Consumer Willingness to Pay for Sustainable Agricultural Practices in Upstate South Carolina

Ashley Razo
Dr. Karen Allen, Dr. Courtney Quinn, and Dr. John Quinn
Furman University, Department of Earth, Environmental, and Sustainable Science, Greenville, SC 29613

Introduction

- My research project aims to figure out consumers willingness to pay (WTP) for sustainable agricultural practices in Upstate South Carolina
- I have established a choice experimental survey that was used to determine consumers WTP. From a selection of varied land management scenarios and their impact on a weekly food bill, consumers choose their preferred scenario. This choice will determine their WTP for sustainable practices.
- The survey was distributed in two methods: at different farmers markets in the Upstate area and through an Online distributor (Qualtrics).
- The results from the survey distribution have recently come in, and the data analyzation process has begun. I aim to continue this process to further investigate the results.

Attributes

From recent scientific literature, the practices that farmers have already implemented, and directly speaking to Upstate consumers, the following five attributes where chosen:

Attributes	How Consumers Understand	Levels	SQ
Pest Management	Chemical Substances	- Integrated (1) - Conventional (-1)	-1
Animal Welfare	Animal Welfare	- Humane (1) - Conventional (-1)	-1
Soil Conservation	Soil Quality	- Thick soil (healthy) (1) - Thin soil (unhealthy) (-1)	-1
Water Quality	Water Conservation	- Percentage of land dedicated to buffers: 5%, 10%, 15%, 20%	0
Habitat Diversity	Contribution to Biodiversity	-Yes (1) -No (-1)	0
Cost	Increased Weekly Payment	- $10, $20, $30, $40, $50, $60, $70, $80	0

Figure 1. The table consists of each attribute, how we interpret consumers to understand these practices, the levels of each attribute, and how the levels as well as the status quo are coded to run multiple different analysis tests such as a CLOGIT test.

Survey Design

Choice Experiment Survey

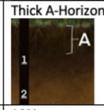
	Scenario 1	Scenario 2	Neither Scenario
Pest Management	Conventional 	Integrated 	
Animal Welfare	Conventional 	Conventional 	
Soil Conservation	Thick A-Horizon 	Thin A-Horizon 	
Percentage of land dedicated to buffers	10%	10%	
Certified Habitat Friendly	Pollinator 	Bird 	
Weekly Food Bill Increase	$70	$40	$0

Figure 2. An example of a choice experimental scenario in the survey. As shown, the consumer is given different variations of how land is managed on a farm, and the impact that these practices will have on their costs. Consumers can choose between the first scenario, the second scenario, and the status quo. Throughout the survey, the consumer is presented with four different choice experiments, each with their own two distinct scenarios.

Informational Insert

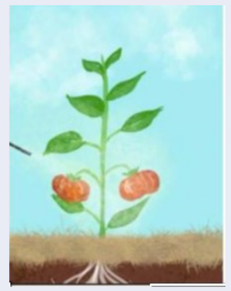
Consumers are provided with an insert that includes the descriptions of the attributes, the different levels, and the images that are used to represent these attribute levels in the survey. Here are some of the attribute details included in the insert:

Integrated Pest Management (IPM)

Controlling insects, diseases, and weeds without the use of chemicals. IPM involves the combination of disease-resistant crop varieties and biological controls (such as natural predators/parasites that keep pest populations below harmful levels).

Conventional Pest Management

Elimination of pests through chemical pesticides and herbicides. While these chemical inputs are regulated by the Environmental Protection Agency, in large quantities they may have negative effects on humans, animals, and the environment.



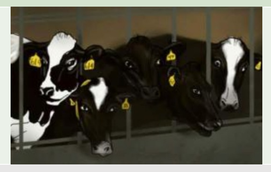
Certified Humane Standards

Humane treatment is followed from birth through slaughter and includes:

- Animals are rarely kept in cages, crates, or tie stalls.
- Animals must be fed a diet of quality feed without antibiotics or growth hormones.

Conventional Standards

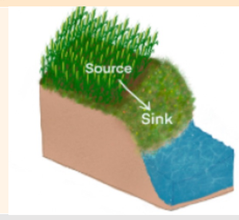
Conventionally raised animals rarely have access to outdoors. While conventional farming and breeding produces high-yielding animals, the excessive numbers and high density at which animals are held lead these animals to be more prone to diseases, and therefore require more medical treatments.



Buffer

Slows water runoff, traps sediment, enhances water infiltration in the buffer itself, and improves the quality of nearby bodies of water.

Measured as a percentage from 5% to 20%



Results

For the first tests done on this dataset, the econometric and statistical software package extension NLOGIT was used. Several CLOGIT (conditional fixed-effects logistic regression) tests were ran, as CLOGIT can compute robust and cluster-robust standard errors and adjust results for complex survey designs. These assessments were done to understand consumers preferences based on different attributes. So far, the results show that people would want to pay for better sustainable agricultural practices at the least amount of cost.

OPTION	Coefficient	Standard Error	z	Prob. |z|>Z*	95% Confidence Interval
PEST_M	.48839***	.06173	7.91	.0000	.36741 .60937
ANIMAL_W	1.11905***	.07060	15.85	.0000	.98068 1.25742
SOIL_C	.23891***	.06174	3.87	.0001	.11789 .35992
BUFFERS	.01453**	.00601	2.42	.0157	.00274 .02631
HABITAT_	.20373***	.07217	2.82	.0048	.06229 .34517
COST	-.01288***	.00149	-8.65	.0000	-.01580 -.00996
SQASC	-.19260	.12793	-1.51	.1322	-.44334 .05813

***, **, * ==> Significance at 1%, 5%, 10% level.

Figure 3. Results from a basic CLOGIT model that is analyzing surveyors as one big group. Overall, all attributes appear to be significant which corresponds with an insignificant preference towards the status quo.

OPTION	Coefficient	Standard Error	z	Prob. |z|>Z*	95% Confidence Interval
PEST_M	.40763***	.07705	5.29	.0000	.25662 .55865
ANIMAL_W	.87041***	.08767	9.93	.0000	.69859 1.04223
SOIL_C	.27572***	.07683	3.59	.0003	.12514 .42630
BUFFERS	.00444	.00745	.60	.5509	-.01016 .01904
HABITAT_	.21021**	.08899	2.36	.0182	.03580 .38462
COST	-.01187***	.00185	-6.41	.0000	-.01550 -.00825
SQASC	-.37800**	.15963	-2.37	.0179	-.69086 -.06514

***, **, * ==> Significance at 1%, 5%, 10% level.

Figure 4. Results from CLOGIT model that only considered online surveyors. Note, the SQASC was created as an interaction variable between the online variable and the status quo to determine if online surveyors chose to opt out more than in person surveyors.

OPTION	Coefficient	Standard Error	z	Prob. |z|>Z*	95% Confidence Interval
PEST_M	.63110***	.10506	6.01	.0000	.42520 .83701
ANIMAL_W	1.54435***	.12162	12.70	.0000	1.30597 1.78273
SOIL_C	.17375*	.10530	1.65	.0989	-.03264 .38013
BUFFERS	.03327***	.01031	3.23	.0013	.01306 .05348
HABITAT_	.19302	.12460	1.55	.1213	-.05119 .43723
COST	-.01472***	.00254	-5.80	.0000	-.01970 -.00975
SQASC	.13347	.21693	.62	.5384	-.29170 .55865

***, **, * ==> Significance at 1%, 5%, 10% level.

Figure 5. Results from the CLOGIT model that only considers in person surveyors found at farmers markets in the upstate area. In person surveyors appear to care more about buffers than online surveyors, while online surveyors are more mindful of soil conservation and habitat quality than in person surveyors.

Moving Forward

- This project has been developing through the past two years, and due to the recent completion of data collection, further data processing and cleaning will be done to run more tests on this dataset.
- Running more analyses to better compare the two focus groups (online vs. in person) and to further distinguish in person surveyors by farmers market to identify consumer preferences between groups.
- Share results with our farmer partners who will utilize this project to learn more about their consumers selections and how that will impact the practices implemented on their farms.

Acknowledgements

- USDA SARE (Sustainable Agriculture Research and Education) program for admitting this research a grant that has made this project possible.
- Dr. Karen Allen, Dr. Courtney Quinn, and Dr. John Quinn
- The CHESS lab