compiled in Table 30 in Chapter IV.
4. The four-stage Delphi (consumer-identified) issues statements, their order of importance, and the final number of respondents who agreed and disagreed are compiled in Table 56 in Chapter IV.

Objective 2: To ascertain the differences and similarities between issues identified by consumers and issues identified from research.

3. There were differences among issues identified from research (three-stage Delphi) and issues identified by consumers (four-stage Delphi). The three-stage Delphi had 11 issues that were not identified by the consumers. The 11 issues were use of Michigan land (emphasized natural sites of beauty), attracting tourists, understanding how food moves from producer to your table, organic farming, Greenhouse effect,

lawn pesticide use, disposal of animal wastes as it relates to food production, international food trade, genetic engineering, animal rights/welfare, and acid rain.

The four-stage Delphi participants identified 11 issues that were not in the top twenty issues identified by research. The 11 issues are Michigan economy, water pollution, disposal of nuclear and chemical waste, Michigan educational system, state parks, toxic waste, maintenance of Michigan roads, logging of Michigan woodlands, contaminated freshwater fish, use of Michigan land (four-stage emphasized land use planning), and abandoned oil wells/drill sites

4. There were nine similar issues identified by research and by the consumers. The nine issues were saving farmland, air pollution/quality, recycling, landfills, agricultural pesticide (chemical) use, wetlands, groundwater/drinking water, food safety and property taxes.

### Conclusions

1. The three-stage Delphi issues more closely resemble issues identified by CES, commodity groups, MDA, and SAESs due to the initial identification of issues coming from the literature.
2. The four-stage Delphi issues are consumer-identified issues that differ from issues identified by CES, commodity groups, MDA, and SAESs. Because agriculturalists serve the consumer we should educate them on their concerns and, if deemed important, on issues identified by agricultural groups.
3. It is necessary to take a critical look at the influence of commodity groups on agriculturally-related research. From the four-stage Delphi it is evident that consumers are not interested in the same issues as commodity groups. Commodity group focus tends to be on economic issues directly related to production, whereas consumer focus is on environmental concerns and education.

### Recommendations

Based on results of the study the following recommendations were made:

1. Further research should be conducted with each critical issue identified by the four-stage Delphi study and a plan developed to address the needs.
2. Because agriculturalist identified issues differ from consumer identified issues, the agricultural community should continually include the consumers in identifying research issues.
3. The agriculturalists need to address the general public's agricultural/natural resources concerns and because agriculturalists serve the consumer we should educate them on their concerns and, if deemed important, on issues identified by agricultural groups. Agricultural education at all levels is one way to address this recommendation.

### Implications

1. Education was listed as an issue by the four-stage Delphi participants. One might argue that this is not a true agricultural issue. However, as more people are removed from production agriculture and fewer people choose to enter agricultural careers, education is an agricultural concern. The agricultural industry needs educated people to continue its growth in biotechnology, genetics, environmental sciences, food science and other high technology areas. Michigan State University and other institutions of higher learning need to work on drawing attention to the opportunities in agriculture. The efforts occurring in high schools and elementary schools must be continued and even be strengthened.
2. Some of the issues with media interests such as animal rights/welfare, acid rain, and greenhouse effect were not identified as



issues by the four-stage Delphi participants. Due to the amount of press the issues receive it was surprising that the participants did not identify these as issues in the first questionnaire. In chapter II, it was discussed that the media is "enormously successful in convincing us what to think about." The lack of priority the respondents gave these issues may be due to the sporadic media coverage they receive. In addition, since these three issues do not directly impact the consumer they may not view them as important as the issues they did rank in the top five.

Agriculturalists, knowing that the media is instrumental in setting consumers' agendas, should use the media to tell their story and educate the consumer on issues they, as consumers, feel are important.

3. The majority of the issues identified by the four-stage Delphi were environmentally related. The only issues that were related specifically to agriculture included food safety, agricultural chemical use, and saving farmland. As a College of Agriculture and Natural Resources there are many opportunities to integrate agriculture and natural resources with the environmental issues. Agriculture has traditionally included a conservation component through the Soil Conservation Service, the Agricultural Stabilization and Conservation Service, and by people within production agriculture following conservation plans. The environmental aspect of agricultural and natural resources should be placed on all agricultural research agendas and be emphasized.

4. Recycling and landfills ranked in the top ten issues as identified by both the three-stage (research-identified issues) and four-stage (consumer-identified issues) Delphi participants. This is not surprising because increasing recycling and decreasing availability of landfills have become household issues. Nonetheless, there were concerns mentioned that recycling isn't needed with every product because certain wastes cannot be redeveloped into another useable

product. This is an excellent opportunity for agricultural and environmental scientists to work on the development of more economic processes that make better use of recycled materials or develop other uses for recycled products. It is not beneficial for consumers to recycle if the waste material cannot be economically re-used.

5. The three-stage (research-identified issues) participants had zero issues that they agreed with at the 100% level whereas the four-stage (consumer-identified) Delphi participants had seven issues that they agreed on at the 100% level. This could be due to the fact that they identified their own issues, unlike the three-stage Delphi where the issues were identified by the review of literature. This could suggest that what agriculturalists feel are important issues do not rank as the consumers' most important issues. Consumers are not currently involved in developing agricultural research agendas, yet they are the people that agriculturalists aim to serve. Agriculturalists need to start including consumers in determining agricultural research agendas.

6. It was surprising that nuclear/chemical wastes and toxic wastes ranked in the top five for the four-stage Delphi participants, it was only identified in one source from the review of literature. As a College of Agriculture and Natural Resources we should investigate further into these areas since they appear to be high on the consumers' issues agenda.

**APPENDIX A**  
**NAMES OF REVIEW COMMITTEE**

## REVIEW COMMITTEE

Dr. Jack Elliot  
Assistant Professor  
Agricultural & Extension Education  
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East Lansing, MI 48824-1039

Mr. David Byrum  
Graduate Assistant  
Agricultural & Extension Education  
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Mr. James Connors  
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Mr. David Krueger  
Graduate Assistant  
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**APPENDIX B**  
**LETTER OF APPROVAL FROM THE MSU COMMITTEE ON**  
**RESEARCH INVOLVING HUMAN SUBJECTS**

OFFICE OF VICE PRESIDENT FOR RESEARCH  
AND DEAN OF THE GRADUATE SCHOOL

EAST LANSING • MICHIGAN • 48824-1046

April 3, 1992

Gwen Dado  
410 Agriculture Hall

RE: MICHIGAN AGRICULTURAL ISSUES, IRB #92-113

Dear Ms. Dado:

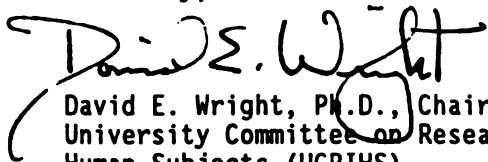
The above project is exempt from full UCRIHS review. The proposed research protocol has been reviewed by a member of the UCRIHS committee. The rights and welfare of human subjects appear to be protected and you have approval to conduct the research.

You are reminded that UCRIHS approval is valid for one calendar year. If you plan to continue this project beyond one year, please make provisions for obtaining appropriate UCRIHS approval one month prior to March 18, 1993.

Any changes in procedures involving human subjects must be reviewed by UCRIHS prior to initiation of the change. UCRIHS must also be notified promptly of any problems (unexpected side effects, complaints, etc.) involving human subjects during the course of the work.

Thank you for bringing this project to my attention. If I can be of any future help, please do not hesitate to let me know.

Sincerely,



David E. Wright, Ph.D., Chair  
University Committee on Research Involving  
Human Subjects (UCRIHS)

DEW/pjm

cc: Dr. Jack Elliot

**APPENDIX C**  
**EXTENDED LISTS**

**Results/Input from Four-stage Delphi Questionnaire #1**  
**MICHIGAN CONSUMER-TYPE ISSUES THAT YOU WOULD LIKE TO SEE ADDRESSED**  
 (Listed according to the amount of interest)

- (12) Water pollution
  - (8) Food safety
  - (7) Landfills
  - (6) Air pollution
  - (5) Michigan economy
  - (4) Drinking water
  - (4) Property taxes (taxes)
  - (4) Recycling
  - (3) Farmland preservation
  - (3) Disposal of nuclear chemical waste
  - (3) Agricultural chemical use
  - (3) Michigan education system
  - (3) State parks
  - (2) Toxic waste
  - (2) Maintenance of Michigan roads
  - (2) Logging of Michigan woodlands
  - (2) Contaminated freshwater fish
  - (1) Use of Michigan land
  - (1) Wetlands
- 
- Issues not selected for questionnaire #1**
- (1) Abandoned oil wells/drill sites
  - (1) Zebra mussels                      (1) Gypsy moths                      (1) Aids issue
  - (2) Abortion rights                      (1) Street people/homelessness
  - (1) Make fair trade act more equitable                      (1) Drug scene
  - (1) Crime                      (1) If DNR will split or separate the fish & wildlife division
  - (1) Unemployment                      (1) High cost of insurance (car, personal, health, property, etc.)
  - (1) Damage to environment by National Guard and Army.
  - (1) Reward people for working and make social programs a source of temporary relief not a way of life.
  - (1) Daycare                      (1) Innercity decay                      (1) Healthcare



Top research issues identified by State Agricultural Experiment Stations (SAESs), and Michigan Department of Agriculture

SAES - 1990's Executive Summary	MDA "Reaching 2020"
<ol style="list-style-type: none"> <li>1. Protecting and enhancing water resources</li> <li>2. Computability of agriculture, natural resources, and environment</li> <li>3. Ensuring food safety</li> <li>4. Pest management strategies</li> <li>5. Biology &amp; management of plant systems</li> <li>6. Improving competitiveness in global markets</li> <li>7. Sustaining forest, range, and related natural resources</li> <li>8. Biological and genetic enhancement of animal efficiency</li> <li>9. Genome mapping and genetic enhancement</li> <li>10. Impacts of new agricultural technologies on environment, people and communities</li> <li>11. Optimal health through improved nutrition</li> <li>12. Animal production systems</li> <li>13. Enhancing composition, nutritional quality, and safety of animal products</li> <li>14. Families, communities, and rural development.</li> <li>15. Developing process for new food and fiber products</li> <li>16. Alternative uses of agricultural products</li> <li>17. Animal health and welfare/well-being</li> <li>18. Ensuring product quality and safety</li> <li>19. Understanding dietary patterns and food consumer behaviors</li> </ol>	<ol style="list-style-type: none"> <li>1. Integrated pest management</li> <li>2. Alternative agriculture systems</li> <li>3. Biotechnology</li> <li>4. Reforestation</li> <li>5. Food safety</li> <li>6. Animal waste</li> <li>7. Health impacts of consumer food choices</li> <li>8. Packaging safety</li> <li>9. Recyclable and biodegradable packaging</li> <li>10. Solid waste disposal</li> <li>11. Sustainable farming practices</li> <li>12. Toxic and hazardous waste disposal</li> </ol>

**APPENDIX D**  
**COVER LETTERS AND QUESTIONNAIRES**  
**THREE-STAGE DELPHI**

April 3, 1992

1-

Dear 2-:

We would like your assistance in helping to define important consumer-type issues facing Michigan people. You are one of only fifty (50) people in Michigan who will be asked to help us in this study. We hope that you will take time to read this letter, become familiar with what we want to do and indicate your acceptance on the enclosed self-addressed, stamped postcard. Following are some questions and answers that will help you make your choice.

1.     **What will you be asked to do?**  
You will be asked to respond to three (3) surveys that move from many issues down to a few critical consumer-type issues.
2.     **How long will it take?**  
The study will take approximately six (6) weeks, including mail time.
3.     **Is there any expense to you?**  
No. All surveys will include stamped return envelopes. Your time is what we need.
4.     **Will your name be used?**  
Your name will not be used in any part of the study. The study insures confidentiality.
5.     **What will you receive from this study?**  
You will receive a final copy of the results upon request. More importantly, you will know you have helped identify the concerns of Michigan people.
6.     **How will this information be used?**  
The most important issues will become high priority items for future study.

We hope you will accept this privilege of identifying Michigan issues. Please return the enclosed postcard with your answer. We anxiously await your reply. If we do not receive your postcard we will contact you during the evening of March 25 or 26, 1992. Please contact us if you have any questions.

Thank you for taking time to read this letter and hopefully for participating in this study.

Sincerely,

Jack Elliot  
Project Director

Gwen Dado  
Graduate Assistant

March 18, 1992

Dear:

Please use this card to indicate your choice for participation in the study.

Please circle your answer.

YES            I want to help identify issues that concern the people of Michigan.

NO             I do not want to help identify issues that concern the people of Michigan.

If we do not receive this postcard we will call you during the evening of March 25 or 26, 1992.

April 3, 1992

1-

Dear 2-:

Thank you for agreeing to participate in this study to determine issues that are important to the people of Michigan. Please complete the enclosed survey and return it within one day of receiving it. Please use the enclosed self-addressed-stamped envelope to return the survey.

The issues listed in this survey were chosen because they appeared in several research articles as being important. The final results will be shared with you upon request.

You will receive two (2) more updated versions of this survey during April and May. This study uses several rounds of mailing surveys, reviewing responses, developing updated versions of the survey and mailing them out again to get the group's opinions and ideas. It is very important that you return your survey immediately. This immediate response allows us to look at results and prepare the next updated version of the survey.

If you have a different address where you would like the next versions of the survey mailed please contact Diane Verlinda or us at (517) 355-6580. Do not include your address with the survey because we want to maintain confidentiality.

Thank you for helping with this study on important issues facing the people of Michigan. You indicate your voluntary agreement to participate by completing and returning this questionnaire. Please contact us if you have any questions.

Sincerely,

Jack Elliot  
Project Director

Gwen Dado  
Graduate Assistant

## Michigan Issues - Survey #1

**RETURN IMMEDIATELY**

The following list of items were identified by us as the most important consumer-type issues facing the people of Michigan. Please indicate how important you feel the item is by circling the correct number. Please add a comment stating your beliefs about the issue in the space provided.

Levels of importance:           1 = Not important  
                                   2 = Low importance  
                                   3 = Very important  
                                   4 = Extremely important

(circle the response)

- |         |     |   |
|---------|-----|---|
| 1 2 3 4 | 1.  | Food safety. Comments: _____  |
|         |     | _____   |
| 1 2 3 4 | 2.  | Greenhouse effect. Comments: _____  |
|         |     | _____   |
| 1 2 3 4 | 3.  | Clean air. Comments: _____  |
|         |     | _____   |
| 1 2 3 4 | 4.  | Groundwater. Comments: _____  |
|         |     | _____   |
| 1 2 3 4 | 5.  | Property taxes. Comments: _____   |
|         |     | _____   |
| 1 2 3 4 | 6.  | Landfills: Comments: _____  |
|         |     | _____   |
| 1 2 3 4 | 7.  | Use of Michigan land (examples: forests, state parks, shorelines, etc.) Comments: _____ |
|         |     | _____   |
| 1 2 3 4 | 8.  | Acid rain. Comments: _____  |
|         |     | _____   |
| 1 2 3 4 | 9.  | Attracting tourists. Comments: _____  |
|         |     | _____   |
| 1 2 3 4 | 10. | Lawn pesticide use. Comments: _____   |
|         |     | _____   |
| 1 2 3 4 | 11. | Agricultural pesticide use. Comments: _____   |

\_\_\_\_\_ (turn over)

## Levels of importance:

- 1 = Not important  
 2 = Low importance  
 3 = Very important  
 4 = Extremely important

(circle the response)

- 1 2 3 4    12.    Organic farming.    Comments: \_\_\_\_\_  
 \_\_\_\_\_
- 1 2 3 4    13.    Genetic engineering.    Comments: \_\_\_\_\_  
 \_\_\_\_\_
- 1 2 3 4    14.    International food trade.    Comments: \_\_\_\_\_  
 \_\_\_\_\_
- 1 2 3 4    15.    Recycling.    Comments: \_\_\_\_\_  
 \_\_\_\_\_
- 1 2 3 4    16.    Understanding how food moves from producer to your  
 table.    Comments: \_\_\_\_\_  
 \_\_\_\_\_
- 1 2 3 4    17.    Disposal of animal wastes as it relates to food  
 production    Comments: \_\_\_\_\_  
 \_\_\_\_\_
- 1 2 3 4    18.    Animal rights/welfare.    Comments: \_\_\_\_\_  
 \_\_\_\_\_
- 1 2 3 4    19.    Saving farmland.    Comments: \_\_\_\_\_  
 \_\_\_\_\_
- 1 2 3 4    20.    Wetlands.    Comments: \_\_\_\_\_  
 \_\_\_\_\_

April 15, 1992

1~

Dear 2~:

The response to the first Michigan Issues survey was outstanding. Please take a few more minutes and complete the enclosed second survey and return it in the enclosed self-addressed stamped envelope within one day of receiving it, if at all possible.

The purpose of this survey is to explore the disagreements that developed in the first questionnaire and continue narrowing down to a few critical issues.

Thank you for participating in the second step of this process. Your final questionnaire will be mailed April 29, 1992. Please contact us if you have any questions.

Sincerely,

Jack Elliot  
Project Director

Gwen Dado  
Graduate Assistant



The following issues facing Michigan people are listed in order of importance. The order was determined by individuals who responded to the first survey. However the comments revealed differing views of why each item was important. The purpose of this questionnaire is to determine the extent of agreement and disagreement among respondents of each issue. Please indicate your level of agreement or disagreement by circling the appropriate number. If needed, please add a comment to clarify your response.

\*\*\* = most respondents indicated this issue was very important.  
\*\* = most respondents indicated this issue was not important.

(turn over)

Levels of agreement:           1 = Strongly disagree  
                                   2 = Disagree  
                                   3 = Agree  
                                   4 = Strongly agree

(circle the appropriate response)

- 1 2 3 4      8.\*\*\* Michigan farmers should decrease their use of pesticides. Comments: \_\_\_\_\_
- \_\_\_\_\_
- 1 2 3 4      9.\*\*\* Michigan needs to increase efforts to promote tourism. Comments: \_\_\_\_\_
- \_\_\_\_\_
- 1 2 3 4      10.\*\*\* Lawn owners should decrease their use of pesticides/fertilizers. Comments: \_\_\_\_\_
- \_\_\_\_\_
- 1 2 3 4      11.\*\* It is important to maintain Michigan lands (forests, state parks, shorelines, etc.) as natural sites of beauty for Michigan natives and tourists. Comments: \_\_\_\_\_
- \_\_\_\_\_
- 1 2 3 4      12.\*\* Wetlands need to be protected and preserved because they are needed for the survival of wildlife. Comments: \_\_\_\_\_
- \_\_\_\_\_
- 1 2 3 4      13\*\* Educational programs should be created to inform consumers about how food is produced. Comments: \_\_\_\_\_
- \_\_\_\_\_
- 1 2 3 4      14.\*\* The Greenhouse effect is an overblown issue. Comments: \_\_\_\_\_
- \_\_\_\_\_
- 1 2 3 4      15.\*\* International food trade is important to all nations' economies. Comments: \_\_\_\_\_
- \_\_\_\_\_
- 1 2 3 4      16.\*\* Animal wastes should be used only on crops grown for animal consumption. Comments: \_\_\_\_\_
- \_\_\_\_\_

(turn over)

Levels of agreement:           1 = Strongly disagree  
                                  2 = Disagree  
                                  3 = Agree  
                                  4 = Strongly agree

(circle the appropriate response)

1 2 3 4      17.\*\* Acid rain is not a problem in Michigan.   Comments:

\_\_\_\_\_  
\_\_\_\_\_

1 2 3 4      18.\*\* Organic farming is difficult to do on a large scale.  
                  Comments: \_\_\_\_\_

\_\_\_\_\_ (next page)

1 2 3 4      19.\*\* Animals need to be respected however, we need to  
                  stress human rights over animal rights.   Comments:

\_\_\_\_\_  
\_\_\_\_\_

1 2 3 4      20.\*\* People need to be better informed about genetic  
                  engineering.   Comments: \_\_\_\_\_

\_\_\_\_\_

April 29, 1992

1-

Dear 2-:

This is the last Michigan Issues questionnaire. Please take a few minutes and complete the enclosed form and return it to me in the enclosed self-addressed stamped envelope within one day of receiving it, if at all possible.

The purpose of this final questionnaire is to reach consensus on the important issues facing Michigan consumers. The response to the first two questionnaires has been great! We appreciate your previous assistance and encourage you to participate in the process one last time.

If you would like a copy of the final report please contact Diane Verlinde at the address or phone number listed on this letter. We will mail copies in July. Please contact us if you have any questions. Thank you for helping with this study on important issues facing the people of Michigan.

Sincerely,

Jack Elliot  
Project Director

Gwen Dado  
Graduate Assistant

The following Michigan issues facing Michigan people are listed in order of importance as determined by individuals who responded to the first Michigan Issues questionnaire. The percent of respondents who agreed or disagreed with the issue is listed in parenthesis above the response numbers. For example, 0% of the respondents strongly disagreed or disagreed with statement number 1 and 100% of the respondents strongly agreed or agreed with statement number 1.

**Levels of agreement:**

1 = I disagree with the statement.  
2 = I agree with the statement.

Dis. Agree

**1**                      **2**

1

**2**

1.\*\*\* Farmland must be preserved in order to have food now and in the future. Comments:

1

2

**2.\*\*\* Property tax reform should be introduced.**  
**Comments:**

1

**2**

3.\*\* Food safety should be improved even if it means higher food prices. Comments:

1

**2**

4.\*\* It is important to maintain Michigan lands (forests, state parks, shorelines, etc.) as natural sites of beauty for Michigan natives and tourists. Comments:

1

2

5.\*\* Groundwater quality may be a more serious problem than currently believed because of insufficient knowledge. Comments:

1

## 2

6.\*\* Michigan should increase air quality through government regulation. Comments:

2

2

7.\*\* Recycling programs within Michigan should be more uniform. Comments:

**(turn over)**

Levels of agreement:            1 = I disagree with the statement.  
                                      2 = I agree with the statement.

(circle the appropriate response)

Dis.    Agree

(8%)    (92%)

1        2

8.\*\* Michigan should research possible permanent  
 alternatives to landfills    Comments: \_\_\_\_\_

(31%) (69%)

1        2

9.\*\* Michigan needs to increase efforts to promote  
 tourism.    Comments: \_\_\_\_\_

(31%) (69%)

1        2

10.\*\* Michigan farmers should decrease their use of  
 pesticides.    Comments: \_\_\_\_\_

(54%) (46%)

1        2

11.\*\* Educational programs should be created to inform  
 consumers about how food is produced.    Comments: \_\_\_\_\_

(36%) (64%)

1        2

12.\*\* Organic farming could be accomplished on a large  
 scale.    Comments: \_\_\_\_\_

(38%) (62%)

1        2

13.\*\* The Greenhouse effect is an issue of concern in  
 Michigan.    Comments: \_\_\_\_\_

(31%) (69%)

1        2

14.\*\* Lawn owners should decrease their use of  
 pesticides/fertilizers.    Comments: \_\_\_\_\_

(75%) (25%)

1        2

15.\* Animal wastes should be used only on crops grown  
 for animal consumption.    Comments: \_\_\_\_\_

(23%) (77%)

1        2

16.\* Wetlands need to be protected and preserved  
 because they are needed for the survival of  
 wildlife.    Comments: \_\_\_\_\_

(23%) (77%)

1        2

17.\* International food trade is important to all  
 nations' economies.    Comments: \_\_\_\_\_

(next page)

\*\* = very important issue

\* = low importance issue

Levels of agreement:           1 = I disagree with the statement  
                                   2 = I agree with the statement

(circle the appropriate response)

Dis.   Agree  
 (25%) (75%)  
       1       2

18.\* People need to better informed about genetic engineering. Comments: \_\_\_\_\_

\_\_\_\_\_

(17%) (83%)  
       1       2

19.\* Animals need to be respected however, we need to stress human rights over animal rights. Comments: \_\_\_\_\_

\_\_\_\_\_

(15%) (85%)  
       1       2

20.\* Acid rain is a concern in Michigan. Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\* = low importance issue

**APPENDIX E**  
**COVER LETTERS AND QUESTIONNAIRES**  
**FOUR-STAGE DELPHI**



April 3, 1992

1-

Dear 2-:

We would like your assistance in helping to define important consumer-type issues facing Michigan people. You are one of only fifty (50) people in Michigan who will be asked to help us in this study. We hope that you will take time to read this letter, become familiar with what we want to do and indicate your acceptance on the enclosed self-addressed, stamped postcard. Following are some questions and answers that will help you make your choice.

1.     What will you be asked to do?  
You will be asked to respond to four (4) surveys that move from many issues down to a few critical consumer-type issues.
2.     How long will it take?  
The study will take approximately six (6) weeks, including mail time.
3.     Is there any expense to you?  
No. All surveys will include stamped return envelopes. Your time is what we need.
4.     Will your name be used?  
Your name will not be used in any part of the study. The study insures confidentiality.
5.     What will you receive from this study?  
You will receive a final copy of the results upon request. More importantly, you will know you have helped identify the concerns of Michigan people.
6.     How will this information be used?  
The most important issues will become high priority items for future study.

We hope you will accept this privilege of identifying Michigan issues. Please return the enclosed postcard with your answer. We anxiously await your reply. If we do not receive your postcard we will contact you during the evening of March 25 or 26, 1992. Please contact us if you have any questions.

Thank you for taking time to read this letter and hopefully for participating in this study.

Sincerely,

Jack Elliot  
Project Director

Gwen Dado  
Graduate Assistant

March 18, 1992

Dear:

Please use this card to indicate your choice for participation in the study.

Please circle your answer.

**YES**            I want to help identify issues that concern the people of Michigan.

**NO**             I do not want to help identify issues that concern the people of Michigan.

If we do not receive this postcard we will call you during the evening of March 25 or 26, 1992.

April 3, 1992

1-

Dear 2-:

Thank you for agreeing to participate in this study to determine issues that are important to the people of Michigan. Please complete the enclosed survey and return it within one day of receiving it. Please use the enclosed self-addressed-stamped envelope to return the survey.

You will receive three (3) more updated versions of this survey during April and May. This study uses several rounds of mailing surveys, reviewing responses, developing updated versions of the survey and mailing them out again to get the group's opinions and ideas. It is very important that you return your survey immediately. This immediate response allows us to look at results and prepare the next updated version of the survey.

If you have a different address where you would like the next versions of the survey mailed please contact Diane Verlinde or us at (517) 355-6580. Do not include your address with the survey because we want to maintain confidentiality.

Thank you for helping with this study on important issues facing the people of Michigan. You indicate your voluntary agreement to participate by completing and returning this questionnaire. Please contact us if you have any questions.

Sincerely,

Jack Elliot  
Project Director

Gwen Dado  
Graduate Assistant

## Michigan Issues

## Survey #1

**RETURN IMMEDIATELY**

**Responsibility:** Identify the concerns of Michigan people as they relate to the environment/out-of-doors, the food you eat and how it is produced, the use of Michigan land, pollution, etc.

**Procedure:**

The study is conducted through several rounds of mail questionnaires. The ideas generated will allow us to move from many issues down to a few critical issues. These ideas will be used for further studies.

1. Please list at least five issues that you think are consumer-type concerns of the people of Michigan.

a.

b.

c.

d.

e.

f.

g.

h.

i.

j.

April 15, 1992

1-

Dear 2-:

The response to the first Michigan Issues survey was outstanding. Please take a few more minutes and complete the enclosed second survey and return it in the enclosed self-addressed stamped envelope within one day of receiving it, if at all possible.

The purpose of this survey is to explore the issues that developed in the first questionnaire and continue narrowing down to a few critical concerns.

Thank you for participating in the second step of this process. Your next questionnaire will be mailed April 29, 1992. Please contact us if you have any questions.

Sincerely,

Jack Elliot  
Project Director

Gwen Dado  
Graduate Assistant

## Michigan Issues - Survey #2

**RETURN IMMEDIATELY**

The following list of items were identified by the respondents to Survey # 1 as the most important issues facing Michigan consumers. Please indicate how important you feel the item is by circling the appropriate number. Please add a comment indicating your beliefs about each item in the space provided.

Levels of importance:           1 = Not important  
                                   2 = Low importance  
                                   3 = Very important  
                                   4 = Extremely important

(circle the appropriate response)

- |         |     |   |                 |
|---------|-----|---|-----------------|
| 1 2 3 4 | 1.  | Water pollution.                        | Comments: _____ |
|         |     |   | _____           |
| 1 2 3 4 | 2.  | Food safety.                            | Comments: _____ |
|         |     |   | _____           |
| 1 2 3 4 | 3.  | Landfills.                              | Comments: _____ |
|         |     |   | _____           |
| 1 2 3 4 | 4.  | Air pollution.                          | Comments: _____ |
|         |     |   | _____           |
| 1 2 3 4 | 5.  | Michigan economy.                       | Comments: _____ |
|         |     |   | _____           |
| 1 2 3 4 | 6.  | Drinking water.                         | Comments: _____ |
|         |     |   | _____           |
| 1 2 3 4 | 7.  | Property taxes.                         | Comments: _____ |
|         |     |   | _____           |
| 1 2 3 4 | 8.  | Recycling.                              | Comments: _____ |
|         |     |   | _____           |
| 1 2 3 4 | 9.  | Agricultural chemical use.              | Comments: _____ |
|         |     |   | _____           |
| 1 2 3 4 | 10. | Disposal of nuclear and chemical waste. | Comments: _____ |
|         |     |   | _____           |
| 1 2 3 4 | 11. | Saving Farmland.                        | Comments: _____ |
|         |     |   | _____           |

(turn over)

Levels of importance:      1 = Not important  
                                 2 = Low importance  
                                 3 = Very important  
                                 4 = Extremely important

(circle the appropriate response)

- 1 2 3 4      12.    Michigan education system.      Comments: \_\_\_\_\_  
                                 \_\_\_\_\_
- 1 2 3 4      13.    State parks.      Comments: \_\_\_\_\_  
                                 \_\_\_\_\_
- 1 2 3 4      14.    Toxic waste.      Comments: \_\_\_\_\_  
                                 \_\_\_\_\_
- 1 2 3 4      15.    Maintenance of Michigan roads.      Comments: \_\_\_\_\_  
                                 \_\_\_\_\_
- 1 2 3 4      16.    Logging of Michigan woodlands.      Comments: \_\_\_\_\_  
                                 \_\_\_\_\_
- 1 2 3 4      17.    Contaminated freshwater fish.      Comments: \_\_\_\_\_  
                                 \_\_\_\_\_
- 1 2 3 4      18.    Use of Michigan land.      Comments: \_\_\_\_\_  
                                 \_\_\_\_\_
- 1 2 3 4      19.    Wetlands.      Comments: \_\_\_\_\_  
                                 \_\_\_\_\_
- 1 2 3 4      20.    Abandoned oil wells/drill sites.      Comments: \_\_\_\_\_  
                                 \_\_\_\_\_
- 1 2 3 4      21.    Any other issue(s) that you feel needs to be addressed  
                                 during the next mailing.      Comments: \_\_\_\_\_  
                                 \_\_\_\_\_  
                                 \_\_\_\_\_

April 29, 1992

1-

Dear 2-:

The response to the second Michigan Issues survey was great. Please take a few more minutes and complete the enclosed third survey and return it in the enclosed self-addressed stamped envelope within one day of receiving it, if at all possible.

The purpose of this survey is to explore the disagreements that developed in the second questionnaire and continue narrowing down to a few critical issues.

Thank you for participating in the third step of this process. Your final questionnaire will be mailed May 12, 1992. Please contact us if you have any questions.

Sincerely,

Jack Elliot  
Project Director

Gwen Dado  
Graduate Assistant



## Michigan Issues - Survey #3

**RETURN IMMEDIATELY**

The following issues facing Michigan people are listed in order of importance. The order was determined by individuals who responded to the second survey. However, the comments revealed differing views ON why each item was important. The purpose of this questionnaire is to determine the extent of agreement and disagreement among respondents of each issue. Please indicate your level of agreement or disagreement by circling the appropriate number. If needed, please add a comment to clarify your response.

Levels of agreement:           1 = Strongly disagree  
                                   2 = Disagree  
                                   3 = Agree  
                                   4 = Strongly agree

(circle the appropriate response)

- |         |   |
|---------|---|
| 1 2 3 4 | 1.*** Michigan can be proud of its kindergarten through twelfth grade educational system.<br>Comments: _____<br>_____                     |
| 1 2 3 4 | 2.*** Processes that generate nuclear wastes should be banned because the wastes cannot be disposed of properly. Comments: _____<br>_____ |
| 1 2 3 4 | 3.** Recycling programs within Michigan should be more uniform.       Comments: _____<br>_____  |
| 1 2 3 4 | 4.** Michigan should research possible permanent alternatives to landfills. Comments: _____<br>_____                                      |
| 1 2 3 4 | 5.** The methods of toxic waste disposal are adequate; the problem lies with communication. Comments: _____<br>_____                      |
| 1 2 3 4 | 6.** Currently, Michigan has good, pure drinking water. Comments: _____<br>_____  |
| 1 2 3 4 | 7.** The water pollution we acknowledge is only a small part of the real problem. Comments: _____<br>_____                                |

\*\*\* = extremely important issue   \*\* = very important issue  
(turn over)

**Levels of agreement:**

- 1 = Strongly disagree  
 2 = Disagree  
 3 = Agree  
 4 = Strongly agree

(circle the appropriate response)

- 1 2 3 4      8.\*\* Michigan's economy must begin to rely on other areas besides the automobile industry.  
 Comments: \_\_\_\_\_
- 1 2 3 4      9.\*\* Property tax reform measures should be introduced. Comments: \_\_\_\_\_
- 1 2 3 4      10.\*\* Farmland must be preserved in order to have food now and in the future. Comments: \_\_\_\_\_
- 1 2 3 4      11.\*\* Well maintained roads are worth paying for.  
 Comments: \_\_\_\_\_
- 1 2 3 4      12.\*\* Sources of pollution which contaminate our freshwater fish must be found and stopped.  
 Comments: \_\_\_\_\_
- 1 2 3 4      13.\*\* Wetlands need to be protected and preserved because they are needed for the survival of wildlife. Comments: \_\_\_\_\_
- 1 2 3 4      14.\*\* Michigan should increase air quality through government regulation. Comments: \_\_\_\_\_
- 1 2 3 4      15.\*\* Current food safety standards meet consumers' needs. Comments: \_\_\_\_\_
- 1 2 3 4      16.\*\* Michigan farmers should decrease their use of agricultural chemicals. Comments: \_\_\_\_\_
- 1 2 3 4      17.\*\* Michigan land usage should be based on well developed plans. Comments: \_\_\_\_\_

\*\* = very important

(next page)

Levels of agreement:           1 = Strongly disagree  
                                  2 = Disagree  
                                  3 = Agree  
                                  4 = Strongly agree

(circle the appropriate response)

1 2 3 4           18.\*\* Intense logging is sound if replanting is  
adequate. Comments: \_\_\_\_\_

1 2 3 4           19.\*\* Abandoned oil well/drill sites should be  
restored to their undisturbed state. Comments: \_\_\_\_\_

1 2 3 4           20.\* Because of their importance, the quality of  
Michigan state parks is the responsibility of  
all Michigan people. Comments: \_\_\_\_\_

\*\* = very important issue  
\* = low importance issue

May 12, 1992

1-

Dear 2-:

This is the last Michigan Issues questionnaire. Please take a few minutes and complete the enclosed form and return it to me in the enclosed self-addressed stamped envelope within one day of receiving it, if at all possible.

The purpose of this final questionnaire is to reach consensus on the important issues facing Michigan consumers. The response to the first three questionnaires has been great! We appreciate your previous assistance and encourage you to participate in the process one last time.

If you would like a copy of the final report please contact Diane Verlinda at the address or phone number listed on this letter. We will mail copies in July. Please contact us if you have any questions. Thank you for helping with this study on important issues facing the people of Michigan.

Sincerely,

Jack Elliot  
Project Director

Gwen Dado  
Graduate Assistant

## Michigan Issues - Survey #4

**RETURN IMMEDIATELY**

The following Michigan issues facing Michigan people are listed in order of importance as determined by individuals who responded to the second Michigan Issues questionnaire. The percent of respondents who agreed or disagreed with the issue from the third Michigan Issues questionnaire is listed in the parentheses above the numbers. For example, 56% of the respondents strongly disagreed or disagreed with statement number 1 and 44% of the respondents strongly agreed or agreed with statement number 1.

The purpose of this questionnaire is to reach consensus on each issue. Please indicate whether you agree or disagree with the statement by circling the appropriate number. If needed, please add a comment to clarify your response.

Levels of agreement:                    1 = I disagree with the statement.  
   2 = I agree with the statement.

(circle the appropriate response)

**Disagree**      **Agree**  
(56%) (44%)  
1                2

1.\*\*\* Michigan can be proud of its kindergarten through twelfth grade educational system. Comments: \_\_\_\_\_

(67%) (33%)  
1                2

2.\*\*\* Processes that generate nuclear wastes should be banned because the wastes cannot be disposed of properly. Comments: \_\_\_\_\_

(0%) (100%)  
1                2

3.\*\* Recycling programs within Michigan should be more uniform. Comments: \_\_\_\_\_

(6%) (94%)  
1                2

4.\*\* Michigan should research possible permanent alternatives to landfills. Comments: \_\_\_\_\_

(69%) (31%)  
1                2

5.\*\* The methods of toxic waste disposal are adequate; the problem lies with communication. Comments: \_\_\_\_\_

(44%) (56%)  
1                2

6.\*\* Currently, Michigan has good, pure drinking water. Comments: \_\_\_\_\_

(turn over)

\*\*\* = extremely important issue

\*\* = very important issue

Levels of agreement: 1 = I disagree with the statement.  
2 = I agree with the statement.

(circle the appropriate response)

Disagree      Agree

(6%)      (94%)

1

2

7.\*\* The water pollution we acknowledge is only a small part of the real problem. Comments: \_\_\_\_\_

(0%)      (100%)

1

2

8.\*\* Michigan's economy must begin to rely on other areas besides the automobile industry. Comments: \_\_\_\_\_

(12%)      (88%)

1

2

9.\*\* Property tax reform measures should be introduced. Comments: \_\_\_\_\_

(12%)      (88%)

1

2

10.\*\* Farmland must be preserved in order to have food now and in the future. Comments: \_\_\_\_\_

(0%)      (100%)

1

2

11.\*\* Well maintained roads are worth paying for. Comments: \_\_\_\_\_

(0%)      (100%)

1

2

12.\*\* Sources of pollution which contaminate our freshwater fish must be found and stopped. Comments: \_\_\_\_\_

(13%)      (87%)

1

2

13.\*\* Wetlands need to be protected and preserved because they are needed for the survival of wildlife. Comments: \_\_\_\_\_

(27%)      (73%)

1

2

14.\*\* Michigan should increase air quality through government regulation. Comments: \_\_\_\_\_

(31%)      (69%)

1

2

15.\*\* Current food safety standards meet consumers' needs. Comments: \_\_\_\_\_

(20%)      (80%)

1

2

16.\*\* Michigan farmers should decrease their use of agricultural chemicals. Comments: \_\_\_\_\_

(next page)

\*\* very important issue

Levels of agreement: 1 = I disagree with the statement.  
2 = I agree with the statement.

(circle the appropriate response)

Disagree      Agree  
(0%)      (100%)

1      2

17.\*\* Michigan land usage should be based on well developed plans. Comments: \_\_\_\_\_

(50%) (50%)

1      2

18.\*\* Intense logging is sound if replanting is adequate. Comments: \_\_\_\_\_

(0%) (100%)

1      2

19.\*\* Abandoned oil well/drill sites should be restored to their undisturbed state. Comments: \_\_\_\_\_

(19%) (81%)

1      2

20.\* Because of their importance, the quality of Michigan state parks is the responsibility of all Michigan people. Comments: \_\_\_\_\_

\*\* = very important issue

\* = low importance issue

**APPENDIX F**  
**SUPPLEMENTAL DATA ANALYSIS**  
**THREE-STAGE DELPHI**



**Michigan Issues  
Three-stage Delphi - Questionnaire #1**

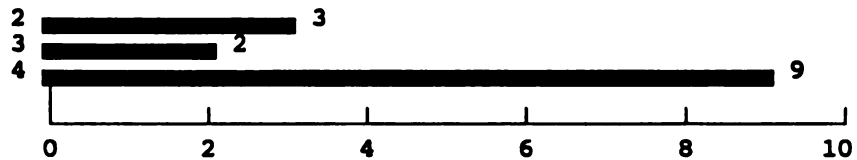
The "Average" values listed below are based on the following four point Likert scale.

Levels of importance:      1 = Not important  
                                      2 = Low importance  
                                      3 = Very important  
                                      4 = Extremely important

**1. Food safety.**

Average 3.43

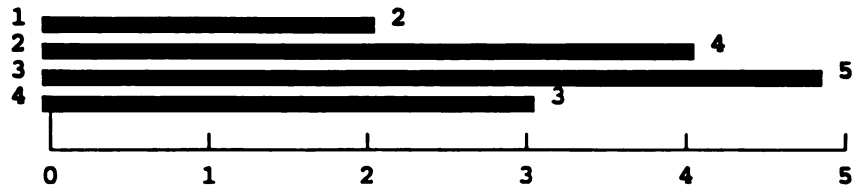
Value Label	Frequency	Percent
Low importance	3	21.4
Very important	2	14.3
Extremely important	9	64.3
	-----	-----
Total	14	100.0



**2. Greenhouse effect.**

Average 2.64

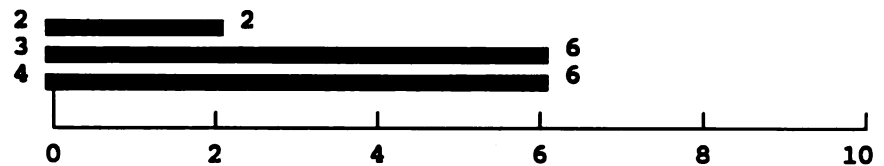
Value Label	Value	Frequency	Percent
Not important	1	2	14.3
Low importance	2	4	28.6
Very important	3	5	35.7
Extremely important	4	3	21.4
		-----	-----
Total		14	100.0



## 3. Clean air.

Average 3.29

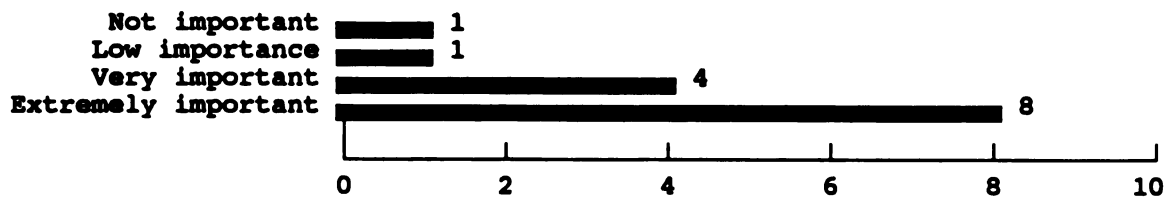
Value Label	Value	Frequency	Percent
Low importance	2	2	14.3
Very important	3	6	42.9
Extremely important	4	6	42.9
		-----	-----
Total		14	100.0



## 4. Groundwater.

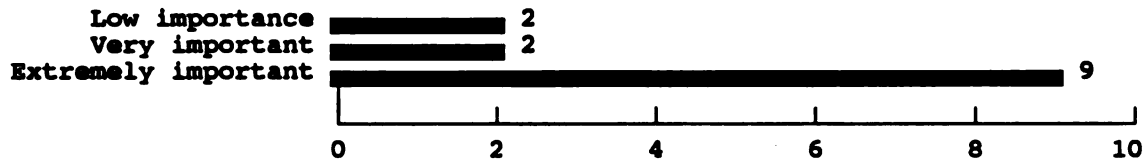
Average 3.36

Value Label	Value	Frequency	Percent
Not important	1	1	7.1
Low importance	2	1	7.1
Very important	3	4	28.6
Extremely important	4	8	57.1
		-----	-----
Total		14	100.0

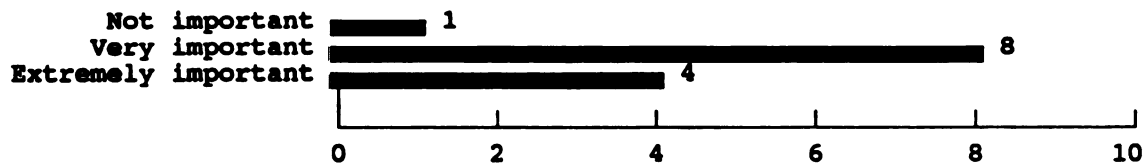


**5. Property taxes.****Average 3.54**

Value Label	Value	Frequency	Percent
Low importance	2	2	15.4
Very important	3	2	15.4
Extremely important	4	9	69.2
		-----	-----
Total		13	100.0

**6. Landfills.****Average 3.15**

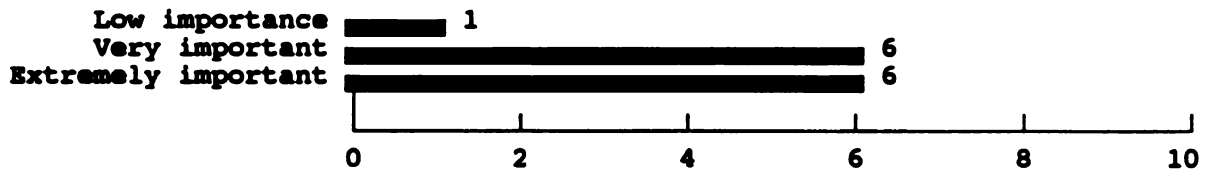
Value Label	Value	Frequency	Percent
Not important	1	1	7.7
Very important	3	8	61.5
Extremely important	4	4	30.8
		-----	-----
Total		13	100.0



7. Use of Michigan land (examples: forests, state parks, shoreline, etc.).

Average 3.38

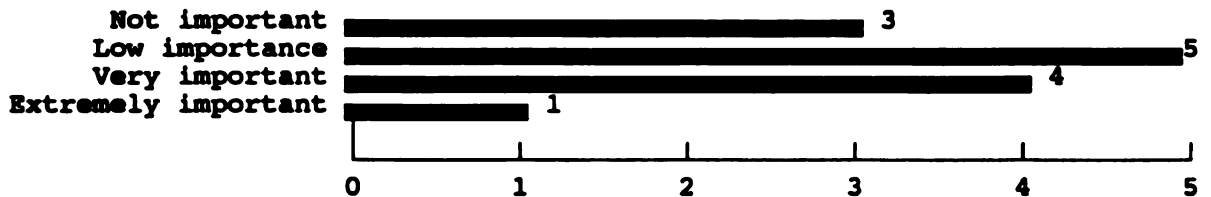
Value Label	Value	Frequency	Percent
Low importance	2	1	7.7
Very important	3	6	46.2
Extremely important	4	6	46.2
		-----	-----
Total		13	100.0



8. Acid rain.

Average 2.23

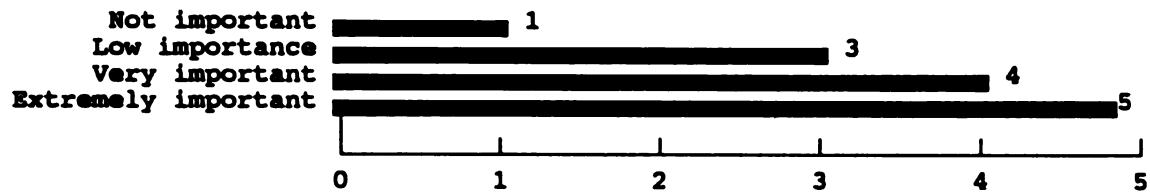
Value Label	Value	Frequency	Percent
Not important	1	3	23.1
Low importance	2	5	38.5
Very important	3	4	30.8
Extremely important	4	1	7.7
		-----	-----
Total		13	100.0



## 9. Attracting tourists.

Average 3.00

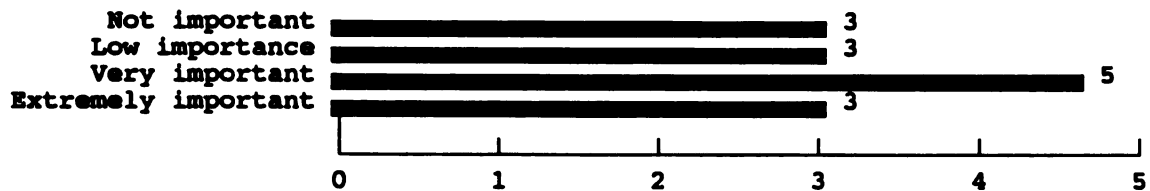
Value Label	Value	Frequency	Percent
Not important	1	1	7.7
Low importance	2	3	23.1
Very important	3	4	30.8
Extremely important	4	5	38.5
		-----	-----
Total		13	100.0



## 10. Lawn pesticide use.

Average 2.57

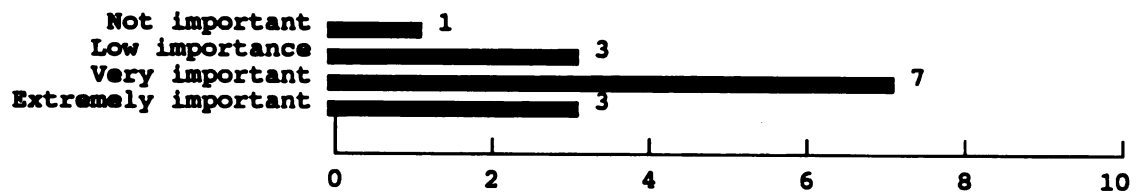
Value Label	Value	Frequency	Percent
Not important	1	3	21.4
Low importance	2	3	21.4
Very important	3	5	35.7
Extremely important	4	3	21.4
		-----	-----
Total		14	100.0



## 11. Agricultural pesticide use.

Average 2.86

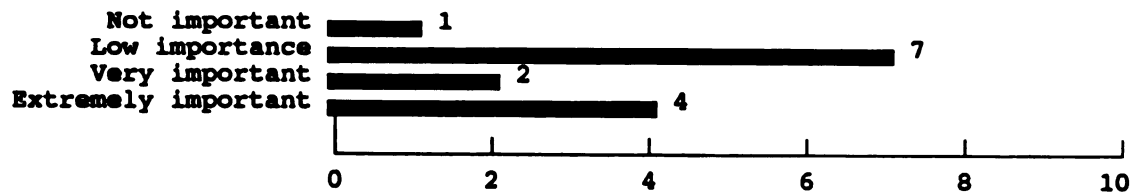
Value Label	Value	Frequency	Percent
Not important	1	1	7.1
Low importance	2	3	21.4
Very important	3	7	50.0
Extremely important	4	3	21.4
		-----	-----
Total		14	100.0



## 12. Organic farming.

Average 2.64

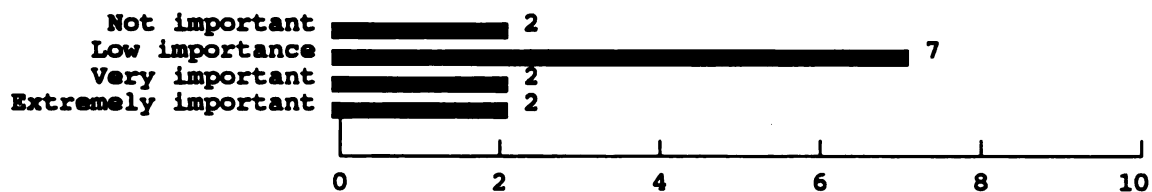
Value Label	Value	Frequency	Percent
Not important	1	1	7.1
Low importance	2	7	50.0
Very important	3	2	14.3
Extremely important	4	4	28.6
		-----	-----
Total		14	100.0



## 13. Genetic engineering.

Average 2.31

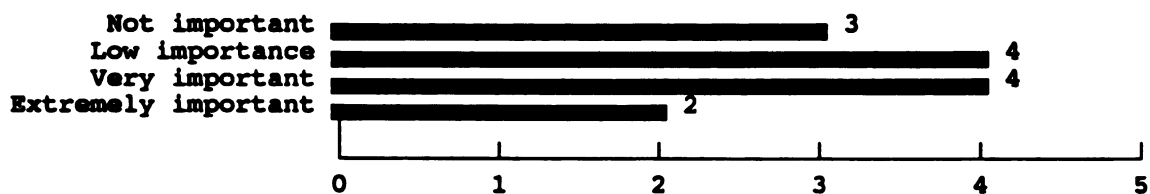
Value Label	Value	Frequency	Percent
Not important	1	2	15.4
Low importance	2	7	53.8
Very important	3	2	15.4
Extremely important	4	2	15.4
		-----	-----
	Total	13	100.0



## 14. International food trade.

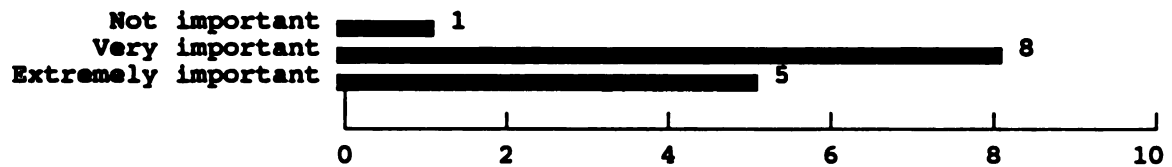
Average 2.38

Value Label	Value	Frequency	Percent
Not important	1	3	23.1
Low importance	2	4	30.8
Very important	3	4	30.8
Extremely important	4	2	15.4
		-----	-----
	Total	13	100.0

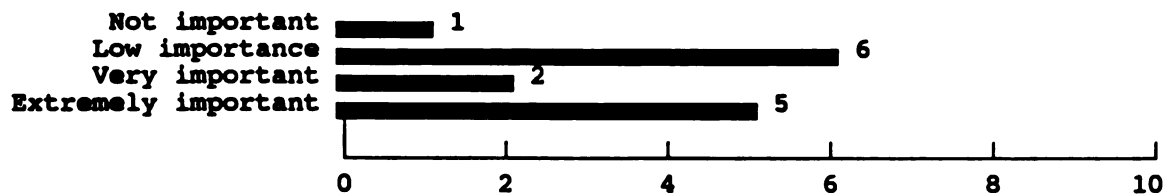


**15. Recycling.****Average 3.21**

Value Label	Value	Frequency	Percent
Not important	1	1	7.1
Very important	3	8	57.1
Extremely important	4	5	35.7
		-----	-----
Total		14	100.0

**16. Understanding how food moves from producer to your table.****Average 2.79**

Value Label	Value	Frequency	Percent
Not important	1	1	7.1
Low importance	2	6	42.9
Very important	3	2	14.3
Extremely important	4	5	35.7
		-----	-----
Total		14	100.0

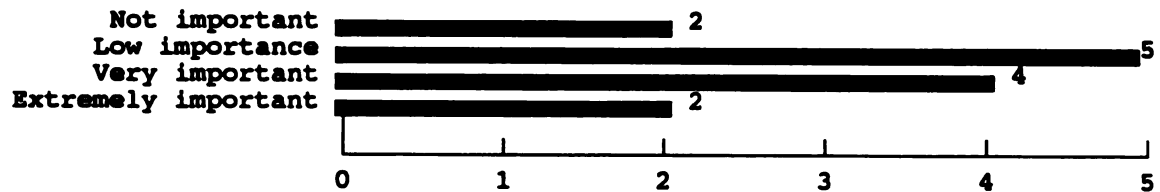




**17. Disposal of animal wastes as it relates to food production.**

**Average 2.46**

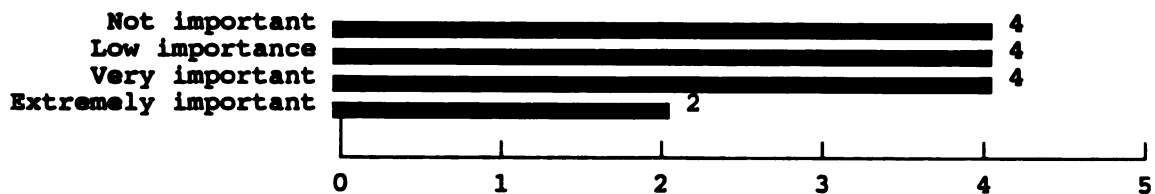
Value Label	Value	Frequency	Percent
Not important	1	2	15.4
Low importance	2	5	38.5
Very important	3	4	30.8
Extremely important	4	2	15.4
		-----	-----
Total		14	100.0



**18. Animal rights/welfare.**

**Average 2.29**

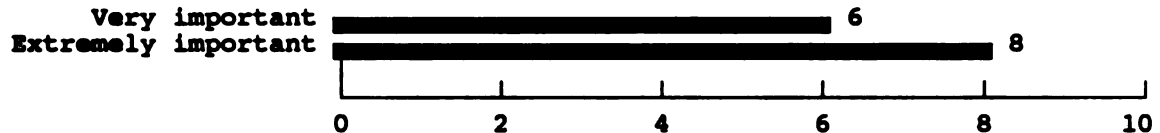
Value Label	Value	Frequency	Percent
Not important	1	4	28.6
Low importance	2	4	28.6
Very important	3	4	28.6
Extremely important	4	2	14.3
		-----	-----
Total		14	100.0



## 19. Saving farmland.

Average 3.57

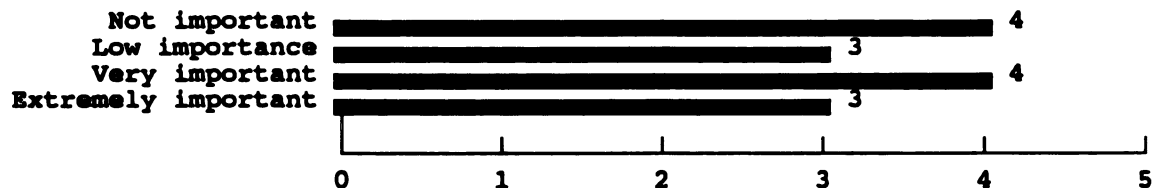
Value Label	Value	Frequency	Percent
Very important	3	6	42.9
Extremely important	4	8	57.1
		-----	-----
Total		14	100.0



## 20. Wetlands.

Average 2.43

Value Label	Value	Frequency	Percent
Not important	1	4	28.6
Low importance	2	3	21.4
Very important	3	4	28.6
Extremely important	4	3	21.4
		-----	-----
Total		14	100.0



## 21. Any other issue(s) that you feel needs to be addressed during the next mailing.

High taxes that are forcing people out of Michigan.

Jobs

Implications of growth of farm management organizations versus individual operations.

Medical and treatment of elderly people. The deterioration of neighborhoods, crime and police injustice.

Condition of roads and highways - terrible especially compared to other states.

Jobs/economy -must still diversity, replace diminish. auto industry

**Three-stage Delphi - Questionnaire #1**

<b>Variable</b>	<b>Mean</b>	<b>Std Dev</b>	<b>N</b>	<b>Label</b>
Q1	3.43	.85	14	Food safety
Q2	2.64	1.01	14	"Greenhouse Effect"
Q3	3.29	.73	14	Clean air
Q4	3.36	.93	14	Groundwater
Q5	3.54	.78	13	Property taxes
Q6	3.15	.80	13	Landfills
Q7	3.38	.65	13	Use of MI lands
Q8	2.23	.93	13	Acid Rain
Q9	3.00	1.00	13	Attracting tourists
Q10	2.57	1.09	14	Lawn pesticides
Q11	2.86	.86	14	Agricultural pesticides
Q12	2.64	1.01	14	Organic farming
Q13	2.31	.95	13	Genetic engineering
Q14	2.38	1.04	13	International food trade
Q15	3.21	.80	14	Recycling
Q16	2.79	1.05	14	Understanding food from farm to table
Q17	2.46	.97	13	Animal waste disposal
Q18	2.29	1.07	14	Animal rights/welfare
Q19	3.57	.51	14	Saving farmland
Q20	2.43	1.16	14	Wetlands

**Michigan Issues**  
**Three stage Delphi - Questionnaire # 2**

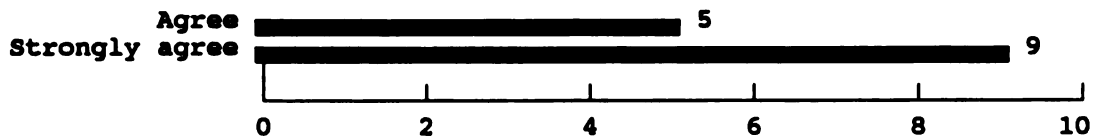
The "Average" values listed below are based on the following four point Likert scale.

Levels of agreement:           1 = Strongly disagree  
                                   2 = Disagree  
                                   3 = Agree  
                                   4 = Strongly agree

1. Farmland must be preserved in order to have food now and in the future.

Average 3.64

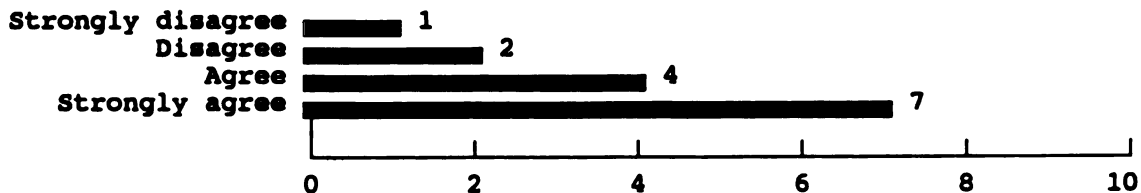
Value Label	Value	Frequency	Valid Percent
Agree	3	5	35.7
Strongly agree	4	9	64.3
		-----	-----
	Total	14	100.0



2. Recycling programs within Michigan should be more uniform.

Average 3.21

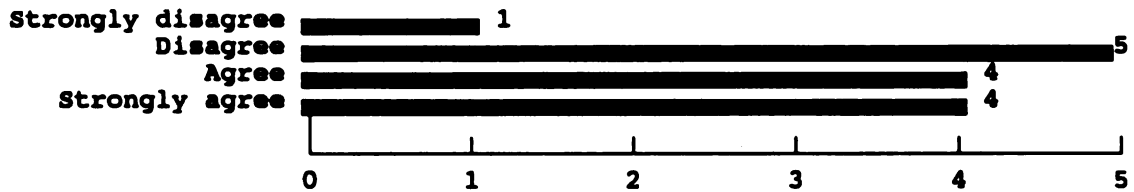
Value Label	Value	Frequency	Valid Percent
Strongly disagree	1	1	7.1
Disagree	2	2	14.3
Agree	3	4	28.6
Strongly agree	4	7	50.0
		-----	-----
	Total	14	100.0



**3. Michigan should increase air quality through government regulation.**

**Average 2.79**

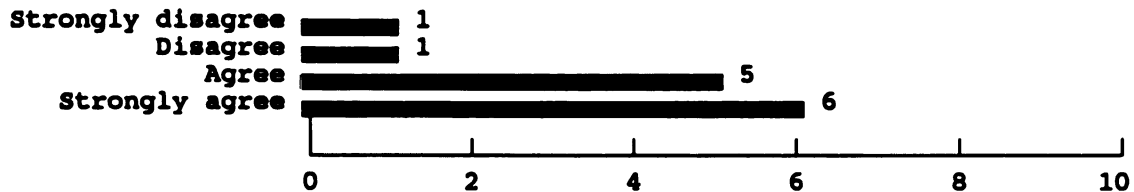
Value Label	Value	Frequency	Valid Percent
Strongly disagree	1	1	7.1
Disagree	2	5	35.7
Agree	3	4	28.6
Strongly agree	4	4	28.6
		-----	-----
Total		14	100.0



**4. Groundwater quality may be a more serious problem than currently believed because of insufficient knowledge.**

**Average 3.23**

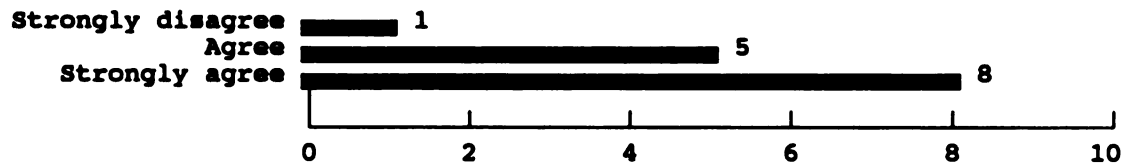
Value Label	Value	Frequency	Valid Percent
Strongly disagree	1	1	7.7
Disagree	2	1	7.7
Agree	3	5	38.5
Strongly agree	4	6	46.2
		-----	-----
Total		13	100.0



5. Michigan should research possible permanent alternatives to landfills.

Average 3.43

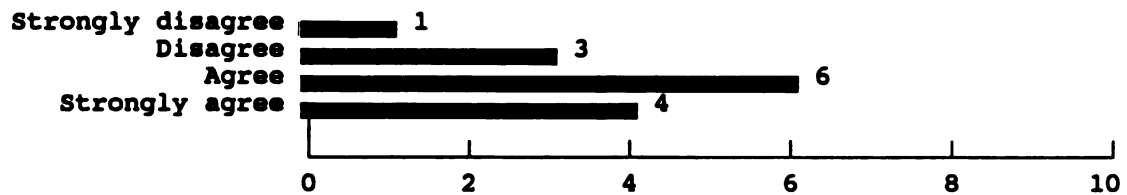
Value Label	Value	Frequency	Valid Percent
Strongly disagree	1	1	7.1
Agree	3	5	35.7
Strongly agree	4	8	57.1
		-----	-----
Total		14	100.0



6. Food safety should be improved even if it means higher food prices.

Average 2.93

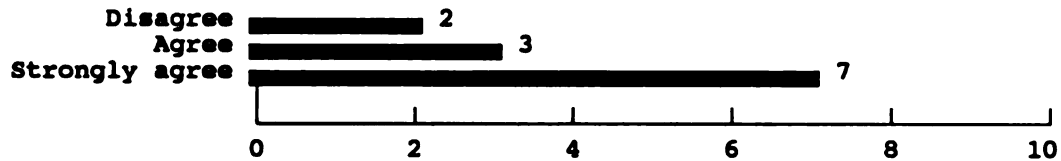
Value Label	Value	Frequency	Valid Percent
Strongly disagree	1	1	7.1
Disagree	2	3	21.4
Agree	3	6	42.9
Strongly agree	4	4	28.6
		-----	-----
Total		13	100.0



7. Property tax reform measures should be introduced.

Average 3.42

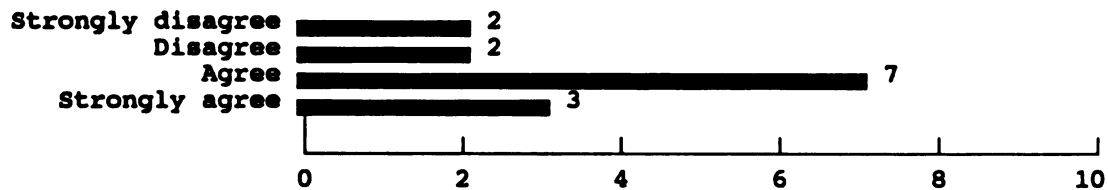
Value Label	Value	Frequency	Valid Percent
Disagree	2	2	16.7
Agree	3	3	25.0
Strongly agree	4	7	58.3
		-----	-----
Total		12	100.0



8. Michigan farmers should decrease their use of pesticides.

Average 2.79

Value Label	Value	Frequency	Valid Percent
Strongly disagree	1	2	14.3
Disagree	2	2	14.3
Agree	3	7	50.0
Strongly agree	4	3	21.4
		-----	-----
Total		14	100.0



9. Michigan needs to increase efforts to promote tourism.

Average 2.86

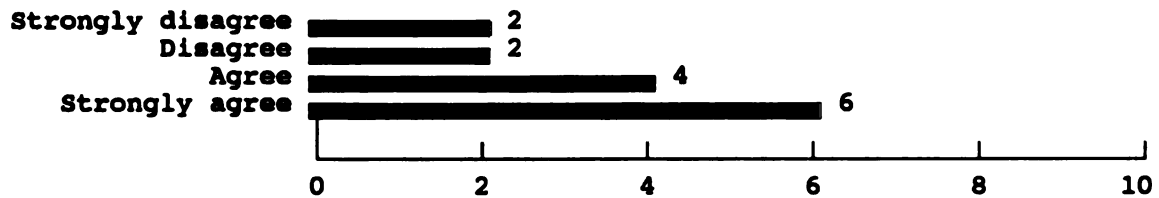
Value Label	Value	Frequency	Valid Percent
Strongly disagree	1	2	14.3
Disagree	2	2	14.3
Agree	3	6	42.9
Strongly agree	4	4	28.6
		-----	-----
Total		14	100.0



10. Lawn owners should decrease their use of pesticides/fertilizers.

Average 3.00

Value Label	Value	Frequency	Valid Percent
Strongly disagree	1	2	14.3
Disagree	2	2	14.3
Agree	3	4	28.6
Strongly agree	4	6	42.9
		-----	-----
Total		14	100.0

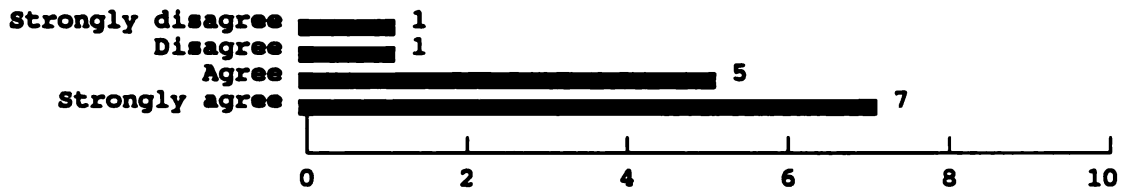




11. It is important to maintain Michigan lands (forests, state parks, shorelines, etc.) as natural sites of beauty for Michigan natives and tourists.

Average 3.29

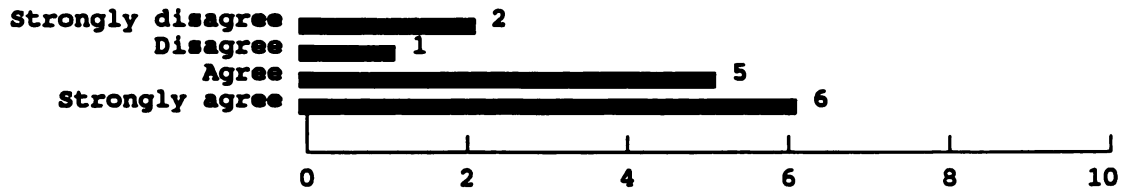
Value Label	Value	Frequency	Valid Percent
Strongly disagree	1	1	7.1
Disagree	2	1	7.1
Agree	3	5	35.7
Strongly agree	4	7	50.0
		-----	-----
Total		14	100.0



12. Wetlands need to be protected and preserved because they are needed for the survival of wildlife.

Average 3.07

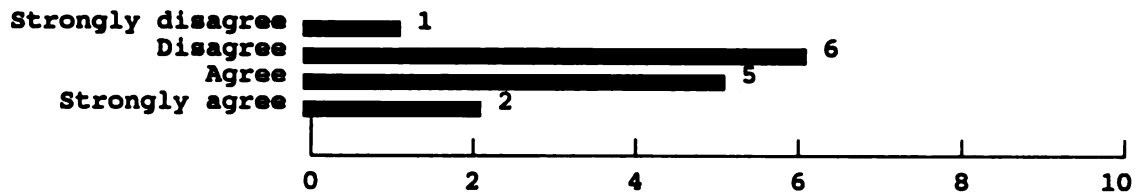
Value Label	Value	Frequency	Valid Percent
Strongly disagree	1	2	14.3
Disagree	2	1	7.1
Agree	3	5	35.7
Strongly agree	4	6	42.9
		-----	-----
Total		14	100.0



13. Educational programs should be created to inform consumers about how food is produced.

Average 2.57

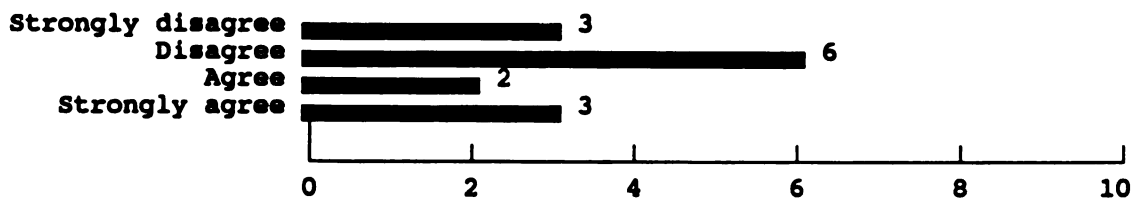
Value Label	Value	Frequency	Valid Percent
Strongly disagree	1	1	7.1
Disagree	2	6	42.9
Agree	3	5	35.7
Strongly agree	4	2	14.3
		-----	-----
Total		14	100.0



14. The greenhouse effect is an overblown issue.

Average 2.36

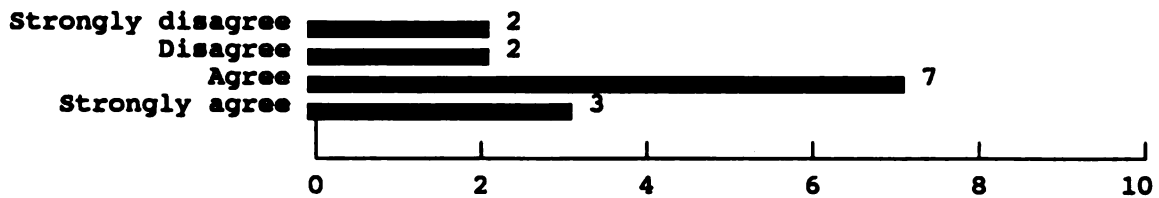
Value Label	Value	Frequency	Valid Percent
Strongly disagree	1	3	21.4
Disagree	2	6	42.9
Agree	3	2	14.3
Strongly agree	4	3	21.4
		-----	-----
Total		14	100.0



15. International food trade is important to all nations' economies.

Average 2.79

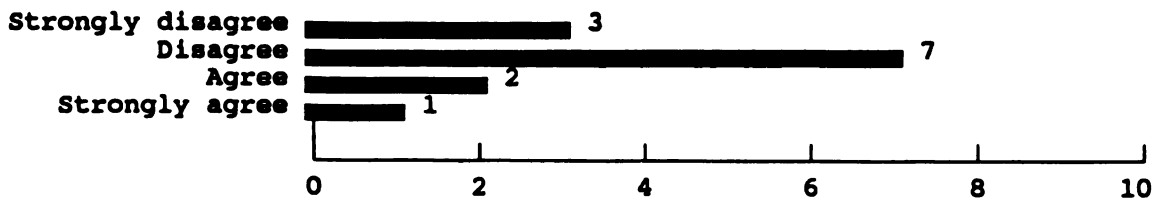
Value Label	Value	Frequency	Valid Percent
Strongly disagree	1	2	14.3
Disagree	2	2	14.3
Agree	3	7	50.0
Strongly agree	4	3	21.4
		-----	-----
Total		14	100.0



16. Animal wastes should be used only on crops grown for animal consumption.

Average 2.08

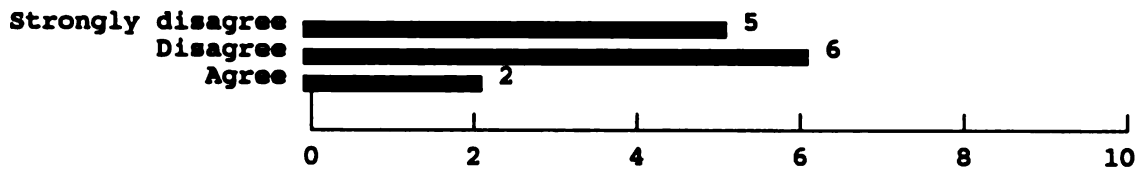
Value Label	Value	Frequency	Valid Percent
Strongly disagree	1	3	23.1
Disagree	2	7	53.8
Agree	3	2	15.4
Strongly agree	4	1	7.7
		-----	-----
Total		13	100.0



17. Acid rain is not a problem in Michigan.

Average 1.77

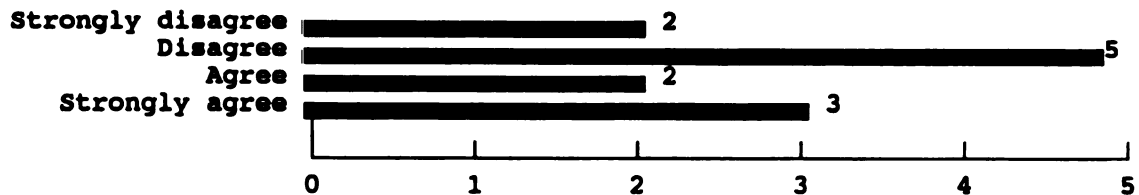
Value Label	Value	Frequency	Valid Percent
Strongly disagree	1	5	38.5
Disagree	2	6	46.2
Agree	3	2	15.4
		-----	-----
Total		13	100.0



18. Organic farming is difficult to do on a large scale.

Average 2.50

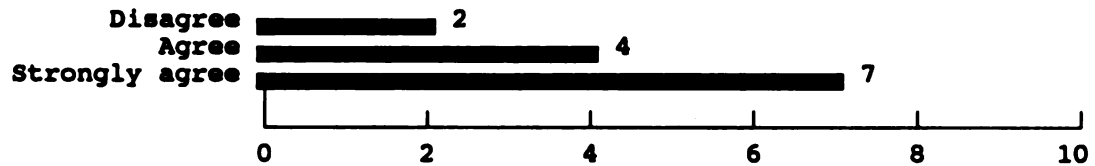
Value Label	Value	Frequency	Valid Percent
Strongly disagree	1	2	16.7
Disagree	2	5	41.7
Agree	3	2	16.7
Strongly agree	4	3	25.0
		-----	-----
Total		12	100.0



19. Animals need to be respected, however, we need to stress human rights over animal rights.

Average 3.38

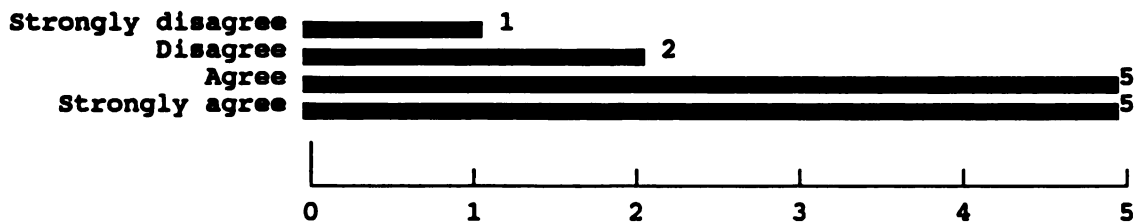
Value Label	Value	Frequency	Valid Percent
Disagree	2	2	15.4
Agree	3	4	30.8
Strongly agree	4	7	53.8
		-----	-----
Total		13	100.0



20. People need to be better informed about genetic engineering.

Average 3.08

Value Label	Value	Frequency	Valid Percent
Strongly disagree	1	1	7.7
Disagree	2	2	15.4
Agree	3	5	38.5
Strongly agree	4	5	38.5
		-----	-----
Total		13	100.0



**Three-stage Delphi - Questionnaire #2**

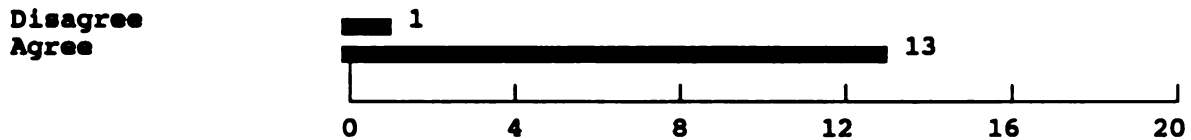
<b>Variable</b>	<b>Mean</b>	<b>Std Dev</b>	<b>N</b>	<b>Label</b>
Q1	3.64	.50	14	Saving farmland
Q2	3.21	.97	14	Recycling
Q3	2.79	.97	14	Air quality
Q4	3.23	.93	13	Groundwater quality
Q5	3.43	.85	14	Landfill alternatives
Q6	2.93	.92	14	Food safety
Q7	3.42	.79	12	Property tax reform
Q8	2.79	.97	14	Decrease pesticide use
Q9	2.86	1.03	14	Promote tourism
Q10	3.00	1.11	14	Decrease lawn chemical use
Q11	3.29	.91	14	Maintain MI lands
Q12	3.07	1.07	14	Wetlands
Q13	2.57	.85	14	Educational program on food
Q14	2.36	1.08	14	"Greenhouse Effect"
Q15	2.79	.97	14	International food trade
Q16	2.08	.86	13	Animal wastes
Q17	1.77	.73	13	Acid rain
Q18	2.50	1.09	12	Organic farming
Q19	3.38	.77	13	Animals need to be respected
Q20	3.08	.95	13	Genetic engineering

**Michigan Issues  
Three-stage Delphi - Questionnaire #3**

The scale: 1 = I disagree with the statement  
2 = I agree with the statement

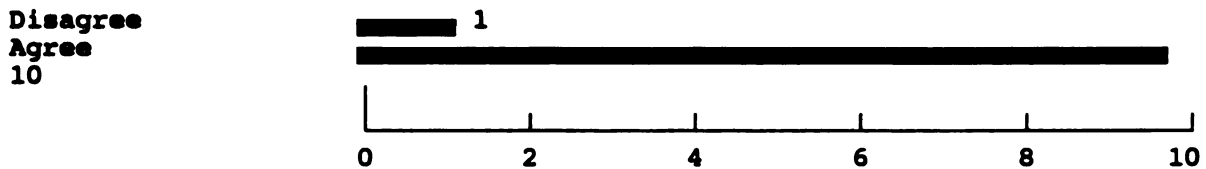
1. Farmland must be preserved in order to have food now and in the future.

Value Label	Value	Frequency	Percent
Disagree with statement	1	1	7.1
Agree with statement	2	13	92.9
		-----	-----
	Total	14	100.0



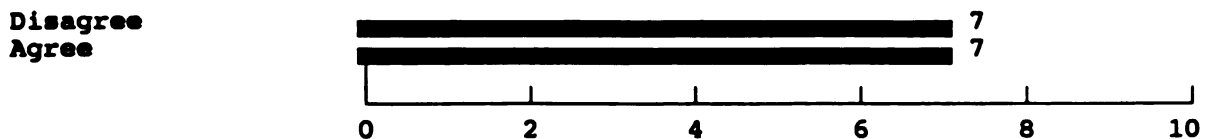
2. Property tax reform should be introduced.

Value Label	Value	Frequency	Percent
Disagree with statement	1	1	9.1
Agree with statement	2	10	90.9
		-----	-----
	Total	11	100.0



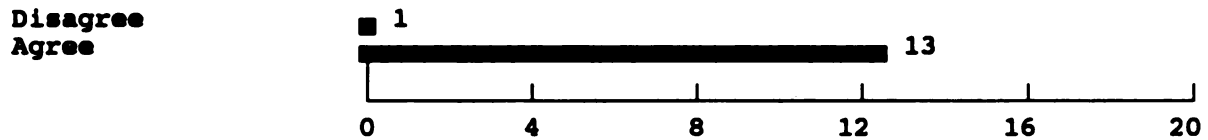
3. Food safety should be improved even if it means higher food prices.

Value Label	Value	Frequency	Percent
Disagree with statement	1	7	50.0
Agree with statement	2	7	50.0
		-----	-----
	Total	14	100.0



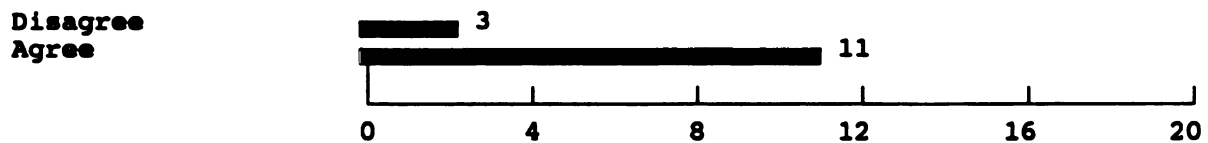
4. It is important to maintain Michigan lands (forests, state parks, shorelines, etc.) as natural sites of beauty for Michigan natives and tourists.

Value Label	Value	Frequency	Percent
Disagree with statement	1	1	7.1
Agree with statement	2	13	92.9
		-----	-----
	Total	14	100.0



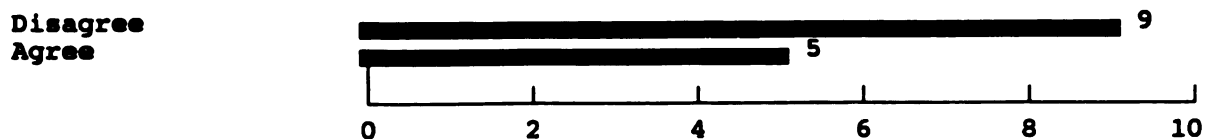
5. Groundwater quality may be a more serious problem than currently believed because of insufficient knowledge.

Value Label	Value	Frequency	Percent
Disagree with statement	1	3	21.4
Agree with statement	2	11	78.6
		-----	-----
	Total	14	100.0



6. Michigan should increase air quality through government regulation.

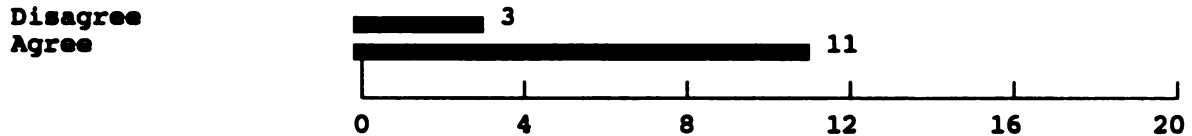
Value Label	Value	Frequency	Percent
Disagree with statement	1	9	64.3
Agree with statement	2	5	35.7
		-----	-----
	Total	14	100.0





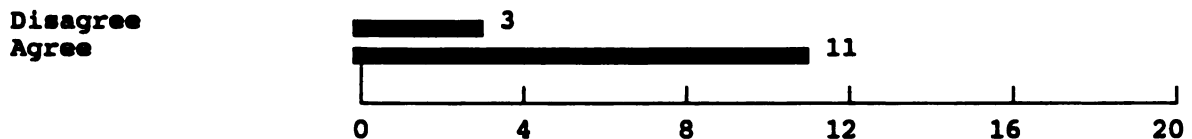
**7. Recycling programs within Michigan should be more uniform.**

Value Label	Value	Frequency	Percent
Disagree with statement	1	3	21.4
Agree with statement	2	11	78.6
		-----	-----
Total		14	100.0



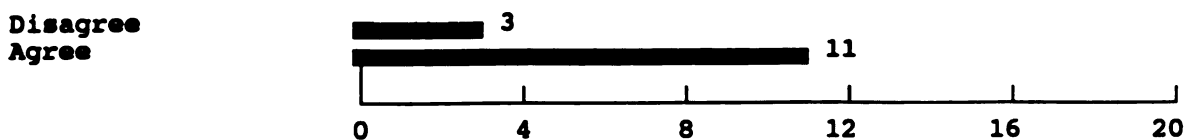
**8. Michigan should research possible permanent alternatives to landfills.**

Value Label	Value	Frequency	Percent
Disagree with statement	1	3	21.4
Agree with statement	2	11	78.6
		-----	-----
Total		14	100.0



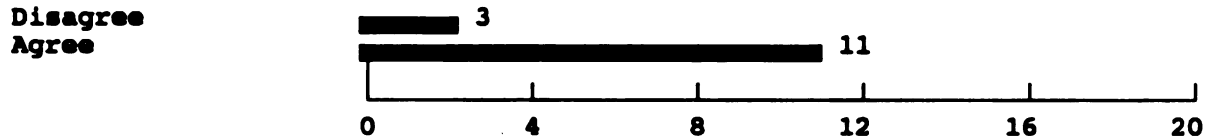
**9. Michigan needs to increase efforts to promote tourism.**

Value Label	Value	Frequency	Percent
Disagree with statement	1	3	21.4
Agree with statement	2	11	78.6
		-----	-----
Total		14	100.0



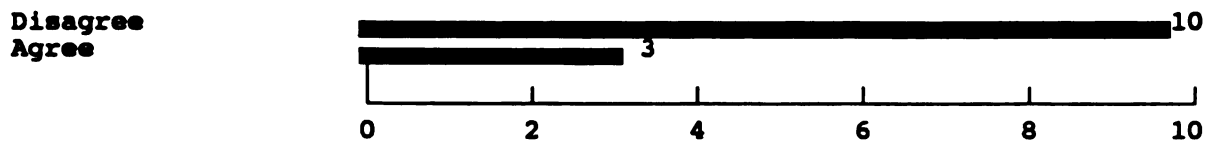
10. Michigan farmers should decrease their use of pesticides.

Value Label	Value	Frequency	Percent
Disagree with statement	1	3	21.4
Agree with statement	2	11	78.6
		-----	-----
Total		14	100.0



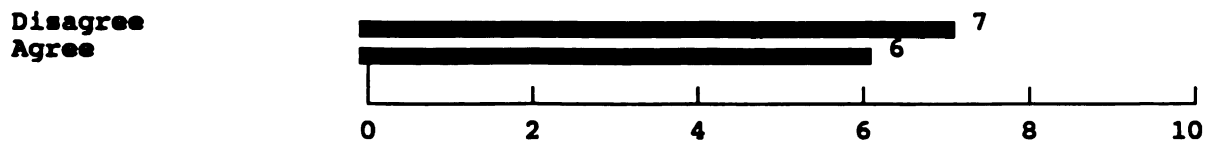
11. Educational programs should be created to inform consumers about how food is produced.

Value Label	Value	Frequency	Percent
Disagree with statement	1	10	76.9
Agree with statement	2	3	23.1
		-----	-----
Total		13	100.0



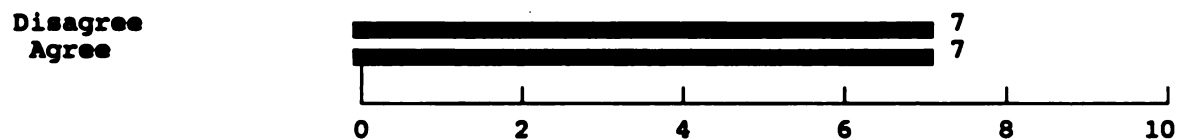
12. Organic farming could be accomplished on a large scale.

Value Label	Value	Frequency	Percent
Disagree with statement	1	7	53.8
Agree with statement	2	6	46.2
		-----	-----
Total		13	100.0



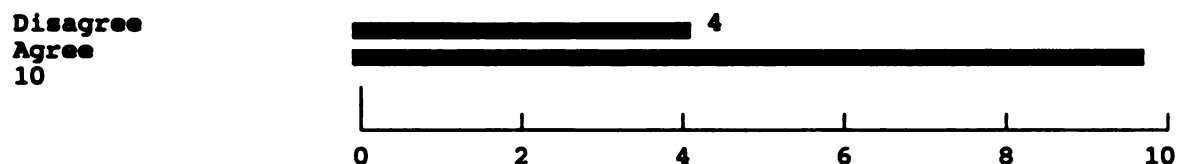
13. The "Greenhouse Effect" is an issue of concern in Michigan.

Value Label	Value	Frequency	Percent
Disagree with statement	1	7	50.0
Agree with statement	2	7	50.0
		-----	-----
	Total	14	100.0



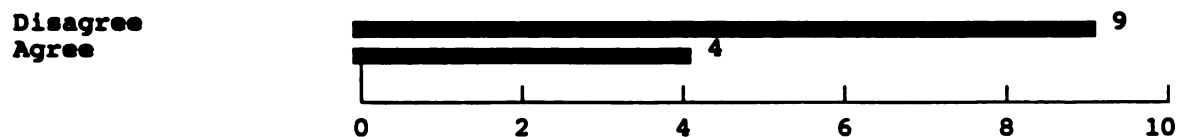
14. Lawn owners should decrease their use of pesticides/fertilizers.

Value Label	Value	Frequency	Percent
Disagree with statement	1	4	28.6
Agree with statement	2	10	71.4
		-----	-----
	Total	14	100.0



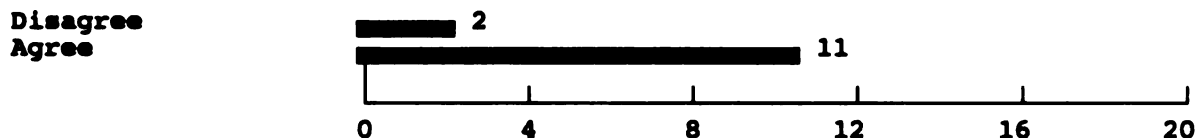
15. Animal wastes should be used only on crops grown for animal consumption.

Value Label	Value	Frequency	Percent
Disagree with statement	1	9	69.2
Agree with statement	2	4	30.8
		-----	-----
	Total	13	100.0



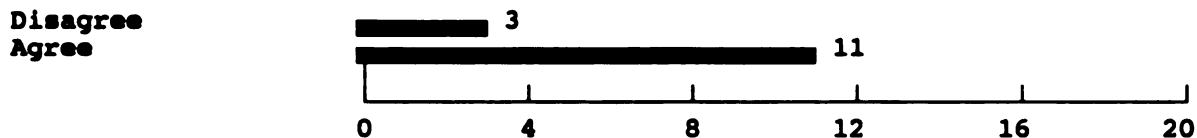
16. Wetlands need to be protected and preserved because they are needed for the survival of wildlife.

Value Label	Value	Frequency	Percent
Disagree with statement	1	2	15.4
Agree with statement	2	11	84.6
		-----	-----
Total		13	100.0



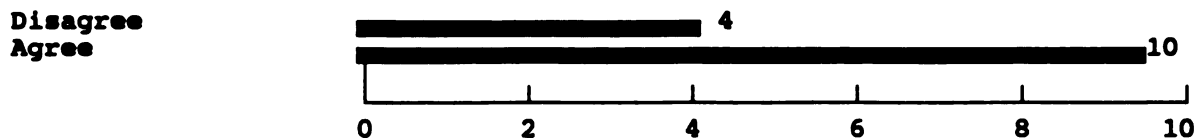
17. International food trade is important to all nations' economies.

Value Label	Value	Frequency	Percent
Disagree with statement	1	3	21.4
Agree with statement	2	11	78.6
		-----	-----
Total		14	100.0



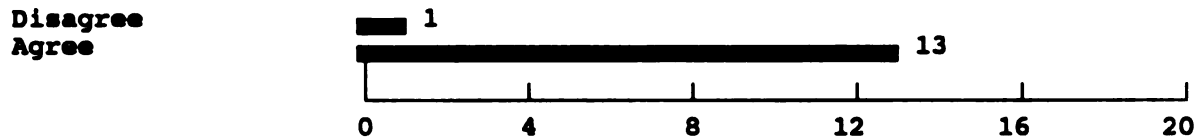
18. People need to be better informed about genetic engineering.

Value Label	Value	Frequency	Percent
Disagree with statement	1	4	28.6
Agree with statement	2	10	71.4
		-----	-----
Total		14	100.0



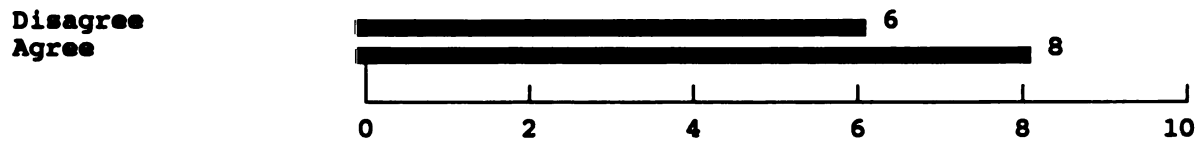
19. Animals need to be respected however, we need to stress human rights over animal rights.

Value Label	Value	Frequency	Percent
Disagree with statement	1	1	7.1
Agree with statement	2	13	92.9
		-----	-----
Total		14	100.0



20. Acid rain is a concern in Michigan.

Value Label	Value	Frequency	Percent
Disagree with statement	1	6	42.9
Agree with statement	2	8	57.1
		-----	-----
Total		14	100.0



**Three-stage Delphi - Questionnaire #3**

<b>Variable</b>	<b>Mean</b>	<b>Std Dev</b>	<b>N</b>	<b>Label</b>
Q1	1.93	.27	14	1. Saving farmland
Q2	1.91	.30	11	2. Property tax reform
Q3	1.50	.52	14	3. Food safety
Q4	1.93	.27	14	4. Maintain MI lands
Q5	1.79	.43	14	5. Groundwater quality
Q6	1.36	.50	14	6. Air quality
Q7	1.79	.43	14	7. Recycling
Q8	1.79	.43	14	8. Landfill alternatives
Q9	1.79	.43	14	9. Promote tourism
Q10	1.79	.43	14	10. Decrease pesticide use
Q11	1.23	.44	13	11. Educational program on food
Q12	1.46	.52	13	12. Organic farming
Q13	1.50	.52	14	13. "Greenhouse Effect"
Q14	1.71	.47	14	14. Decrease lawn chemical use
Q15	1.31	.48	13	15. Animal wastes
Q16	1.85	.38	13	16. Wetlands
Q17	1.79	.43	14	17. International food trade
Q18	1.71	.47	14	18. Genetic engineering
Q19	1.93	.27	14	19. Animals need to be
respected				
Q20	1.57	.51	14	20. Acid rain

**APPENDIX G**  
**SUPPLEMENTAL DATA ANALYSIS**  
**FOUR-STAGE DELPHI**

**Michigan Issues  
Four-stage Delphi - Questionnaire #2**

The average values listed below are based on the following four point Likert scale.

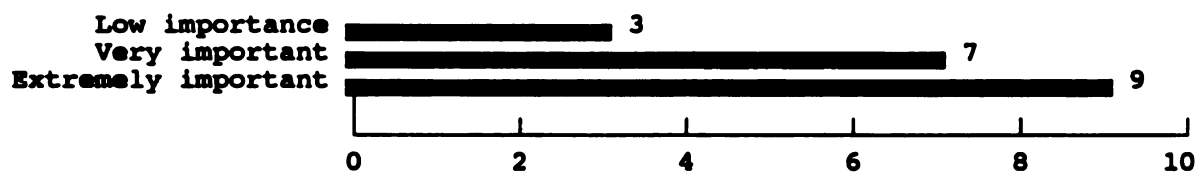
**Levels of importance:**

- 1 = Not important
- 2 = Low importance
- 3 = Very important
- 4 = Extremely important

**1. Water pollution.**

Average 3.32

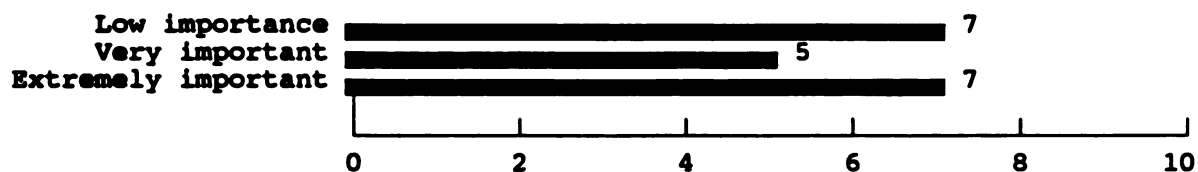
Value Label	Value	Frequency	Percent
Low importance	2	3	15.8
Very important	3	7	36.8
Extremely important	4	9	47.4
		-----	-----
Total		19	100.0



**2. Food safety.**

Average 3.00

Value Label	Value	Frequency	Percent
Low importance	2	7	36.8
Very important	3	5	26.3
Extremely important	4	7	36.8
		-----	-----
Total		19	100.0

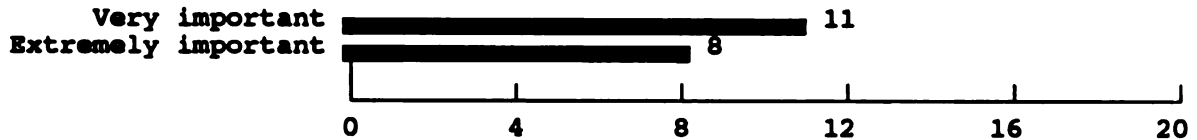




## 3. Landfills.

Average 3.42

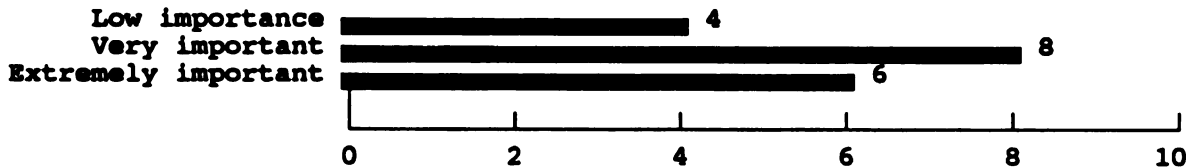
Value Label	Value	Frequency	Percent
Very important	3	11	57.9
Extremely important	4	8	42.1
		-----	-----
Total		19	100.0



## 4. Air pollution.

Average 3.11

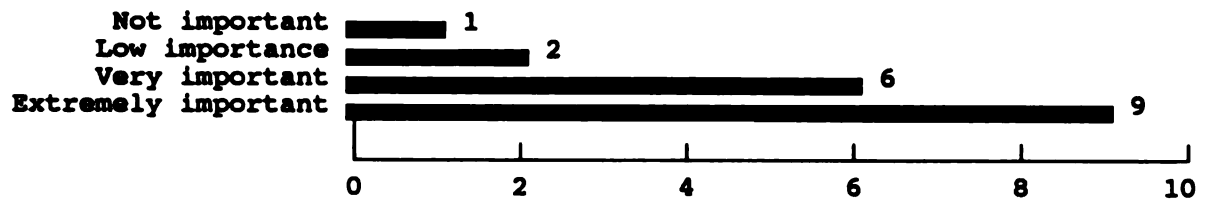
Value Label	Value	Frequency	Percent
Low importance	2	4	22.2
Very important	3	8	44.4
Extremely important	4	6	33.3
		-----	-----
Total		19	100.0



## 5. Michigan economy.

Average 3.28

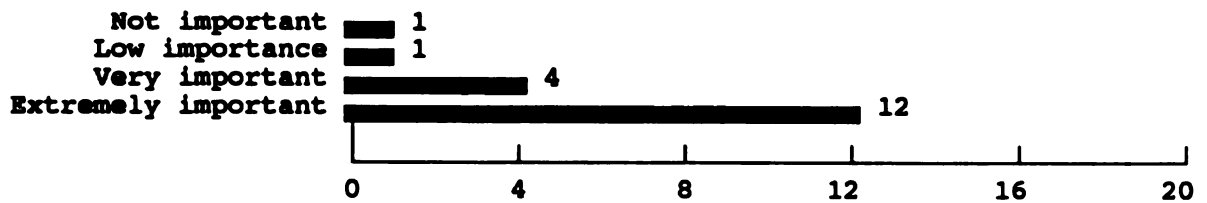
Value Label	Value	Frequency	Percent
Not important	1	1	5.6
Low importance	2	2	11.1
Very important	3	6	33.3
Extremely important	4	9	50.0
		-----	-----
Total		19	100.0



## 6. Drinking water

Average 3.50

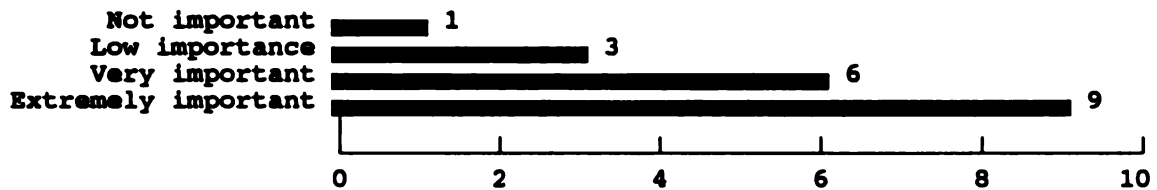
Value Label	Value	Frequency	Percent
Not important	1	1	5.6
Low importance	2	1	5.6
Very important	3	4	22.2
Extremely important	4	12	66.7
		-----	-----
Total		19	100.0



## 7. Property taxes.

Average 3.21

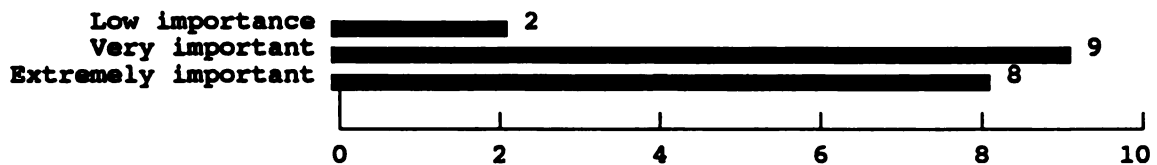
Value Label	Value	Frequency	Percent
Not important	1	1	5.3
Low importance	2	3	15.8
Very important	3	6	31.6
Extremely important	4	9	47.4
		-----	-----
Total		19	100.0



## 8. Recycling.

Average 3.32

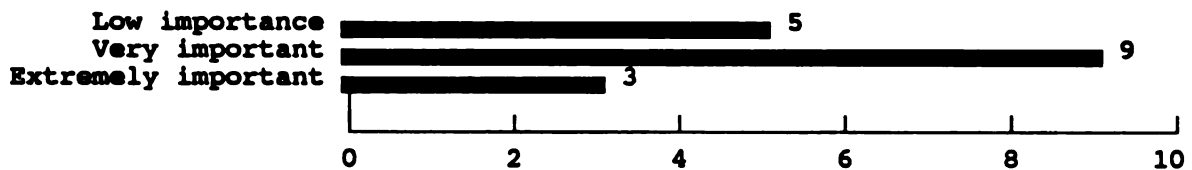
Value Label	Value	Frequency	Percent
Low importance	2	2	10.5
Very important	3	9	47.4
Extremely important	4	8	42.1
		-----	-----
Total		19	100.0



## 9. Agricultural chemical use.

Average 2.88

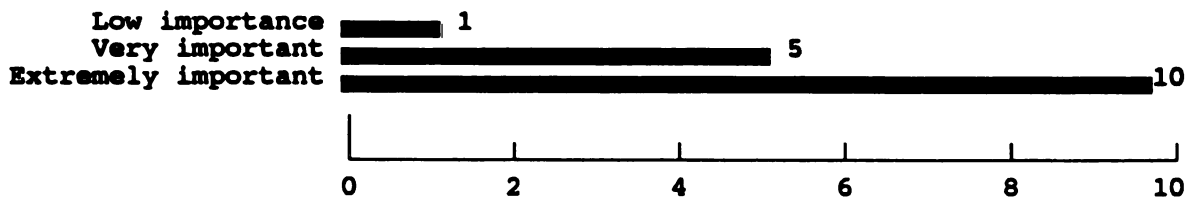
Value Label	Value	Frequency	Percent
Low importance	2	5	29.4
Very important	3	9	52.9
Extremely important	4	3	17.6
		-----	-----
Total		17	100.0



## 10. Disposal of nuclear and chemical wastes.

Average 3.56

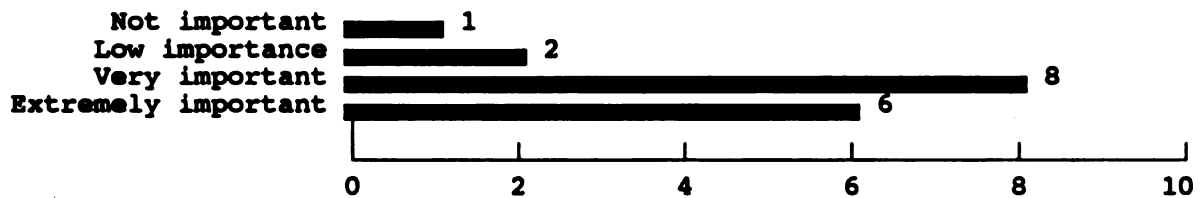
Value Label	Value	Frequency	Percent
Low importance	2	1	6.3
Very important	3	5	31.3
Extremely important	4	10	62.5
		-----	-----
Total		12	100.0



## 11. Saving Farmland

Average 3.12

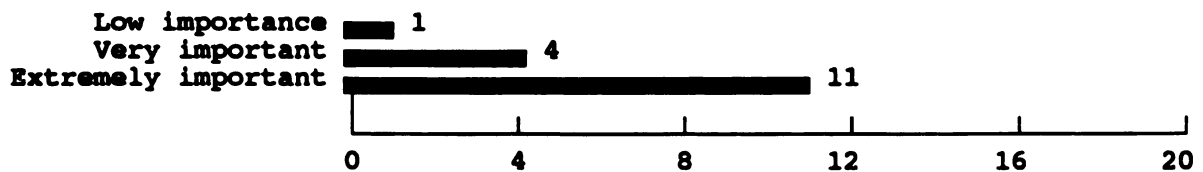
Value Label	Value	Frequency	Percent
Not important	1	1	5.9
Low importance	2	2	11.8
Very important	3	8	47.1
Extremely important	4	6	35.3
		-----	-----
Total		17	100.0



## 12. Michigan education system.

Average 3.62

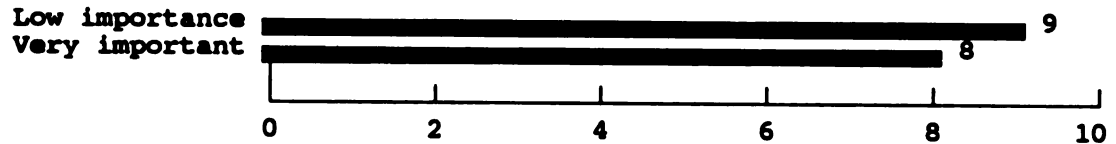
Value Label	Value	Frequency	Percent
Low importance	2	1	6.3
Very important	3	4	25.0
Extremely important	4	11	68.8
		-----	-----
Total		16	100.0



## 13. State parks.

Average 2.47

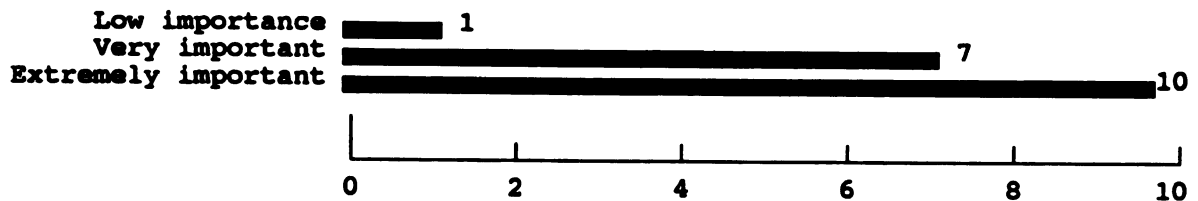
Value Label	Value	Frequency	Percent
Low importance	2	9	52.9
Very important	3	8	47.1
		-----	-----
		17	100.0



## 14. Toxic waste

Average 3.50

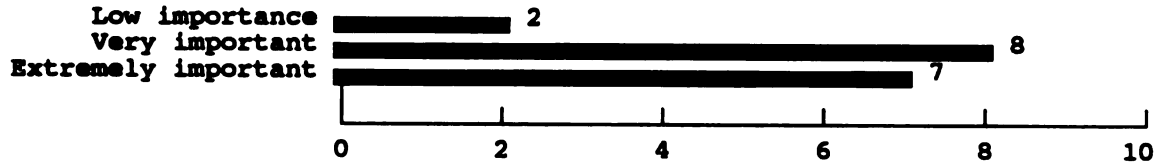
Value Label	Value	Frequency	Percent
Low importance	2	1	5.6
Very important	3	7	38.9
Extremely important	4	10	55.6
		-----	-----
Total		18	100.0



## 15. Maintenance of Michigan roads.

Average 3.29

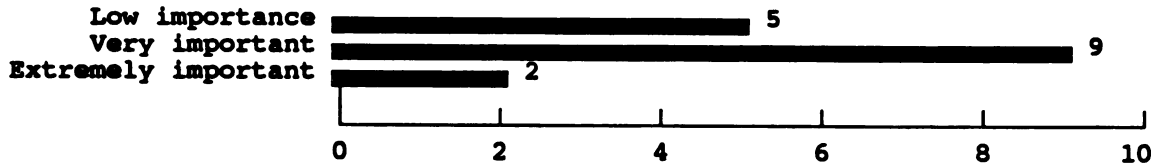
Value Label	Value	Frequency	Percent
Low importance	2	2	11.8
Very important	3	8	47.1
Extremely important	4	7	41.2
		-----	-----
Total		17	100.0



## 16. Logging of Michigan woodlands.

Average 2.81

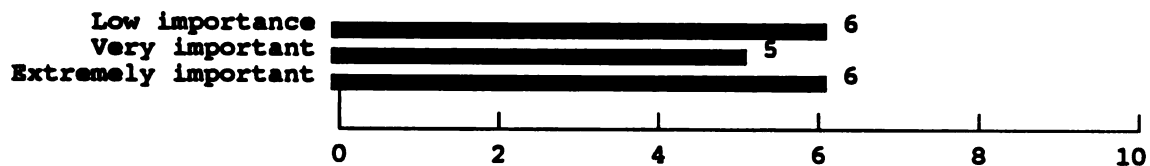
Value Label	Value	Frequency	Percent
Low importance	2	5	31.3
Very important	3	9	56.3
Extremely important	4	2	12.5
		-----	-----
Total		16	100.0



## 17. Contaminated freshwater fish.

Average 3.00

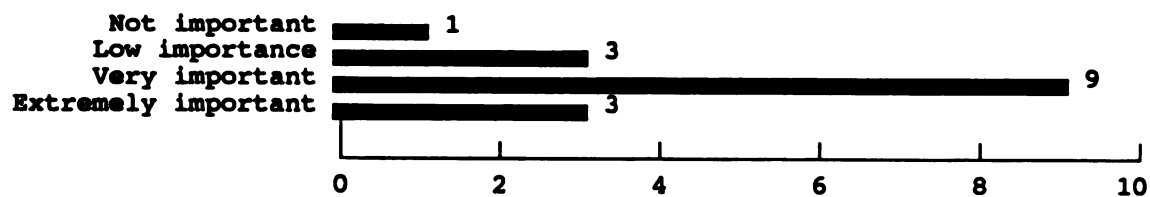
Value Label	Value	Frequency	Percent
Low importance	2	6	35.3
Very important	3	5	29.4
Extremely important	4	6	35.3
		-----	-----
Total		17	100.0



## 18. Use of Michigan land.

Average 2.87

Value Label	Value	Frequency	Percent
Not important	1	1	6.3
Low importance	2	3	18.8
Very important	3	9	56.3
Extremely important	4	3	18.8
		-----	-----
Total		16	100.0

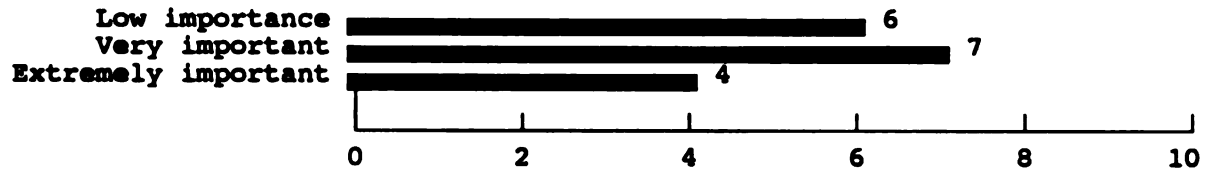




## 19. Wetlands.

Average 2.88

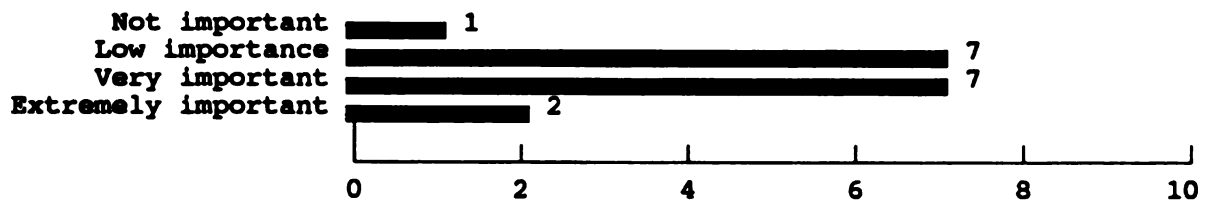
Value Label	Value	Frequency	Percent
Low importance	2	6	35.3
Very important	3	7	41.2
Extremely important	4	4	23.5
		-----	-----
Total		17	100.0



## 20. Abandoned oil wells/drill sites.

Average 2.59

Value Label	Value	Frequency	Percent
Not important	1	1	5.9
Low importance	2	7	41.2
Very important	3	7	41.2
Extremely important	4	2	11.8
		-----	-----
Total		17	100.0



## Four-stage Delphi - Questionnaire #2

Variable	Mean	Std Dev	N	Label
Q1	3.32	.75	19	1. Water pollution.
Q2	3.00	.88	19	2. Food safety.
Q3	3.42	.51	19	3. Landfills.
Q4	3.11	.76	18	4. Air pollution.
Q5	3.28	.89	18	5. Michigan economy
Q6	3.50	.86	18	6. Drinking water
Q7	3.21	.92	19	7. Property taxes.
Q8	3.32	.67	19	8. Recycling.
Q9	2.88	.70	17	9. Agricultural chemical use
Q10	3.56	.63	16	10. Nuclear energy
Q11	3.12	.86	17	11. Saving farmland
Q12	3.62	.62	16	12. Michigan education system
Q13	2.47	.51	17	13. State parks.
Q14	3.50	.62	18	14. Toxic waste
Q15	3.29	.69	17	15. Maintaining roads
Q16	2.81	.66	16	16. Logging
Q17	3.00	.87	17	17. Freshwater fish
Q18	2.87	.81	16	18. Land use
Q19	2.88	.78	17	19. Wetlands.
Q20	2.59	.80	17	20. Abandoned oil wells

**Michigan Issues  
Four-stage Delphi - Questionnaire #3**

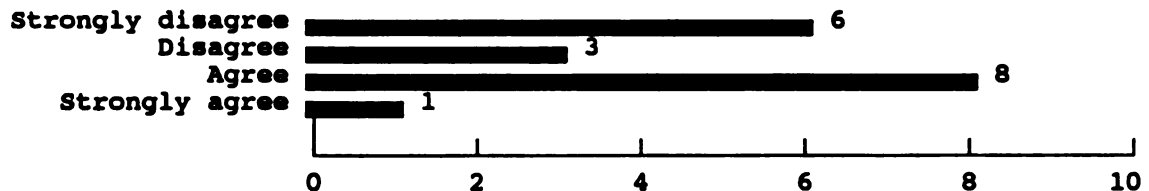
The "average" values listed below are based on the following four point Likert scale.

Levels of agreement:    1 = Strongly disagree  
                              2 = Disagree  
                              3 = Agree  
                              4 = Strongly agree

1.    **Michigan can be proud of its kindergarten through twelfth grade educational system.**

**Average 2.22**

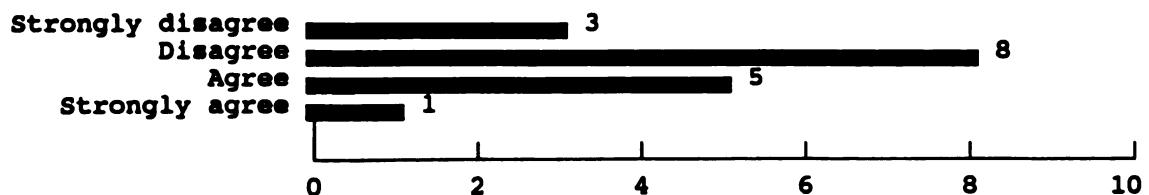
Value Label	Value	Frequency	Percent
Strongly disagree	1	6	33.3
Disagree	2	3	16.7
Agree	3	8	44.4
Strongly agree	4	1	5.6
		-----	-----
	Total	18	100.0



2.    **Processes that generate nuclear wastes should be banned because the wastes cannot be disposed of properly.**

**Average 2.24**

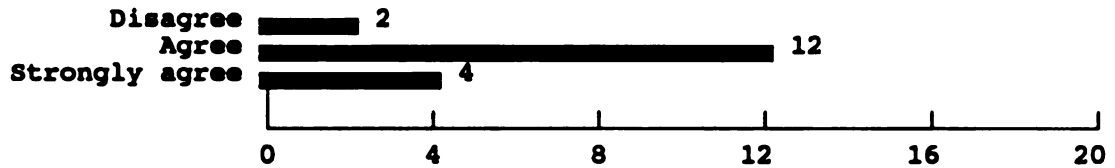
Value Label	Value	Frequency	Percent
Strongly disagree	1	3	17.6
Disagree	2	8	47.1
Agree	3	5	29.4
Strongly agree	4	1	5.9
		-----	-----
	Total	17	100.0



3. Recycling programs within Michigan should be more uniform.

Average 3.11

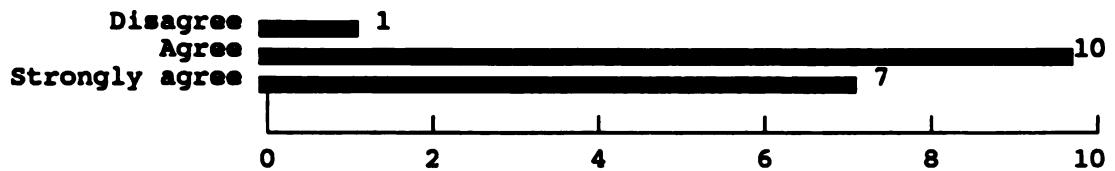
Value Label	Value	Frequency	Percent
Disagree	2	2	11.1
Agree	3	12	66.7
Strongly agree	4	4	22.2
		-----	-----
	Total	18	100.0



4. Michigan should research possible permanent alternatives to landfills.

Average 3.33

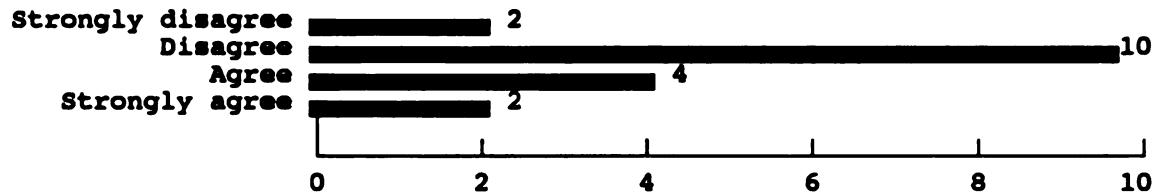
Value Label	Value	Frequency	Percent
Disagree	2	1	5.6
Agree	3	10	55.6
Strongly agree	4	7	38.9
		-----	-----
	Total	18	100.0



5. The methods of toxic waste disposal are adequate; the problem lies with communication.

Average 2.33

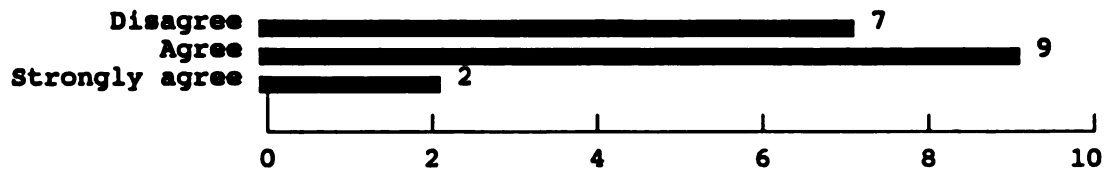
Value Label	Value	Frequency	Percent
Strongly disagree	1	2	11.1
Disagree	2	10	55.6
Agree	3	4	22.2
Strongly agree	4	2	11.1
		-----	-----
Total		18	100.0



6. Currently, Michigan has good, pure drinking water.

Average 2.72

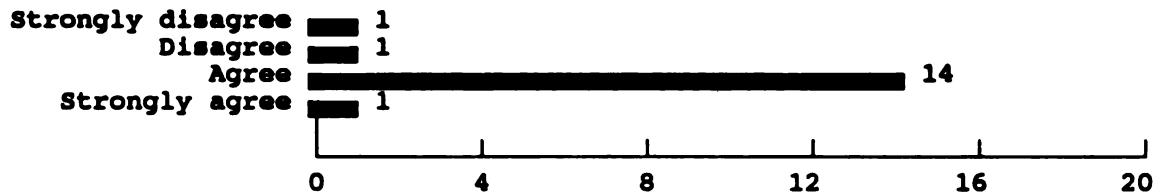
Value Label	Value	Frequency	Percent
Disagree	2	7	38.9
Agree	3	9	50.0
Strongly agree	4	2	11.1
		-----	-----
Total		18	100.0



7. The water pollution we acknowledge is only a small part of the real problem.

Average 2.88

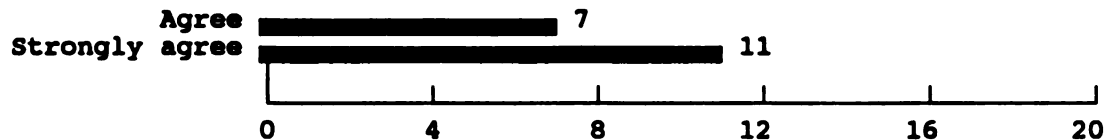
Value Label	Value	Frequency	Percent
Strongly disagree	1	1	5.9
Disagree	2	1	5.9
Agree	3	14	82.4
Strongly agree	4	1	5.9
		-----	-----
Total		17	100.0



8. Michigan's economy must begin to rely on other areas besides the automobile industry.

Average 3.61

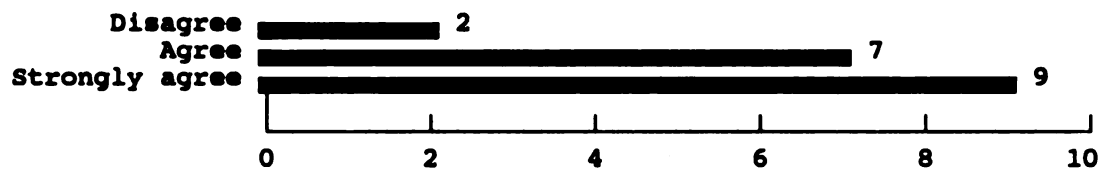
Value Label	Value	Frequency	Percent
Agree	3	7	38.9
Strongly agree	4	11	61.1
		-----	-----
Total		18	100.0



9. Property tax reform measures should be introduced.

Average 3.39

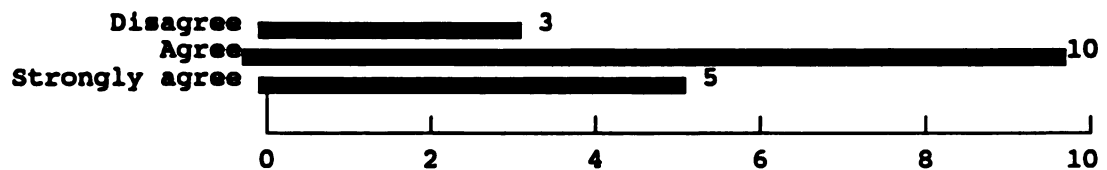
Value Label	Value	Frequency	Percent
Disagree	2	2	11.1
Agree	3	7	38.9
Strongly agree	4	9	50.0
		-----	-----
Total		18	100.0



10. Farmland must be preserved in order to have food now and in the future.

Average 3.11

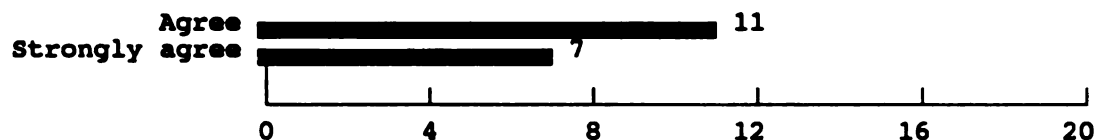
Value Label	Value	Frequency	Percent
Disagree	2	3	16.7
Agree	3	10	55.6
Strongly agree	4	5	27.8
		-----	-----
Total		18	100.0



11. Well maintained roads are worth paying for.

Average 3.39

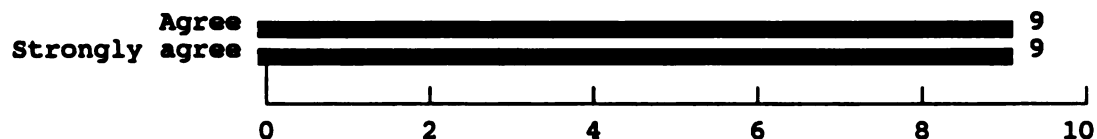
Value Label	Value	Frequency	Percent
Agree	3	11	61.1
Strongly agree	4	7	38.9
		-----	-----
Total		18	100.0



12. Sources of pollution which contaminate our freshwater fish must be found and stopped.

Average 3.50

Value Label	Value	Frequency	Percent
Agree	3	9	50.0
Strongly agree	4	9	50.0
		-----	-----
Total		18	100.0

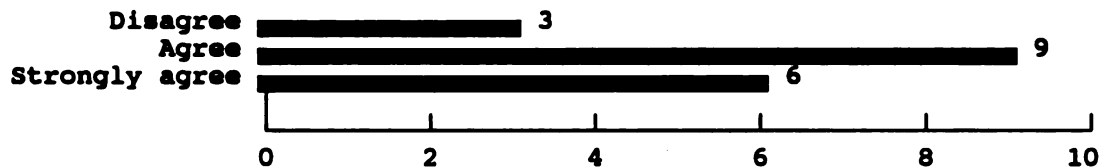




13. Wetlands need to be protected and preserved because they are needed for the survival of wildlife.

Average 3.17

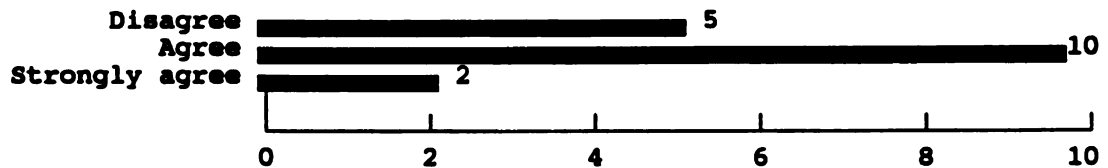
Value Label	Value	Frequency	Percent
Disagree	2	3	16.7
Agree	3	9	50.0
Strongly agree	4	6	33.3
		-----	-----
Total		18	100.0



14. Michigan should increase their air quality through government regulation.

Average 2.82

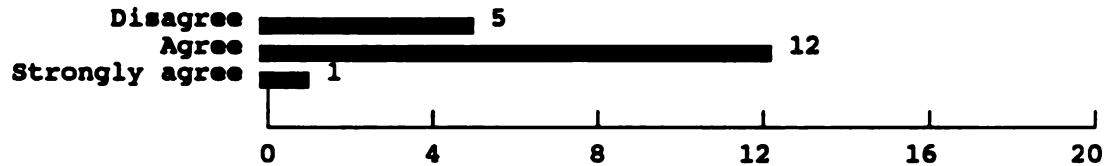
Value Label	Value	Frequency	Percent
Disagree	2	5	29.4
Agree	3	10	58.8
Strongly agree	4	2	11.8
		-----	-----
Total		17	100.0



15. Current food safety standards meet consumers' needs.

Average 2.78

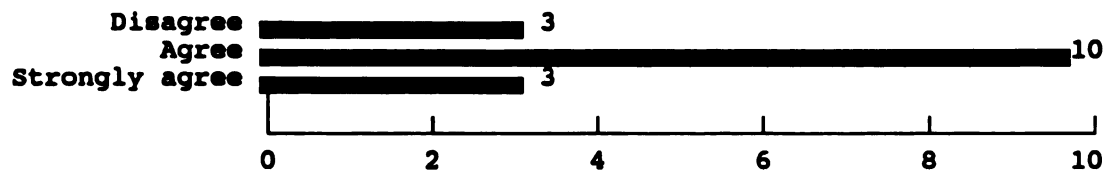
Value Label	Value	Frequency	Percent
Disagree	2	5	27.8
Agree	3	12	66.7
Strongly agree	4	1	5.6
		-----	-----
Total		18	100.0



16. Michigan farmers should decrease their use of agricultural chemicals.

Average 3.00

Value Label	Value	Frequency	Percent
Disagree	2	3	18.8
Agree	3	10	62.5
Strongly agree	4	3	18.8
		-----	-----
Total		16	100.0



17. Michigan land usage should be based on well developed plans.

Average 3.19

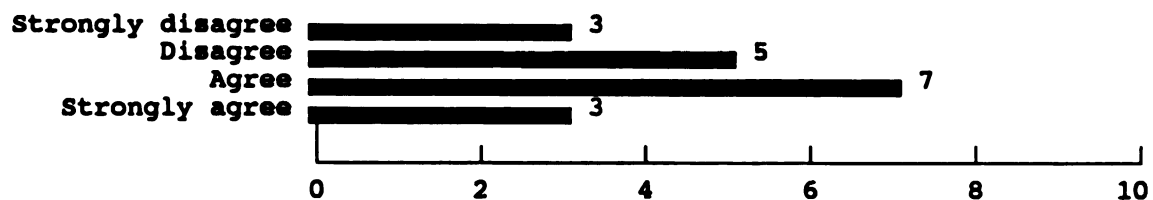
Value Label	Value	Frequency	Percent
Disagree	2	1	6.3
Agree	3	11	68.8
Strongly agree	4	4	25.0
		-----	-----
	Total	16	100.0



18. Intense logging is sound if replanting is adequate.

Average 2.56

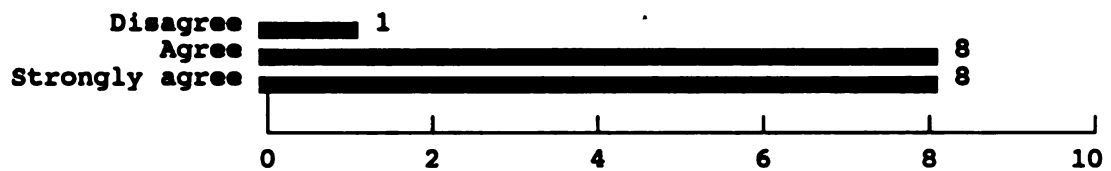
Value Label	Value	Frequency	Percent
Strongly disagree	1	3	16.7
Disagree	2	5	27.8
Agree	3	7	38.9
Strongly agree	4	3	16.7
		-----	-----
	Total	18	100.0



19. Abandoned oil well/drill sites should be restored to their undisturbed state.

Average 3.41

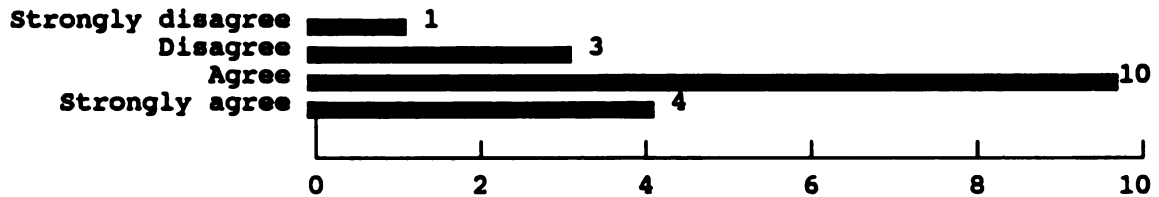
Value Label	Value	Frequency	Percent
Disagree	2	1	5.9
Agree	3	8	47.1
Strongly agree	4	8	47.1
		-----	-----
Total		17	100.0



20. Because of their importance, the quality of Michigan state parks is the responsibility of all Michigan people.

Average 2.94

Value Label	Value	Frequency	Percent
Strongly disagree	1	1	6.3
Disagree	2	2	12.5
Agree	3	9	56.3
Strongly agree	4	4	25.0
		-----	-----
Total		16	100.0



## Four-stage Delphi - Questionnaire #3

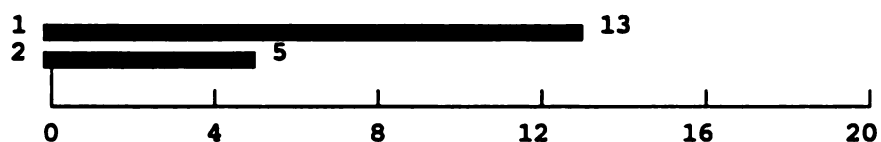
Variable	Mean	Std Dev	N	Label
Q1	2.22	1.00	18	1. Michigan education system
Q2	2.24	.83	17	2. Nuclear energy
Q3	3.11	.58	18	3. Recycling
Q4	3.33	.59	18	4. Landfill alternatives
Q5	2.33	.84	18	5. Toxic waste disposal
Q6	2.72	.67	18	6. Drinking water
Q7	2.88	.60	17	7. Water pollution
Q8	3.61	.50	18	8. Michigan's economy
Q9	3.39	.70	18	9. Property tax reform
Q10	3.11	.68	18	10. Saving farmland
Q11	3.39	.50	18	11. Road maintenance
Q12	3.50	.51	18	12. Freshwater fish
Q13	3.17	.71	18	13. Wetlands
Q14	2.82	.64	17	14. Air quality
Q15	2.78	.55	18	15. Food safety
Q16	3.00	.63	16	16. Agricultural chemical use
Q17	3.19	.54	16	17. Michigan land use
Q18	2.56	.98	18	18. Logging
Q19	3.41	.62	17	19. Abandoned oil wells
Q20	2.94	.80	18	20. State parks

**Michigan Issues  
Four-stage Delphi - Questionnaire #4**

The scale: 1 = I disagree with the statement  
2 = I agree with the statement

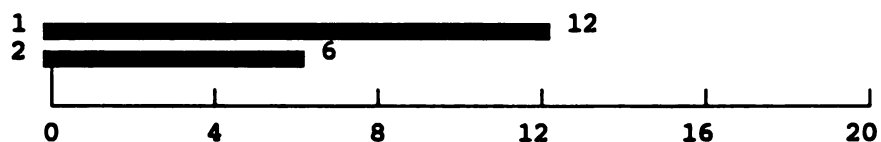
1. Michigan can be proud of its kindergarten through twelfth grade educational system.

Value Label	Value	Frequency	Percent
Disagree with statement	1	13	72.2
Agree with statement	2	5	27.8
		-----	-----
	Total	18	100.0



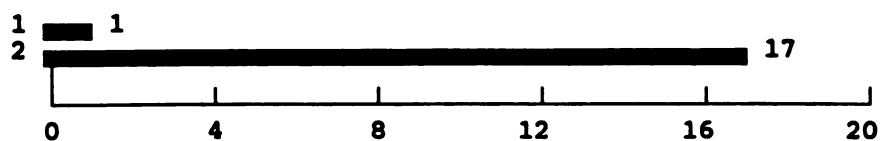
2. Processes that generate nuclear wastes should be banned because the wastes cannot be disposed of properly.

Value Label	Value	Frequency	Percent
Disagree with statement	1	12	66.7
Agree with statement	2	6	33.3
		-----	-----
	Total	18	100.0



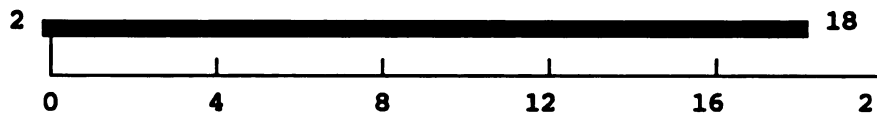
3. Recycling programs within Michigan should be more uniform.

Value Label	Value	Frequency	Percent
Disagree with statement	1	1	5.6
Agree with statement	2	17	94.4
		-----	-----
	Total	18	100.0



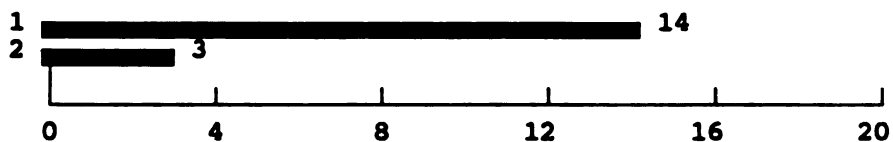
4. Michigan should research possible permanent alternatives to landfills.

Value Label	Value	Frequency	Percent
Agree with statement	2	18	100.0
		-----	-----
	Total	18	100.0



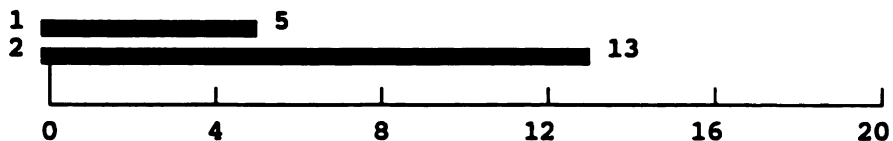
5. The methods of toxic waste disposal are adequate; the problem lies with communication.

Value Label	Value	Frequency	Percent
Disagree with statement	1	14	82.4
Agree with statement	2	3	17.6
		-----	-----
	Total	17	100.0



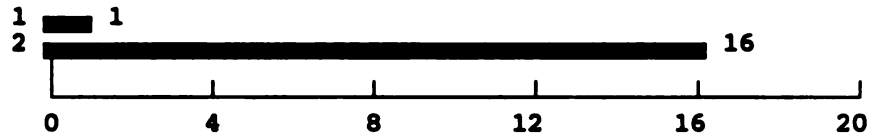
6. Currently, Michigan has good, pure drinking water.

Value Label	Value	Frequency	Percent
Disagree with statement	1	5	27.8
Agree with statement	2	13	72.2
		-----	-----
	Total	18	100.0



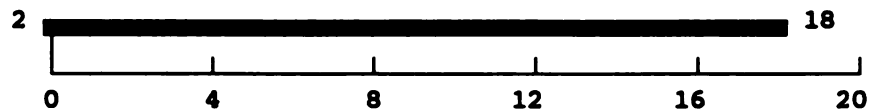
7. The water pollution we acknowledge is only a small part of the real problem.

Value Label	Value	Frequency	Percent
Disagree with statement	1	1	5.9
Agree with statement	2	16	94.1
		-----	-----
Total		17	100.0



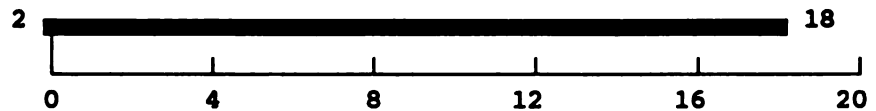
8. Michigan's economy must begin to rely on other areas besides the automobile industry.

Value Label	Value	Frequency	Percent
Agree with statement	2	18	100.0
		-----	-----
Total		18	100.0



9. Property tax reform measures should be introduced.

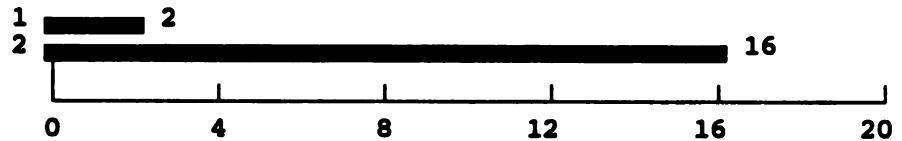
Value Label	Value	Frequency	Percent
Agree with statement	2	18	100.0
		-----	-----
Total		18	100.0





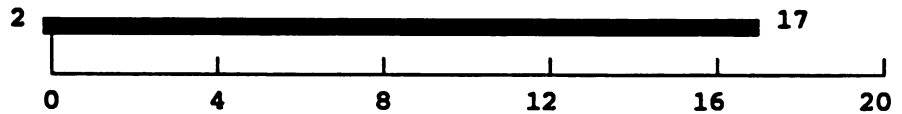
10. Farmland must be preserved in order to have food now and in the future.

Value Label	Value	Frequency	Percent
Disagree with statement	1	2	11.1
Agree with statement	2	16	88.9
		-----	-----
Total		18	100.0



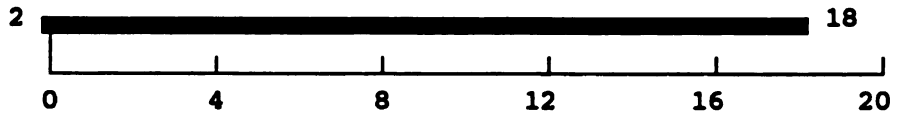
11. Well maintained roads are worth paying for.

Value Label	Value	Frequency	Percent
Agree with statement	2	17	100.0
		-----	-----
Total		17	100.0



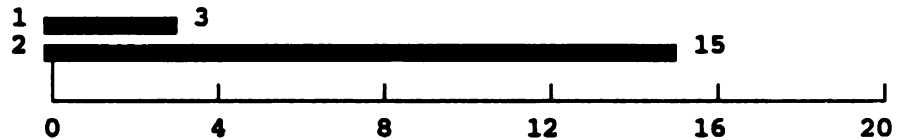
12. Sources of pollution which contaminate our freshwater fish must be found and stopped.

Value Label	Value	Frequency	Percent
Agree with statement	2	18	100.0
		-----	-----
Total		18	100.0



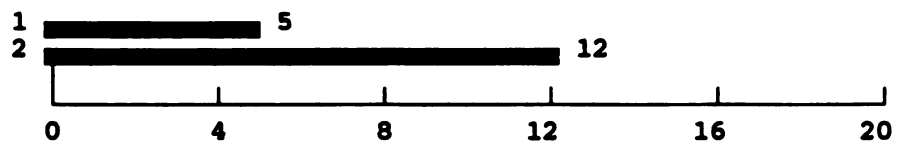
13. Wetlands need to be protected and preserved because they are needed for the survival of wildlife.

Value Label	Value	Frequency	Percent
Disagree with statement	1	3	16.7
Agree with statement	2	15	83.3
		-----	-----
Total		18	100.0



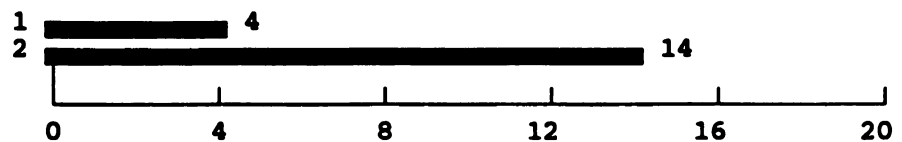
14. Michigan should increase air quality through government regulation.

Value Label	Value	Frequency	Percent
Disagree with statement	1	5	29.4
Agree with statement	2	12	70.6
		-----	-----
Total		17	100.0



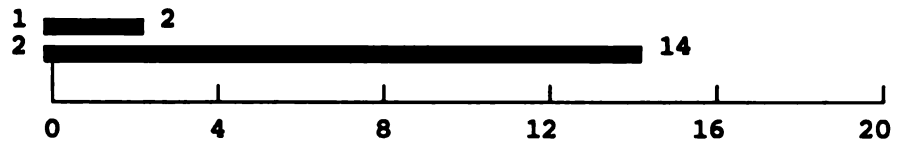
15. Current food safety standards meet consumers' needs.

Value Label	Value	Frequency	Percent
Disagree with statement	1	4	22.2
Agree with statement	2	14	77.8
		-----	-----
Total		18	100.0



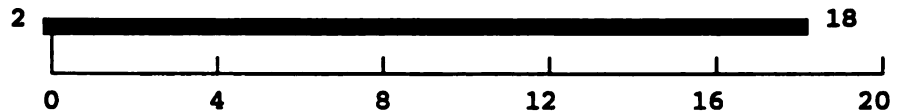
16. Michigan farmers should decrease their use of agricultural chemicals.

Value Label	Value	Frequency	Percent
Disagree with statement	1	2	12.5
Agree with statement	2	14	87.5
		-----	-----
Total		16	100.0



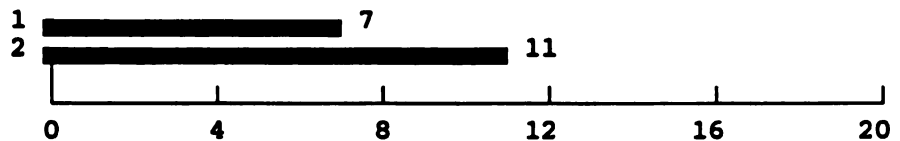
17. Michigan land usage should be based on well developed plans.

Value Label	Value	Frequency	Percent
Agree with statement	2	18	100.0
		-----	-----
Total		18	100.0



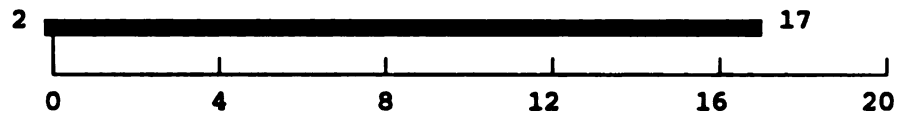
18. Intense logging is sound if replanting is adequate.

Value Label	Value	Frequency	Percent
Disagree with statement	1	7	38.9
Agree with statement	2	11	61.1
		-----	-----
Total		18	100.0



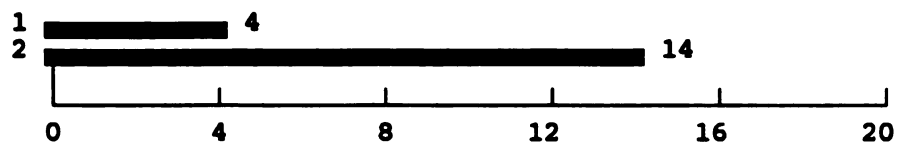
19. Abandoned oil well/drill sites should be restored to their undisturbed state.

Value Label	Value	Frequency	Percent
Agree with statement	2	17	100.0
		-----	-----
Total		17	100.0



20. Because of their importance, the quality of Michigan state parks is the responsibility of all Michigan people.

Value Label	Value	Frequency	Percent
Disagree with statement	1	4	22.2
Agree with statement	2	14	77.8
		-----	-----
Total		18	100.0



## Four-stage Delphi - Questionnaire #4

Variable	Mean	Std Dev	N	Label
Q1	1.28	.46	18	1. Michigan education system
Q2	1.33	.49	18	2. Nuclear energy
Q3	1.94	.24	18	3. Recycling
Q4	2.00	.00	18	4. Alternative to landfills
Q5	1.18	.39	17	5. Toxic waste
Q6	1.72	.46	18	6. Drinking water
Q7	1.94	.24	17	7. Water pollution
Q8	2.00	.00	18	8. Michigan's economy
Q9	2.00	.00	18	9. Property tax reform
Q10	1.89	.32	18	10. Saving farmland
Q11	2.00	.00	17	11. Maintaining roads
Q12	2.00	.00	18	12. Freshwater fish
Q13	1.83	.38	18	13. Wetlands
Q14	1.71	.47	17	14. Air quality
Q15	1.78	.43	18	15. Food safety
Q16	1.87	.34	16	16. Ag. chemicals
Q17	2.00	.00	18	17. Land use
Q18	1.61	.50	18	18. Logging
Q19	2.00	.00	17	19. Oil wells
Q20	1.78	.43	18	20. State parks

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