Bioethanol Fuel Production Concept Study

Topline Report

Marketing Horizons, Inc.
St. Louis, Missouri

National Renewable Energy Laboratory
1617 Cole Boulevard
Golden, Colorado 80401-3393

NREL is a U.S. Department of Energy Laboratory
Operated by Midwest Research Institute • Battelle • Bechtel
Contract No. DE-AC36-99-GO10337
Bioethanol Fuel Production Concept Study

Topline Report

Marketing Horizons, Inc.
St. Louis, Missouri

NREL Technical Monitor: Howard Brown
Prepared under Subcontract No. ACE-1-31061-01
NOTICE

This report was prepared as an account of work sponsored by an agency of the United States government. Neither the United States government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States government or any agency thereof.

Available electronically at http://www.osti.gov/bridge

Available for a processing fee to U.S. Department of Energy and its contractors, in paper, from:
U.S. Department of Energy
Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831-0062
phone: 865.576.8401
fax: 865.576.5728
email: reports@adonis.osti.gov

Available for sale to the public, in paper, from:
U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
phone: 800.553.6847
fax: 703.605.6900
email: orders@ntis.fedworld.gov
online ordering: http://www.ntis.gov/ordering.htm

Printed on paper containing at least 50% wastepaper, including 20% postconsumer waste
INTRODUCTION

**Background:**
- The U.S. Department of Energy (DOE) is in the process of developing technologies for converting plant matter other than feed stock, e.g., corn stover, into biofuels. Bioethanol is the fuel type of interest for this research project. This is being pursued as a cost effective, environmentally friendly alternative fuel source for transportation fuels and fuel additives. Cooperation of farmers in supplying large quantities of corn stover is required for the successful accomplishment of the program objectives.

**Purpose:**
- The overall purpose of this research was to determine how to persuade farmers and other agricultural influentials to support the program.

- Specific issues addressed in the research were:
  - Determine what the farming community thinks of Ethanol as a fuel source, and specifically, bioethanol produced from corn stover
  - Assess the image of the U.S. Department of Energy as a participant in the biofuels program
  - Evaluate the decision process utilized by the farm community regarding the assessment of and participation in the bioethanol program
  - Measure interest of farmers in providing corn stover, including the means and motivation to harvest
  - Determine the perceived impact of potential barriers to participation, such as erosion, available harvesting technology, time and cost to harvest, and changing cultural attitudes toward residue benefits
  - Assess potential benefits, such as, harvesting corn stover as a source of revenue and contributing to the production of an environmentally friendly fuel source.
**Methodology:**

A total of 400 corn growers were interviewed in the following states:

- Illinois .................................................... 68
- Indiana.................................................... 35
- Iowa......................................................... 73
- Kansas .................................................... 20
- Michigan .................................................. 13
- Minnesota............................................... 43
- Missouri .................................................. 17
- Nebraska.................................................. 52
- Ohio.......................................................... 21
- South Dakota ........................................... 25
- Texas ....................................................... 11
- Wisconsin................................................. 22

The interviews were conducted by the professional interviewing staff of Marketing Horizons, Inc. between July 17 and August 1, 2001.

Participants were screened based on the following recruitment criteria:

- Actively involved in farming
- Responsible for making the decisions in their farming operation
- Planted at least 300 acres of corn in 2001
- Between the ages of 25 and 65.

A copy of the questionnaire is included in the Appendix of this report.
KEY FINDINGS

Corn Acreage

- Corn growers who participated in the survey had an average of 653 corn acres. Fifty-five percent had 300 to 500 acres, 22 percent had 501 to 750 acres, and 23 percent had 751 acres or more.

Alternative Fuels

- When prompted, more than three out of four corn growers perceive that the following groups are involved in the research and development of alternative fuels: National Corn Growers Association (95%), State Corn Growers Associations (88%), universities (88%), and U.S. Department of Agriculture (75%). Two out of three respondents believed the U.S. Department of Energy (67%) is involved while only 24 percent perceive any involvement by oil companies.

- On an unaided basis, 19 percent of the growers participating said they believed that the American Soybean Association is involved in the research and development of alternative fuels.

  - Nearly all growers believe that each of these groups, including oil companies, should be promoting Ethanol consumption. And, 86 percent indicated that check-off dollars should be used to promote Ethanol consumption.

  - While only 25 percent of respondents are aware of The National Renewable Energy Laboratory, 44 percent are aware of the U.S. Department of Energy’s BioFuels Program.

Ethanol Produced From Grain

- Nearly all corn growers perceive that the Ethanol program, where Ethanol is produced from grain, is at least somewhat beneficial to them (68%, very beneficial; 22%, somewhat beneficial). They also perceive this program to benefit the environment (60% very beneficial; 31%, somewhat beneficial), elevators and grain producers (55% very beneficial; 31%, somewhat beneficial), and U.S. society in general (50%, very beneficial; 36%, somewhat beneficial).

- More than half of the respondents perceive that the Ethanol program is not at all beneficial to oil companies (65%) and petroleum refiners (52%).
• More than two out of three respondents said that the major benefit resulting from the production and use of Ethanol is cleaner air/less pollution (68%). Other benefits they perceive are an increased demand for corn (38%), independence from foreign oil (34%), and help for the farm economy (34%).

• Seven out of ten corn growers did not report any disadvantages to the production and use of Ethanol. The few respondents who mentioned any disadvantages said it was too expensive (5%), it requires high capital to build the factories that produce it (5%), and it takes away from the food supply (4%).
### Reaction To Statements Regarding Ethanol

- Most growers were likely to agree with the statements regarding benefits to the grower, the country, and the environment:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Somewhat Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have no reservations about selling grain for the production of Ethanol</td>
<td>86%</td>
<td>6%</td>
</tr>
<tr>
<td>Using Ethanol is very beneficial to the environment</td>
<td>62%</td>
<td>31%</td>
</tr>
<tr>
<td>Producing Ethanol can significantly reduce our dependence on foreign oil</td>
<td>60%</td>
<td>26%</td>
</tr>
<tr>
<td>Using Ethanol produced from grain results in higher corn prices for the grower</td>
<td>43%</td>
<td>38%</td>
</tr>
<tr>
<td>The production of Ethanol will increase greatly over the next few years</td>
<td>41%</td>
<td>42%</td>
</tr>
</tbody>
</table>

- Growers were likely to disagree with these statements regarding public information about Ethanol:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The public is well informed about the benefits of using Ethanol as a fuel blend</td>
<td>26%</td>
<td>57%</td>
</tr>
<tr>
<td>Publicity for the promotion of Ethanol has been adequate</td>
<td>21%</td>
<td>49%</td>
</tr>
</tbody>
</table>

- Nearly all corn growers disagreed with the statement:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producing Ethanol from grain is undesirable because it takes away from the food supply</td>
<td>83%</td>
<td>11%</td>
</tr>
</tbody>
</table>
**Corn Stover**

- In 2001, three out of ten corn growers expect to harvest at least some of their corn stover (29%).
  
  - On average, these growers will harvest about one-third of their stover (35%). Most of the growers (62%) who intend to harvest some corn stover reported they will remove 30 percent or less while only 13 percent expect to harvest all of their stover.
  
  - Corn growers who expect to harvest their stover most often said they will bale it (55%) or chop/cut it (11%).
  
  - Growers harvesting their stover most often use their it for animal feed (62%), while fewer use it for bedding (36%), and silage (15%).

- More than one-half of the growers who do not plan to harvest any corn stover in 2001 said they have no use for it (53%). Other reasons for not harvesting stover are soil concerns (35%-net) which include reducing soil fertility (18%), concern about soil tilth (14%), and concern about erosion (11%). Only four percent do not harvest stover because they do not have the equipment.

**The Production Of Ethanol From Corn Stover**

- When growers were given information about a proposed alternative fuel program, Ethanol being produced from corn stover, nearly six out of ten had an initial positive reaction to the overall program (30%, very positive; 29%, somewhat positive).

- Three fourths of the growers surveyed would be likely to sell at least some corn stover for the production of Ethanol if it could be harvested at a reasonable profit (74%).
In order to harvest stover, growers would require an average minimum payment of $42.70 per ton. However, 56 percent of the respondents were unable to provide a minimum payment amount when asked.

- Growers who do not plan to harvest any stover in 2001 would require a higher minimum payment for their stover than were those planning to harvest ($44.30, $39.70 per ton, respectively). Those not planning to harvest were less likely to provide a minimum payment amount than were growers who were already planning to harvest some of their stover.

**Growers Likely To Harvest Corn Stover For Ethanol Production**

- The most frequently given reason for being likely to harvest stover for the production of Ethanol was to add income (70%). Other reasons mentioned by fewer respondents were independence from foreign oil (8%), another use for corn (7%), and no need for corn stover on the farm (5%).

- The primary problems associated with harvesting stover among this group of corn growers likely to harvest stover for the production of Ethanol are a mix of labor/harvesting and soil concerns. Labor/harvesting concerns that were mentioned most frequently were: no way to transport (20%), too much work/labor/time (18%), do not have the equipment (16%), and too expensive to harvest (5%). Soil concerns included losing nutrients/fertilizer (17%), and soil erosion (16%).

- Most growers would harvest at least some of their corn stover from some of their fields (84%). On average, they would want to leave slightly more than a third, (37%) of the stover on the ground.

- After being given information about the proposed program to produce Ethanol from corn stover, growers who would be at least somewhat likely to harvest their stover for Ethanol production increased the percent of stover they would likely harvest by 57 percentage points, on average over what they had previously planned to harvest.

- Growers who currently do not intend to harvest any stover in 2001 said, after being given the Ethanol production from stover program information, they would harvest, on average, 62 percent of their stover to sell for Ethanol production.
Growers Not Likely To Harvest Corn Stover For Ethanol Production

- Corn growers who said they would not be likely to harvest at least some of their corn stover for the production of Ethanol mentioned soil and feed concerns as their reason. These included losing nutrients/fertilizer (35%), fear of soil erosion (34%), use corn stover for silage (7%), and use corn stover to graze cattle (6%). Other reasons were that there was not enough money in it (12%), do not have the equipment (5%), no way to transport it (4%), and too much work/labor/time (3%).

  - Six out of ten growers (59%) who are not likely to sell corn stover for Ethanol production did not perceive any advantages to this concept. The few advantages this group mentioned most frequently were it would be a source of income (16%) and would cut costs on feed and bedding (15%).

Reaction To Statements Regarding The Harvest Of Corn Stover

Erosion Concerns

- While 47 percent of corn growers at least somewhat agreed with the statement, I would have serious erosion problems if I harvested some of my corn stover (17% strongly agree; 30% somewhat agree), 75 percent at least somewhat agreed that although some residue is required to protect the soil from erosion, some residue can be safely removed (33% strongly agree; 42% somewhat agree).

Impact On Soil

- Seventy-one percent at least somewhat agreed that I would have to apply more fertilizer if I harvest some of my corn stover (42%, strongly agree; 29%, somewhat agree).

- Growers are equally divided in their agreement with the statement, I would benefit from removing some of the corn stover because it would allow earlier soil warming (50%, at least somewhat agree; 49%, at least somewhat disagree).

  - Growers in the northern tier states (Michigan, Minnesota, South Dakota, Wisconsin) are significantly more likely to at least somewhat agree with the statement, I would benefit from removing some of the corn stover because it would allow earlier soil warming than were growers in the other states surveyed (59%, at least somewhat agree; 47%, at least somewhat agree, respectively).
2001 Corn Acres
(Base=All Respondents, n=400)

Average 2001 corn acres: 653

Q.C How many acres of corn did you plant this year in 2001?
2001 GMO Corn Acres
(Base=All Respondents, n=400)

Average 2001 GMO corn acres: **172**
Percent of total corn acres planted in GMO corn in 2001: **26%**

Q.D How many of your [Q.C acres] of corn are GMO corn?
Average corn yield per acre: **145 bushels**

Q.E. What is your average corn yield per acre for your operation?
**Typical Crop Rotation**

(Base=All Respondents, n=400)

Q.F. How would you describe your typical crop rotation?
Sources Of Information Utilized To Learn "What's New" In Crop Production Technology

(Base=All Respondents, n=400)

- Mentions of 4% or more -

<table>
<thead>
<tr>
<th>Source Of Information</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm magazines</td>
<td>76%</td>
</tr>
<tr>
<td>Internet</td>
<td>19%</td>
</tr>
<tr>
<td>Dealers</td>
<td>18%</td>
</tr>
<tr>
<td>Farmer meetings</td>
<td>12%</td>
</tr>
<tr>
<td>Company representatives</td>
<td>11%</td>
</tr>
<tr>
<td>University extensions</td>
<td>7%</td>
</tr>
<tr>
<td>Other growers/neighbors</td>
<td>6%</td>
</tr>
<tr>
<td>Television</td>
<td>4%</td>
</tr>
<tr>
<td>DTN</td>
<td>4%</td>
</tr>
<tr>
<td>Radio</td>
<td>4%</td>
</tr>
</tbody>
</table>

Q.1 What sources of information do you generally seek out to learn "what's new" in crop production technology?
Type Of Company Representative Utilized To Learn "What's New" In Crop Production Technology

(Base=Respondents who mentioned company representatives as a source of information, n=43)

- All Mentions -

<table>
<thead>
<tr>
<th>Type Of Company Representative</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed company</td>
<td>58%</td>
</tr>
<tr>
<td>Chemical company</td>
<td>37%</td>
</tr>
<tr>
<td>Fertilizer company</td>
<td>5%</td>
</tr>
</tbody>
</table>

Q.1a Is the company representative for a(n):
Groups Perceived To Be Involved In Research And Development Of Alternative Fuels
- Aided Responses -
(Base=All Respondents, n=400)

Q.2 Which of the following do you believe are involved in the research and development of alternative fuels?
Q.4 What other organizations or agencies do you believe are involved in the research and development of alternative fuels?
Q.3 Are you aware of the National Renewable Energy Laboratory (NREL)?
Q.5 Have you heard of the U.S. Department of Energy's BioFuels Program?
**Perceived Benefit Level Of The Ethanol Program**

To Specific Segments

(Base=All Respondents, n=400)

Q.6 Now please consider the Ethanol program where Ethanol is produced from grain. Using a scale of 1 to 10 where 1 is "not at all beneficial" and 10 is "very beneficial," how beneficial would you say the Ethanol program is to each of the following:
Major Benefits Resulting From The Production And Use Of Ethanol

(Base=All Respondents, n=400)

- Mentions of 4% or more -

Q.7 What do you seed as the major benefits resulting from the production and use of Ethanol?
Disadvantages Of The Production And Use Of Ethanol

(Base=All Respondents, n=400)

- Mentions of 4% or more -

Q.8 What do you feel are the disadvantages of the production and use of Ethanol?
Agreement With Statements Regarding Ethanol
(Base=All Respondents, n=400)

Q.9 I would like to read you a few statements and get your reaction to each. Using a scale of 1 to 10 where 1 is "strongly disagree" and 10 is "strongly agree," how do you rate _____?
Groups That Should Be Promoting Ethanol Consumption

(Base=All Respondents, n=400)

Q.10 Which of the following should be promoting Ethanol consumption? Would you say the:

- National Corn Growers Association (NCGA) 99%
- State Corn Growers Associations 98%
- U.S. Department of Agriculture (U.S.D.A.) 97%
- U.S. Department of Energy 97%
- Farm Cooperatives 97%
- American Farm Bureau Federation 97%
- U.S. Department of Transportation 93%
- EPA 93%
- State Government Agencies 91%
- Oil companies 83%
Groups Perceived To Be Involved In Alternative Fuel Research And Development Versus Groups That Should Be Promoting Ethanol Consumption

(Base=All Respondents, n=400)

<table>
<thead>
<tr>
<th>Involved in Alternative Fuel R &amp; D</th>
<th>Should be Promoting Ethanol Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td></td>
</tr>
<tr>
<td>National Corn Growers Association (NCGA)</td>
<td>95</td>
</tr>
<tr>
<td>State Corn Growers Associations</td>
<td>88</td>
</tr>
<tr>
<td>U.S. Department of Agriculture (U.S.D.A.)</td>
<td>75</td>
</tr>
<tr>
<td>U.S. Department of Energy</td>
<td>67</td>
</tr>
<tr>
<td>Farm Cooperatives</td>
<td>72</td>
</tr>
<tr>
<td>American Farm Bureau Federation</td>
<td>71</td>
</tr>
<tr>
<td>U.S. Department of Transportation</td>
<td>48</td>
</tr>
<tr>
<td>EPA</td>
<td>50</td>
</tr>
<tr>
<td>State Government Agencies</td>
<td>58</td>
</tr>
<tr>
<td>Oil companies</td>
<td>24</td>
</tr>
</tbody>
</table>

Q.2 Which of the following do you believe are involved in the research and development of alternative fuels?
Q.10 Which of the following should be promoting Ethanol consumption? Would you say the:
Incidence Of Agreeing That Check-Off Dollars Should Be Used To Promote Ethanol Consumption

(Base=All Respondents, n=400)

Q.11 Should check-off dollars be used to promote Ethanol consumption?
CORN STOVER SECTION
Q.12 What do you plan to do with your corn stover this year in 2001? Do you plan to:
Q.13 What percent of your corn stover do you plan to harvest?

Percent Of Corn Stover Expected To Be Harvested In 2001
(Base=Respondents who plan to harvest at least some corn stover in 2001, n=115)

Average percent of corn stover expected to be harvested in 2001: 35%
Percent Of Corn Stover Expected To Be Harvested In 2001
(Base=All Respondents, n=400)

Average percent of corn stover expected to be harvested in 2001: 10%

Q.13 What percent of your corn stover do you plan to harvest?
Q.14 How do you plan to bundle your stover after harvest?
Q.15 How do you plan to use the corn stover that you harvest?

Corn Stover Use Intentions

(Base=Respondents who plan to harvest at least some corn stover in 2001, n=115)

- All Mentions -

<table>
<thead>
<tr>
<th>Use</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal feed</td>
<td>62%</td>
</tr>
<tr>
<td>For bedding</td>
<td>36%</td>
</tr>
<tr>
<td>Silage</td>
<td>15%</td>
</tr>
<tr>
<td>Don't know</td>
<td>1%</td>
</tr>
</tbody>
</table>

Percent scale: 0% 20% 40% 60% 80% 100%
Q.16 Why don't you harvest any of your corn stover?
Initial Reaction Of Ethanol Production 
From Corn Stover 
(Base=All Respondents)

Proposed Alternative Fuel Program:
The U.S. Department of Energy, through its Biofuels Program, is in the process of developing the technology to produce alternative transportation fuels and fuel additives. The technology exists to make Ethanol from other plant materials, not just grains, or starches and sugars. One aspect of this program is to utilize corn stover for the production of bioethanol for transportation.

Q.17 What is your initial reaction to having this alternative fuel available? Using a scale of 1 to 10 where 1 is "very negative" and 10 is "very positive," how do you feel overall about the production of Ethanol from corn stover?
Q.18 Knowing what you do about using corn stover for the production of bioethanol for transportation, and if corn stover could be harvested at a reasonable profit, how likely would you be to sell at least some of your corn stover for the production of Ethanol? Would you say you would be:

<table>
<thead>
<tr>
<th>Likelihood Of Selling At Least Some Corn Stover For The Production Of Ethanol If Harvested At A Reasonable Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Base=All Respondents)</td>
</tr>
<tr>
<td>Very likely</td>
</tr>
<tr>
<td>Total (n=400)</td>
</tr>
<tr>
<td>35</td>
</tr>
<tr>
<td>Plan to harvest at least some corn stover in 2001 (n=115)</td>
</tr>
<tr>
<td>34</td>
</tr>
<tr>
<td>Do not plan to harvest any corn stover in 2001 (n=285)</td>
</tr>
<tr>
<td>36</td>
</tr>
</tbody>
</table>
Reasons For Being Likely To Harvest At Least Some Corn Stover For The Production Of Ethanol

(Base = Respondents who would be “very/somewhat likely” to sell corn stover for Ethanol production)

- Mentions of 3% or more -

<table>
<thead>
<tr>
<th>Reason</th>
<th>Total (n=298)</th>
<th>Plan to harvest corn stover in 2001 (n=82)</th>
<th>Do not plan to harvest corn stover in 2001 (n=216)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make money/added income</td>
<td>70%</td>
<td>77%</td>
<td>68%</td>
</tr>
<tr>
<td>Depends on the price</td>
<td>8%</td>
<td>9%</td>
<td>8%</td>
</tr>
<tr>
<td>Independence from foreign oil</td>
<td>8%</td>
<td>5%</td>
<td>9%</td>
</tr>
<tr>
<td>It is another use for corn</td>
<td>7%</td>
<td>4%</td>
<td>9%</td>
</tr>
<tr>
<td>No need for corn stover on farm</td>
<td>5%</td>
<td>4%</td>
<td>5%</td>
</tr>
<tr>
<td>Concerned about soil erosion*</td>
<td>3%</td>
<td>4%</td>
<td>2%</td>
</tr>
</tbody>
</table>

* Explains “somewhat likely” response

Q.19 Why would you be very/somewhat likely to sell at least some of your stover for the production of Ethanol?
## Problems Associated With Harvesting Corn Stover

(Base = Respondents who would be “very/somewhat likely” to sell corn stover for Ethanol production)

- Mentions of 3% or more -

<table>
<thead>
<tr>
<th>Problem</th>
<th>Total  (n=298)</th>
<th>Plan to harvest corn stover in 2001 (n=82)</th>
<th>Do not plan to harvest corn stover in 2001 (n=216)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No way to transport</td>
<td>20%</td>
<td>21%</td>
<td>19%</td>
</tr>
<tr>
<td>Too much work/labor/time</td>
<td>18%</td>
<td>16%</td>
<td>19%</td>
</tr>
<tr>
<td>Lose nutrients/fertilizer</td>
<td>17%</td>
<td>11%</td>
<td>19%</td>
</tr>
<tr>
<td>Don’t have the equipment</td>
<td>16%</td>
<td>13%</td>
<td>17%</td>
</tr>
<tr>
<td>Soil erosion</td>
<td>12%</td>
<td>9%</td>
<td>13%</td>
</tr>
<tr>
<td>Weather</td>
<td>9%</td>
<td>17%</td>
<td>6%</td>
</tr>
<tr>
<td>Too expensive to harvest</td>
<td>5%</td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td>No storage</td>
<td>3%</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>None</td>
<td>20%</td>
<td>23%</td>
<td>19%</td>
</tr>
<tr>
<td>Don't know</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
</tr>
</tbody>
</table>

Q.20 What, if any, problems do you associate with harvesting your stover?
Q.21 Which of the following best describes how you would harvest your corn stover? Would you be most likely to:

**Description Of How Corn Stover Would Be Harvested**

(Base=Respondents who would be "very/somewhat likely" to sell corn stover for Ethanol production, n=298)

- Harvest at least some of the stover from ALL of corn fields
- Harvest at least some of the stover from SOME of corn fields
- Don’t know

<table>
<thead>
<tr>
<th>Description Of How Corn Stover Would Be Harvested</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvest at least some of the stover from ALL of corn fields</td>
<td>14</td>
</tr>
<tr>
<td>Harvest at least some of the stover from SOME of corn fields</td>
<td>84</td>
</tr>
<tr>
<td>Don’t know</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description Of How Corn Stover Would Be Harvested</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvest at least some of the stover from ALL of corn fields</td>
<td>12</td>
</tr>
<tr>
<td>Harvest at least some of the stover from SOME of corn fields</td>
<td>86</td>
</tr>
<tr>
<td>Don’t know</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description Of How Corn Stover Would Be Harvested</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvest at least some of the stover from ALL of corn fields</td>
<td>15</td>
</tr>
<tr>
<td>Harvest at least some of the stover from SOME of corn fields</td>
<td>83</td>
</tr>
<tr>
<td>Don’t know</td>
<td>2</td>
</tr>
</tbody>
</table>

Plan to harvest at least some corn stover in 2001 (n=115)

Do not plan to harvest any corn stover in 2001 (n=285)
Percent Of Corn Stover Growers Would Leave On Fields
(Base=Respondents who would be "very/somewhat likely" to sell corn stover for Ethanol production)

Q.22 On those fields where you plan to harvest at least some of the stover, what percent of the stover would you want to leave on your fields?
Q.13 What percent of your corn stover do you plan to harvest?
Q.22 On those fields where you plan to harvest at least some of the stover, what percent of the stover would you want to leave on your fields?
Reasons For Not Being Likely To Harvest At Least Some Corn Stover For The Production Of Ethanol

(Base = Respondents who would be “not too/not at all likely” to sell corn stover for Ethanol production)

- Mentions of 3% or more -

<table>
<thead>
<tr>
<th>Reason</th>
<th>Total (n=102)</th>
<th>Plan to harvest corn stover in 2001 (n=33)</th>
<th>Do not plan to harvest corn stover in 2001 (n=69)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lose nutrients/fertilizer</td>
<td>35%</td>
<td>30%</td>
<td>38%</td>
</tr>
<tr>
<td>Fear of soil erosion</td>
<td>34%</td>
<td>27%</td>
<td>38%</td>
</tr>
<tr>
<td>Not enough money in it</td>
<td>12%</td>
<td>6%</td>
<td>14%</td>
</tr>
<tr>
<td>Use corn stover for silage</td>
<td>7%</td>
<td>18%</td>
<td>1%</td>
</tr>
<tr>
<td>Use corn stover to graze cattle</td>
<td>6%</td>
<td>9%</td>
<td>4%</td>
</tr>
<tr>
<td>Have a surplus of corn, wheat and soybeans</td>
<td>5%</td>
<td>3%</td>
<td>6%</td>
</tr>
<tr>
<td>Don't have the equipment</td>
<td>5%</td>
<td>3%</td>
<td>6%</td>
</tr>
<tr>
<td>No way to transport</td>
<td>4%</td>
<td>6%</td>
<td>3%</td>
</tr>
<tr>
<td>Too much work/labor/time</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Q.23 Why would you not be likely to harvest at least some of your corn stover for the production of Ethanol?
Advantages Associated With Harvesting Corn Stover

(Base = Respondents who would be “not too/not at all likely” to sell corn stover for Ethanol production)

- Mentions of 3% or more -

<table>
<thead>
<tr>
<th>Advantage</th>
<th>Total (n=102)</th>
<th>Plan to harvest corn stover in 2001 (n=33)</th>
<th>Do not plan to harvest corn stover in 2001 (n=69)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source of income</td>
<td>16%</td>
<td>15%</td>
<td>16%</td>
</tr>
<tr>
<td>Cut costs on feed and bedding</td>
<td>15%</td>
<td>33%</td>
<td>6%</td>
</tr>
<tr>
<td>No “trash” on fields</td>
<td>4%</td>
<td>6%</td>
<td>3%</td>
</tr>
<tr>
<td>Eliminate disease and insect problems</td>
<td>3%</td>
<td>--</td>
<td>4%</td>
</tr>
<tr>
<td>None</td>
<td>53%</td>
<td>27%</td>
<td>65%</td>
</tr>
<tr>
<td>Don't know</td>
<td>6%</td>
<td>9%</td>
<td>4%</td>
</tr>
</tbody>
</table>

Q.24 What, if any, advantages do you associate with harvesting your stover?
Q.25 What is the minimum you would have to be paid per ton, in order to harvest your corn stover?
Minimum Payment Per Ton Growers Would Require To Harvest Corn Stover
- Excluding "Don't Know" Responses -

(Base=All Respondents)

<table>
<thead>
<tr>
<th>Percent</th>
<th>Zero</th>
<th>$25 or less</th>
<th>$26 to $50</th>
<th>$51 to $75</th>
<th>More than $75</th>
<th>Average Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total (n=175)</td>
<td>2</td>
<td>35</td>
<td>45</td>
<td>8</td>
<td>10</td>
<td>$42.70</td>
</tr>
<tr>
<td>Plan to harvest at least some corn stover in 2001 (n=63)</td>
<td>33</td>
<td>54</td>
<td>5</td>
<td>8</td>
<td>$39.70</td>
<td></td>
</tr>
<tr>
<td>Do not plan to harvest any corn stover in 2001 (n=112)</td>
<td>36</td>
<td>40</td>
<td>10</td>
<td>11</td>
<td>$44.30</td>
<td></td>
</tr>
</tbody>
</table>

Q.25 What is the minimum you would have to be paid per ton, in order to harvest your corn stover?
Q.26 Again, I would like to read you a few statements and get your reaction to each? Using a scale of 1 to 10 where 1 is "strongly disagree" and 10 is "strongly agree," how do you rate ______?
Level Of Agreement With Various Statements Regarding The Harvesting Of Corn Stover

- I Would Definitely Harvest Stover For The Production Of Ethanol If There Were A Service To Harvest And Transport The Stover -

(Base=All Respondents)

Q.26 Again, I would like to read you a few statements and get your reaction to each? Using a scale of 1 to 10 where 1 is "strongly disagree" and 10 is "strongly agree," how do you rate "I would definitely harvest stover for the production of Ethanol if there were a service to harvest and transport the stover?"
Level Of Agreement With Various Statements Regarding The Harvesting Of Corn Stover - I Would Benefit From Removing Some Of The Corn Stover Because It Would Allow Earlier Soil Warming -

(Base=All Respondents)

Q.26 Again, I would like to read you a few statements and get your reaction to each? Using a scale of 1 to 10 where 1 is "strongly disagree" and 10 is "strongly agree," how do you rate "I would benefit from removing some of the corn stover because it would allow earlier soil warming?"


Reaction To The U.S. Department Of Energy’s Involvement In The Ethanol From Corn Stover Program

(Base = All respondents)

- Mentions of 3% or more -

<table>
<thead>
<tr>
<th></th>
<th>Total (n=400)</th>
<th>Plan to harvest corn stover in 2001 (n=115)</th>
<th>Do not plan to harvest corn stover in 2001 (n=285)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No objections/okay/fine</td>
<td>35%</td>
<td>36%</td>
<td>35%</td>
</tr>
<tr>
<td>Good idea</td>
<td>29%</td>
<td>32%</td>
<td>27%</td>
</tr>
<tr>
<td>Need to be involved to help the farmers</td>
<td>10%</td>
<td>11%</td>
<td>9%</td>
</tr>
<tr>
<td>Should not be involved</td>
<td>5%</td>
<td>3%</td>
<td>6%</td>
</tr>
<tr>
<td>Not a good idea</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Don't know</td>
<td>4%</td>
<td>5%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Q.27 What is your reaction to having the U.S. Department Of Energy involved in the Ethanol stover program?
Effect That The U.S. Department Of Energy's Involvement Would Have On Decision To Harvest Corn Stover For Ethanol Production

(Base=All Respondents)

Q.28 Knowing that the U.S. Department of Energy is developing this technology, what effect would that have on your decision to harvest your corn stover for the production of Ethanol. Would you say it would have a:
Q.29 Have you been involved in the production of Ethanol in any of the following ways? Have you:

- Attended a meeting to discuss Ethanol production: 51%
- Sold grain specifically for Ethanol production: 26%
- Invested in the construction of a facility for the production of Ethanol: 18%
Q.29 Have you been involved in the production of Ethanol in any of the following ways? Have you:

- Sold Grain Specifically For Ethanol Production -

- Plan to harvest at least some corn stover in 2001 (n=115)
- Do not plan to harvest any corn stover in 2001 (n=285)
Q.29 Have you been involved in the production of Ethanol in any of the following ways? Have you:

- Attended a meeting to discuss Ethanol production -

   *Total (n=400) 51%*

   - Plan to harvest at least some corn stover in 2001 (n=115) 46%
   - Do not plan to harvest any corn stover in 2001 (n=285) 53%
Q.29 Have you been involved in the production of Ethanol in any of the following ways? Have you:

- Invested In The Construction Of A Facility For The Production Of Ethanol

(Base=All Respondents)

- Total (n=400) - 18%
- Plan to harvest at least some corn stover in 2001 (n=115) - 22%
- Do not plan to harvest any corn stover in 2001 (n=285) - 16%
**Tillage Practices For 2001 Corn Acres**

(Base=All Respondents)

<table>
<thead>
<tr>
<th>Average percent of acres</th>
<th>Total (n=400)</th>
<th>Plan to harvest at least some corn stover in 2001 (n=115)</th>
<th>Do not plan to harvest any corn stover in 2001 (n=285)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No-till</td>
<td>24</td>
<td>28</td>
<td>23</td>
</tr>
<tr>
<td>Reduced till</td>
<td>45</td>
<td>46</td>
<td>45</td>
</tr>
<tr>
<td>Conventional till</td>
<td>31</td>
<td>26</td>
<td>32</td>
</tr>
</tbody>
</table>

Q.30 What percent of your 2001 corn acres are:
**Tillage Practices For 2001 Corn Acres**

(Base=All Respondents, n=400)

Q.30 What percent of your 2001 corn acres are:

- **No-till**
  - Zero: 59%
  - 1-24%: 8%
  - 25-49%: 7%
  - 50-74%: 6%
  - 75-99%: 6%
  - 100%: 14%

- **Reduced till**
  - Zero: 41%
  - 1-24%: 6%
  - 25-49%: 4%
  - 50-74%: 10%
  - 75-99%: 6%
  - 100%: 33%

- **Conventional till**
  - Zero: 63%
  - 1-24%: 4%
  - 25-49%: 3%
  - 50-74%: 4%
  - 75-99%: 21%
Q.31 Which of the following types of crop land do you have for corn? Do you have:
Q.32 What percent of your corn acres are: Flat, rolling, but highly erodible, or highly erodible?

Type Of Crop Land For Corn

(Base=All Respondents, n=400)

<table>
<thead>
<tr>
<th>Flat</th>
<th>Rolling, but not highly erodible</th>
<th>Highly erodible</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>29</td>
<td>57</td>
</tr>
<tr>
<td>8</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>12</td>
<td>21</td>
<td>11</td>
</tr>
<tr>
<td>19</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>18</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>22</td>
<td>9</td>
<td>4</td>
</tr>
</tbody>
</table>

Percent Of Corn Acres

- Flat: 53%
- Rolling, but not highly erodible: 32%
- Highly erodible: 14%
**Erosion Concerns Or Challenges**

(Base=All Respondents)

<table>
<thead>
<tr>
<th></th>
<th>Wind erosion</th>
<th>Run off erosion</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total (n=400)</td>
<td>27</td>
<td>70</td>
<td>3</td>
</tr>
<tr>
<td>Plan to harvest at least some corn stover in 2001 (n=115)</td>
<td>20</td>
<td>77</td>
<td>3</td>
</tr>
<tr>
<td>Do not plan to harvest any corn stover in 2001 (n=285)</td>
<td>30</td>
<td>67</td>
<td>3</td>
</tr>
</tbody>
</table>

Q33 Which would be of greatest concern or challenge to your farming operation? Would you say:
Incidence Of Using Ethanol Blend Gasoline In Vehicles
(Base=All Respondents)

Percent Using

Total (n=400) 77%

Plan to harvest at least some corn stover in 2001 (n=115) 72%

Do not plan to harvest any corn stover in 2001 (n=285) 79%

Q.34 Do you currently use Ethanol blend gasoline in any of your vehicles?
**Incidence Of Using Various Ethanol Types**

(Base=Respondents who use any Ethanol blend gasoline in their vehicles)

![Graph showing the incidence of using various ethanol types.](image)

Q.35  Do you use E100?
Q.36  Do you use E85 or E95?
Q.37  Do you use any blend with less than 85% ethanol?

[ Page 51 ]
Incidence Of Using Soy Diesel Blend Fuel In Vehicles
(Base=All Respondents)

Q.38 Do you currently use Soy Diesel blend fuels in any of your vehicles?
Hello my name is _______ with Marketing Horizons, an agricultural marketing research firm. We are talking with corn growers in your area about alternative fuel sources and would like to include your opinions. Please be assured I’m not trying to sell you anything and that any information you provide will be kept confidential.

A. Are you actively involved in farming?

   Yes............................. (___)
   No.............................. (___) – Thank and terminate

B. Are you the person who makes the decisions regarding the operations of your farm?

   Yes............................. (___)
   No.............................. (___) – Ask for the appropriate person

C. How many acres of corn did you plant this year in 2001?

   ____________________ acres
   [If less than 300 acres thank and terminate]

D. How many of your [Q.C acres] of corn are GMO corn?

   ____________________ acres

[ Page A-2 ]
E. What is your average corn yield per acre for your operation?

_______________

F. How would you describe your typical crop rotation?

Year 1: ______________________
Year 2: ______________________
Year 3: ______________________

G. And, which of the following includes your age?

   Under 25................................. (__) - Thank and terminate
   25 to 35................................. (__) 
   36 to 45................................. (__) 
   46 to 55................................. (__) 
   56 to 65................................. (__) 
   Over 65................................. (__) - Thank and terminate
1. What sources of information do you generally seek out to learn “what’s new” in crop production technology? [Do not read list]

   a. ( ) Company reps*
   b. ( ) County agents
   c. ( ) Dealers
   d. ( ) DTN
   e. ( ) EPA
   f. ( ) Farm magazines
   g. ( ) Farmer meetings
   h. ( ) Government agents
   i. ( ) Internet
   j. ( ) National Resources Conservation Service (NRCS)
   k. ( ) Other growers/neighbors
   l. ( ) Radio
   m. ( ) Television
   n. ( ) Trade shows
   o. ( ) University extensions
   p. ( ) U.S. Department of Agriculture (U.S.D.A.)
   q. ( ) Other__________________________
      [specify]

[* If Company reps mentioned in Q.1 >> ask]

   1a. Is the company rep for a(n):

      ( ) Equipment company
      ( ) Seed company
      ( ) Chemical Company
2. Which of the following do you believe are involved in the research and development of alternative fuels?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. U.S. Department of Agriculture (U.S.D.A.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. U.S. Department of Energy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Oil companies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. National Corn Growers Association (NCGA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. U.S. Department of Transportation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. State Corn Growers Association</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Farm Coops</td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. American Farm Bureau Federation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. State government agencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>j. EPA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>k. University in your state</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Are you aware of the National Renewable Energy Laboratory (NREL)?

Yes................................. ( )
No................................. ( )

4. What other organizations or agencies do you believe are involved in the research and development of alternative fuels?

_____________________________________________________________________
_____________________________________________________________________

5. Have you heard of the U.S. Department of Energy’s BioFuels Program?

Yes................................. ( )
No................................. ( )
6. Now please consider the Ethanol program where Ethanol is produced from grain. Using a scale of 1 to 10 where 1 is “not at all beneficial” and 10 is “very beneficial,” how beneficial would you say the Ethanol program is to each of the following:

<table>
<thead>
<tr>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Corn growers ........................................... (___)</td>
</tr>
<tr>
<td>b. The environment ........................................ (___)</td>
</tr>
<tr>
<td>c. U.S. society in general .............................. (___)</td>
</tr>
<tr>
<td>d. Oil companies ............................................ (___)</td>
</tr>
<tr>
<td>e. Petroleum refines ...................................... (___)</td>
</tr>
<tr>
<td>f. Gasoline and fuel retailers ......................... (___)</td>
</tr>
<tr>
<td>g. Elevators and grain producers ..................... (___)</td>
</tr>
</tbody>
</table>

7. What do you see as the major benefits resulting from the production and use of Ethanol?

______________________________________________________________________
______________________________________________________________________
______________________________________________________________________

8. What do you feel are the disadvantages of the production and use of Ethanol?

______________________________________________________________________
______________________________________________________________________
______________________________________________________________________
9. I would like to read you a few statements and get your reaction to each. Using a scale of 1 to 10 where 1 is “strongly disagree” and 10 is “strongly agree,” how do you rate______?

[Rotate]

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Producing Ethanol can significantly reduce our dependence on foreign oil</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>b. Using Ethanol is very beneficial to the environment</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>c. Using Ethanol produced from grain results in higher corn prices for the grower</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>d. I have no reservations about selling grain for the production of Ethanol</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>e. The public is well informed about the benefits of using ethanol as a fuel blend</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>f. The production of Ethanol will increase greatly over the new few years</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>g. Producing Ethanol from grain is undesirable because it takes away from the food supply</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>h. Publicity for the promotion of Ethanol has been adequate</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
</tbody>
</table>

10. Which of the following should be promoting Ethanol consumption? Would you say the:

[Rotate]

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. U.S. Department of Energy</td>
<td>( )-1 ( )-2</td>
<td></td>
</tr>
<tr>
<td>c. Oil companies</td>
<td>( )-1 ( )-2</td>
<td></td>
</tr>
<tr>
<td>d. National Corn Growers Association (NCGA)</td>
<td>( )-1 ( )-2</td>
<td></td>
</tr>
<tr>
<td>e. U.S. Department of Transportation</td>
<td>( )-1 ( )-2</td>
<td></td>
</tr>
<tr>
<td>f. State Corn Growers Association</td>
<td>( )-1 ( )-2</td>
<td></td>
</tr>
<tr>
<td>g. Farm Coops</td>
<td>( )-1 ( )-2</td>
<td></td>
</tr>
<tr>
<td>h. American Farm Bureau Federation</td>
<td>( )-1 ( )-2</td>
<td></td>
</tr>
<tr>
<td>i. State government agencies</td>
<td>( )-1 ( )-2</td>
<td></td>
</tr>
<tr>
<td>j. EPA</td>
<td>( )-1 ( )-2</td>
<td></td>
</tr>
</tbody>
</table>

11. Should check-off dollars be used to promote Ethanol consumption?

Yes................................................. ( )
No................................................. ( )

[ Page A-7 ]
Now I would like to talk to you about your corn stover. For the purposes of this survey, we define corn stover as husks, stalks, cobs, leaves - all parts of the plant except the grain.

12. What do you plan to do with your corn stover this year in 2001? Do you plan to:

Harvest at least some of it .................... ( )
Will not harvest any of it .................... ( ) -- Skip to Q.16

13. What percent of your corn stover do you plan to harvest?

___________________ %

14. How do you plan to bundle your stover after harvest?

[Do not read list]

a. ( ) Bale
b. ( ) Cube
c. ( ) Other _____________________________
   [Specify]

15. How do you plan to use the corn stover that you harvest?

[Do not read list]

a. ( ) For bedding
b. ( ) Animal feed
c. ( ) Silage
d. ( ) Other _____________________________
   [Specify]

[Skip to Q.17]
16. Why don’t you harvest any of your corn stover?

[Do not read list]

   a. ( ) No use for corn stover
   b. ( ) Concerned about erosion
   c. ( ) Don’t have time to harvest
   d. ( ) Don’t have the equipment to harvest
   e. ( ) Concern about soil tilth
   f. ( ) Concern about reducing soil fertility
   d. ( ) Other _____________________________

   [Specify]

17. What is your initial reaction to having this alternative fuel available? Using a scale of 1 to 10 where 1 is “very negative” and 10 is “very positive,” how do you feel overall about the production of Ethanol from corn stover?

<table>
<thead>
<tr>
<th>Very Negative</th>
<th>Very Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
</tbody>
</table>

18. Knowing what you do about using corn stover for the production of bioethanol for transportation, and if corn stover could be harvested at a reasonable profit, how likely would you be to sell at least some of your corn stover for the production of Ethanol? Would you say you would be:

   Very likely ........................................ ( )
   Somewhat likely .................................. ( ) -- Skip to Q.23
   Not too likely ................................. ( ) -- Skip to Q.23
   Not at all likely .............................. ( ) -- Skip to Q.23
[Ask Q.19 through Q.22 of those “very/somewhat likely” in Q.18]

19. Why would you be [very likely/somewhat likely] to sell at least some of your stover for the production of Ethanol?

______________________________________________________________________
______________________________________________________________________
______________________________________________________________________

20. What, if any, problems do you associate with harvesting your stover?

______________________________________________________________________
______________________________________________________________________
______________________________________________________________________

21. Which of the following best describes how you would harvest your corn stover? Would you be most likely to:

(____) Harvest at least some of the stover from all of your corn fields

OR

(____) Harvest at least some of your stover from some of your corn fields

22. On those fields where you plan to harvest at least some of the stover, what percent of the stover would you want to leave on your fields?

________________% 

[Skip to Q.25]
23. Why would you not be likely to harvest at least some of your corn stover for the production of Ethanol?

______________________________________________________________________
______________________________________________________________________
______________________________________________________________________

24. What, if any, advantages do you associate with harvesting your stover?

______________________________________________________________________
______________________________________________________________________
______________________________________________________________________

25. What is the minimum you would have to be paid per ton, in order to harvest your corn stover?

$__________________
26. Again, I would like to read you a few statements and get your reaction to each. Using a scale of 1 to 10 where 1 is “strongly disagree” and 10 is “strongly agree,” how do you rate ________?

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>I would definitely harvest stover for the production of Ethanol if there were a service to harvest and transport the stover</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>b.</td>
<td>I would have to apply more fertilizer if I harvest some of my corn stover</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>c.</td>
<td>I would have serious erosion problems if I harvested some of my corn stover</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>d.</td>
<td>Although some residue is required to protect the soil from erosion, some residue can be safely removed</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>e.</td>
<td>Since planting corn-on-corn produces a buildup of corn stover, harvesting corn stover is more advantageous for growers who plant corn-on-corn</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>f.</td>
<td>Excessive corn stover residue reduces crop yields in no-till farming</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>g.</td>
<td>Excessive residue contributes to problems with weeds, diseases, and pests</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>h.</td>
<td>Producing Ethanol from corn stover would benefit the farmer, processor, and environment</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>i.</td>
<td>Since herbicides and pesticides are partially absorbed by the corn stover, control is more difficult and expensive</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>j.</td>
<td>There would be no difference between Ethanol produced from corn stover and Ethanol produced from grain</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>k.</td>
<td>Growers would be less likely to harvest stover from Bt corn than from conventional corn</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>l.</td>
<td>I would benefit from removing some of the corn stover because it would allow earlier soil warming</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>m.</td>
<td>Stover would not likely be removed from no-till acres</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
</tbody>
</table>
27. As I indicated earlier, the U.S. Department of Energy is developing the technology for the production of Ethanol from corn stover. What is your reaction to having the U.S. Department of Energy involved in the Ethanol from stover program?

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

28. Knowing that the U.S. Department of Energy is developing this technology, what effect would that have on your decision to harvest your corn stover for the production of Ethanol. Would you say it would have a:

- Very positive effect ................................................... ( )
- Somewhat positive effect ........................................... ( )
- Neither a positive nor a negative effect ....................... ( )
- Somewhat negative effect ......................................... ( )
- Very negative effect .................................................. ( )

29. Have you been involved in the production of Ethanol in any of the following ways? Have you:

Yes No
a. Sold grain specifically for Ethanol production.............. ( )-1 ( )-2
b. Attended a meeting to discuss Ethanol production ....... ( )-1 ( )-2
c. Invested in the construction of a facility for the production of Ethanol......................................................... ( )-1 ( )-2

30. What percent of your 2001 corn acres are:

- No-till %
- Reduced till %
- Conventional till %
31. Which of the following types of crop land do you have for corn? Do you have:

32. What percentage of your corn acres are:

<table>
<thead>
<tr>
<th>Q.31</th>
<th>Q.32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Flat</td>
<td></td>
</tr>
<tr>
<td>Rolling, but not highly erodible</td>
<td></td>
</tr>
<tr>
<td>Highly erodible</td>
<td></td>
</tr>
</tbody>
</table>

33. Which would be of greater concern or challenge to your farming operation? Would you say:

Wind erosion .................................................. ( )
Run off erosion..................................................

34. Do you currently use Ethanol blend gasoline in any of your vehicles?

Yes......................................... ( )
No.......................................... ( ) -- Skip to Q.38

35. Do you use E100?

Yes......................................... ( )
No.......................................... ( )

36. Do you use E85 or E95 ethanol blends?

Yes......................................... ( )
No.......................................... ( )

37. Do you use any blend with less than 85% ethanol?

Yes......................................... ( )
No.......................................... ( )
38. Do you currently use Soy Diesel blend fuels in any of your vehicles?

Yes......................................... (___)
No.............................................. (___)

That is all my questions for today, thank you for your time.
# Bioethanol Fuel Production Concept Study-Topline Report

## 1. Agency Use Only (Leave blank)

## 2. Report Date
November 2001

## 3. Report Type and Dates Covered
Subcontract report

## 4. Title and Subtitle
Bioethanol Fuel Production Concept Study-Topline Report

## 5. Funding Numbers
BFP1A501

## 6. Author(s)

## 7. Performing Organization Name(s) and Address(es)
Marketing Horizons Inc.
St. Louis, Missouri

## 8. Performing Organization Report Number

## 9. Sponsoring/Monitoring Agency Name(s) and Address(es)
National Renewable Energy Laboratory
1617 Cole Blvd.
Golden, CO 80401-3393

## 10. Sponsoring/Monitoring Agency Report Number
NREL/SR-510-31247

## 11. Supplementary Notes
NREL Technical Monitor: Howard Brown

## 12a. Distribution/Availability Statement
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road
Springfield, VA 22161

## 12b. Distribution Code

## 13. Abstract (Maximum 200 words)
The DOE is in the process of developing technologies for converting plant matter other than feedstock, e.g., corn stover, into biofuels. The goal of this research project was to determine what the farming community thinks of ethanol as a fuel source, and specifically what they think of bioethanol produced from corn stover. This project also assessed the image of the DOE and the biofuels program and determined the perceived barriers to ethanol-from-stover production.

## 14. Subject Terms
- stover survey
- stover
- farmers
- ethanol production
- ethanol from grain
- ethanol from stover

## 15. Number of Pages

## 16. Price Code

## 17. Security Classification of Report
Unclassified

## 18. Security Classification of This Page
Unclassified

## 19. Security Classification of Abstract
Unclassified

## 20. Limitation of Abstract
UL