

# Bt Maize Case Study

## Philippines

### CONTEXT

In March 2006, the Philippines issued Executive Order (EO) No. 514 establishing the National Biosafety Framework, prescribing guidelines for its implementation, strengthening the National Committee on Biosafety of the Philippines (NCBP) and for other purposes. Section 5.4 of EO 514 specifically mandates the NCBP to 'issue guidelines consistent with internationally accepted standards relating to the conduct of social, economic, ethical, cultural and other assessments, as appropriate, prior to decisions to commercialize products of modern biotechnology'.



The case study was envisioned to (1) develop a "best practices" methodology that will generate useful information about the social and economic impacts of BT corn on small-scale farmers; and, (2) pilot the methodology and draw policy implications for local and national decision-makers. In particular, the case study will provide inputs to the NCBP which has been tasked to develop guidelines that address socio-economic consideration for decision-making.

### STUDY AREAS



The Philippines is considered a megacountry, having grown more than 50,000 hectares of biotech crops. As of 2007, about .3 million hectares of agricultural land have been planted to Bt corn (ISAAA Brief 37-2007). There have also been increases in areas devoted to corn with herbicide tolerant (HT) and Insect Resistant (IR) traits, from 11,000 hectares in 2004 to 67,000 hectares in 2007.

The study was conducted within the Province of Isabela

in Northern Luzon and the Province of South Cotabato in Mindanao, Philippines from January 2007 to April 2008. The study sites were chosen based on the high adoption rate of BT corn in these areas.

Sixteen villages were then selected from these two provinces with a total of 468 Bt and non-Bt corn producers chosen randomly. These producers were interviewed face to face using pre-tested questionnaires and visual aids. Several focus group discussions were also undertaken to elicit answers to key questions, draw qualitative information on social and economic dimensions, and to also serve as an input to the broad survey.

#### SOCIAL RESEARCH QUESTION:

Is the quality of life of Bt corn farmers significantly different from that of non-bt corn farmers?

#### TOOLS OF ANALYSIS

The tools of analysis used for the social assessment in this particular study was guided by the need, articulated in a meeting of the research team with the National Committee on Biosafety in the Philippines, to see whether the use of Bt corn impacts on the quality of life of small-scale farmers using Millennium Development Indicators. Moreover, there was an agreement among the members of the research team in the Philippines that we are limit our analysis to the Bt and Non-Bt (limited to hybrid corn users) alone as well as agree on a limited set of variables for this case study.

Given these inputs, the researcher used a **Social Development Monitoring Tool** developed by organizations such as Education Watch and the Community-based Monitoring System network to develop a tool for the study.

However, given that there is an absence of a baseline data by which an ex post assessment can be made, the researchers could at best examine the quality of life of small-scale farmers using bt and non-bt corn farmers and compare the difference between means of their responses.

The social unit of analysis used was the farmer's household. While the social variables examined included the following:

- Livelihoods
- Access to financial assistance from OFWs
- Education level

- Access to education of family members
- Causes of mortality and morbidity
- Access to potable water, sanitation facilities, communication facilities, and other household amenities
- Housing materials
- Food security and diversity
- Perception on the quality of life
- Gender distribution of labor in corn farming
- Power and Control in the Sub-Sectors of Corn Production

NOTE: The focus group discussion also examined how the use of Bt corn have affected the

- knowledge-building process,
- intergenerational transfer of knowledge,
- farming skills and
- capacity of farmers to choose.

#### SAMPLING DESIGN

The sampling design consists of 3 stages:

- Selection of 2 major corn producing provinces
- Selection of 4 major Bt corn producing towns that also had hybrid and open-pollinated varieties corn farmers
- Random selection of small-scale farmers ( Isabela-farmers with 1-3 hectares of land planted to corn; South Cotabato 1-5 hectares of land planted to corn)

TOTAL NUMBER OF RESPONDENTS: 466

#### TOOLS of ANALYSIS:

- Social Development Monitoring Tool
- Focused group discussion guide for:
- Most Significant Change Analysis
- Benefits analysis

#### METHOD OF DATA GATHERING:

- Survey
- Focused group discussion
- Key informant interview

## SCOPE AND LIMITATION OF THE STUDY

The final output of the study only contains the quantitative analysis from the Bt corn and hybrid corn users and excludes those who use open-pollinated varieties. Because the study was only conducted for one season, the final analysis is only limited to determining the significant difference between the quality of life of Bt corn and non-bt corn users.

## FINDINGS and ANALYSIS OF THE STUDY

### Profile of Respondents

Generally, the respondents, whether Bt or non-Bt Corn producer, did differ greatly in terms of their socio-economic profile except on several aspects of education and current livelihood activities.

Both Bt and non-Bt corn farmers had access to education although not everyone were fortunate enough to proceed to higher levels of formal mentoring. More often, households Bt corn users were able to have better access to higher levels of education, had the opportunity of attending private school, and had more access to schools that were nearer to their place of abode. However, in cases where education had to be curtailed, high cost of education and farming-related activities were the more obvious reasons for Bt corn users. On the other hand, non-Bt corn users responded that housekeeping was a more pressing reason why their education was not pursued.

Table 1. Significant Differences in the Profile of Respondents

Unit of Analysis	Chi-square Value	Analysis
Educational attainment	0.21	**
Type of school	0.216	
Literacy	0.246	

Accessibility of school	0.521	**
Location of school	.038	*
Type of school	.013	**
Reasons for not attending school		
High cost of education	.022	*
Farming	.001	**
Housekeeping	.001	**

#### Development Indicators

In terms of economic activity, as would be expected, the respondents are primarily farmers although they would differ in their farming roles. There were more tenants from the set of non-Bt respondents and there were more farmhand/laborers among the Bt farmers.

There were also more non-Bt farmers who had diverse livelihoods, other than farming, as compared to Bt corn farmers. However, there were more Bt corn farmers who diversified in terms of the crops they planted, particularly rice.

Table 2. Significant Differences in the Economic Activities of the Respondents

Unit of Analysis	Chi-square Value	Analysis
Type of Farming Role		
Tenant	.016	*
Farmhand/laborer	.001	
Other forms of livelihoods	.004	
Other crops (rice)	.004	**

In the Philippines, possession of equipment is normally seen as an indicator of progress in farming communities. As the table below would show, there is no significant difference in the equipment possessions of Bt and non-bt corn farmers. There are less of both groups who have access to the equipments mentioned in the table ---- which gives a picture of the general state of the pace of development in the lives of many of these farmers.

Table 3. Indicators of Progress: Equipments

Unit of Analysis	Chi- Square Value	Analysis
electricity	.209	
radio	.494	
tv	.592	
telephone	.150	
Cellular phone	.751	
Washing machine	.406	
refrigerator	.372	
DVD	.820	
karoake	.482	
computer	.225	
tractor	.213	
car	.112	
tricycle	.300	
bicycle	.311	
tiller	.185	
truck	.953	
Farm implements	.223	

If progress was, however, measured in terms of other indicators, i.e. housing tenure

and facilities, this would paint a different picture of the social and economic status of Bt and non-Bt corn farmers. Both Bt and non-Bt corn farmers own the lot or have a secure tenure in areas where their houses are located. However, while many of them have houses made of permanent materials, there is a significant difference in the number of houses made from a mixture of but predominantly light materials ---- and more of these are owned by Bt corn farmers.

Most of the Bt and non-Bt corn farmers do not perceive themselves as poor despite the general perception by others that they are less privileged. They, however, do not seem to perceive that there have been any significant change in their lives, be it economic or in terms of general well-being from its state since the past year. Furthermore, the both Bt and non-bt corn farmers say that their families have enough food to eat but their food generally lacks diversity.

Table 4. Other indicators of household development and perceived quality of life

Unit of Analysis	Chi- Square Value	Analysis
Housing materials		
Walls	.028	*
Roof	.006	*
Perceived poverty status	.785	
State of household well-being	.226	
General economic condition	.809	
Household food status	.486	

## Gender Relations

For purposes of taking the social analysis further, the study ventured in gender analysis. The analysis shows, the for most of the corn-farming activities male have the control, women take on some of the responsibility of ensuring that the work is completed and in some cases, women get paid for the work they do. Generally, however, corn farming is male-dominated in the Philippines. Please refer to the tables 5.1-3 in the appendices for the test of means.

Table 5. Gender Analysis of Corn Production

STAGE	CONTROL		RESPONSIBILITY		Paid LABOR	
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
Farm Planning	70.8	29.2	32.4	67.6	0.6	99.4
Capital acquisition	66.1	33.9	27.3	72.7	0.0	100.0
Farm budgeting	54.3	45.7	24.9	75.1	0.4	99.6
Soil analysis	15.5	84.6	5.2	94.8	0.4	99.6
Climate analysis	32.0	68.0	20.8	79.2	0.6	99.4
Seed selection	83.3	16.7	54.9	45.1	1.1	98.9
Seed preparation	86.9	13.1	56.0	44.0	1.9	98.1
Land preparation	90.6	9.4	57.5	42.5	51.9	48.1
Land cleaning	88.6	11.4	56.0	44.0	52.6	47.4
Land tilling	84.8	15.2	52.1	47.9	53.0	47.0
Irrigating the land	53.0	47.0	33.0	67.0	33.5	66.5
Planting	61.2	38.8	32.0	68.0	29.4	70.6
Weeding	66.1	33.9	33.9	66.1	28.8	71.2
Pruning	12.7	87.3	1.7	98.3	0.4	99.6
Harvesting	62.2	37.8	32.0	68.0	29.8	70.2
Waste management	75.1	24.9	34.1	65.9	6.9	93.1
Collection	71.2	28.8	31.5	68.5	13.3	86.7
Bagging	76.6	23.4	49.4	50.6	32.2	67.8
Loading	81.8	18.2	50.6	49.4	54.7	45.3
Transporting	89.3	10.7	48.7	51.3	54.5	45.5
Marketing	73.4	26.6	37.1	62.9	7.9	92.1
Credit management	66.3	33.7	31.1	68.9	3.4	96.6

This phenomenon seems to be generally true for Bt and non-Bt corn respondents. However, there are areas of farm work where farming patterns between Bt and non-Bt corn farmers in terms of gender relations are significantly different. Gender relations, in this study, have been examined in four (4) areas : control, responsibility, paid and unpaid labor. In examining gender relations (please refer to Tables 5.4-5.11



in the Appendices), it appears that more males among non-Bt corn farmers have more control of the farm budgeting, planting, harvesting, collection, marketing and credit management. Whereas, there are more women, among Bt corn farmers, who take control in collection and marketing processes compared to their non-Bt corn farming counterparts.

There is also more responsibility sharing between women and men among non-Bt farmers in the following areas of work: farm planning, capital acquisition, budgeting, planting, harvesting, waste management, collection, marketing and credit management. Non-Bt corn farmers also engage more males to provide paid labor for planting and harvesting as compared to Bt-corn farmers.

### Sub-Sector Power and Control Analysis

The social analysis for this study also attempted to examine power and control in various sub sectors in corn farming namely:

Subsector 1	Seed production
Subsector 2	Corn production
Subsector 3	Corn production financing
Subsector 4	Land preparation servicing
Subsector 5	Inputs distributing
Subsector 6	Inputs supplying
Subsector 7	Field transporting
Subsector 8	Post-harvest facilities shelling
Subsector 9	Delivery trucking
Subsector 10	Brgy aggregate trading
Subsector 11	Municipal aggregate trading
Subsector 12	Provincial and district trading

The study specifically looked into the role of various stakeholders like the following in each phase of the corn farming sub-sectors:

- 1 small scale farmer (landowner)
- 2 small scale farmer (grower)
- 3 small scale farmer (tenant)
- 4 large scale farmer (landowner)

- 5 LGU agricultural office
- 6 brgy/municipal aggregator/trader
- 7 provincial/district aggregator/trader
- 8 Rural bank
- 9 Other financing institutions (e.g. Quedan)
- 10 Cooperatives
- 11 Seeds/chemicals/fertilizer company
- 12 Grains corporation
- 13 corn millers
- 14 Feed millers
- 15 Agricultural –inputs distributors
- 16 shellers
- 17 truckers
- 18 people's organization
- 19 NGO
- 20 church-based organization
- 21 family-member providing capital
- 21 relative or friend providing capital

The analysis showed the overwhelming role of several actors in most to the sub-sectors for both Bt and non-Bt corn users. For instance, the farmer, seeds/chemicals/fertilizer companies, barangay and municipal aggregators have more prominent roles during seed production and corn production. This means that they are prominent in terms of having control in terms of provision of capital, financial and other related resources, farm technology, and decision making. Surprisingly, the agricultural office of the government seems to have very little influence on the said processes.

Where the intervention of seed companies declined, the role of cooperatives, aggregators/traders at the barangay and municipal levels, along with grains corporations, millers agricultural distributors even truckers seems to become more pronounced. While many of the farmers perceive that they do take a major role in each phase of the sub-sector, the output of the study shows that neither Bt nor non-Bt corn farmers have full control of the production and trading process in corn farming.

## General Findings and Analysis

The study shows does not show an overwhelming difference between Bt and non-Bt corn holders in terms of their quality of life except in several aspects like access to

higher education, access to water, structure of the houses. However, there seem to be an indication that there is more responsibility sharing between women and men among non-Bt corn farmers. And whether corn farmers are using Bt or non-Bt corn, they no longer have full control of the production and trading processes of their corn.

These findings will lead us to conclude that in general, there are no significant or overwhelming differences (except on the social indicators earlier mentioned) in the quality of life of Bt and non-Bt corn farmers in the Philippines. The researcher would like to argue, that this may be explained by the fact that the mode of farming, the demand of farming among those who plant Bt and hybrid corn may not be significantly different. The cost of production and/or the planting patterns may not be that significantly different as compared to those small-scale farmers who plant open-pollinated corn varieties --- who, by the decision of the research team, were not included in target sample for the survey.

#### LESSONS in the ANALYSES OF SOCIAL IMPACTS AT THIS STAGE OF THE RESEARCH:

Examining social variables that are elements of quality of life indicators are possible in a quantitative research approach to determine social impacts on small scale farmers. The social analysis, while being able to capture a broad range of social concerns required to determine social development indicators, is limited by the fact that there is an absence of a comprehensive data base of social indicators, in the target research areas, against which the current social assessment can be compared. Social impacts can at best be gleaned from comparison of the quality of life of Bt and non-Bt corn farmer at certain periods.

The use of qualitative tools of analyses proved to be most useful in understanding with depth the social transformations being undergone by small scale farmers as the use of Bt corn is being pursued. However, differences may be clearly examined if the comparison group could have been small-scale farmers who use open-pollinated varieties of corn and who are cannot afford to use Bt or non-Bt corn.

## APPENDICES

Appendix Table 5.1 One-Sample Test for "Control"

CONTROL	Test Value = .5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Farm Planning	9.874	465	.000	.2082	.1667	.2496
Capital acquisition	7.331	465	.000	.1609	.1178	.2041
Farm budgeting	1.858	465	.064	.0429	-.0025	.0883
Soil analysis	-20.613	465	.000	-.3455	-.3784	-.3126
Climate analysis	-8.335	465	.000	-.1803	-.2228	-.1378
Seed selection	19.213	465	.000	.3326	.2986	.3666
Seed preparation	23.597	465	.000	.3691	.3384	.3998
Land preparation	29.909	465	.000	.4056	.3789	.4322
Land cleaning	26.235	465	.000	.3863	.3573	.4152
Land tilling	20.860	465	.000	.3476	.3149	.3804
Irrigating the land	1.298	465	.195	.0300	-.0154	.0755
Planting	4.937	465	.000	.1116	.0672	.1560
Weeding	7.331	465	.000	.1609	.1178	.2041
Pruning	-24.213	465	.000	-.3734	-.4037	-.3431
Harvesting	5.441	465	.000	.1223	.0781	.1665
Waste management	12.521	465	.000	.2511	.2117	.2905
Collection	10.121	465	.000	.2124	.1712	.2537
Bagging	13.555	465	.000	.2661	.2275	.3047
Loading	17.734	465	.000	.3176	.2824	.3528
Transporting	27.362	465	.000	.3927	.3645	.4209
Marketing	11.414	465	.000	.2339	.1936	.2742
Credit management	7.441	465	.000	.1631	.1200	.2062

Appendix Table 5.2 One-Sample Test for “Responsibility”

	Test Value = .5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Farm Planning	-8.108	465	.000	-.1760	-.2186	-.1333
Capital acquisition	-11.016	465	.000	-.2275	-.2680	-.1869
Farm budgeting	-12.521	465	.000	-.2511	-.2905	-.2117
Soil analysis	-43.758	465	.000	-.4485	-.4686	-.4284
Climate analysis	-15.501	465	.000	-.2918	-.3288	-.2548
Seed selection	2.139	465	.033	.0494	.0040	.0947
Seed preparation	2.610	465	.009	.0601	.0149	.1053
Land preparation	3.276	465	.001	.0751	.0301	.1202
Land cleaning	2.610	465	.009	.0601	.0149	.1053
Land tilling	.926	465	.355	.0215	-.0241	.0670
Irrigating the land	-7.772	465	.000	-.1695	-.2124	-.1267
Planting	-8.335	465	.000	-.1803	-.2228	-.1378
Weeding	-7.331	465	.000	-.1609	-.2041	-.1178
Pruning	-80.155	465	.000	-.4828	-.4947	-.4710
Harvesting	-8.335	465	.000	-.1803	-.2228	-.1378
Waste management	-7.223	465	.000	-.1588	-.2020	-.1156
Collection	-8.564	465	.000	-.1845	-.2269	-.1422
Bagging	-.278	465	.781	-.0064	-.0520	.0391
Loading	.278	465	.781	.0064	-.0391	.0520
Transporting	-.555	465	.579	-.0129	-.0584	.0327
Marketing	-5.747	465	.000	-.1288	-.1728	-.0847
Credit management	-8.796	465	.000	-.1888	-.2310	-.1467

Appendix Table 5.3 One-Sample Test for “Paid Labor”

	Test Value = .5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Farm Planning	-133.077	465	.000	-.4936	-.5009	-.4863
Capital acquisition	-163.518	465	.000	-.4957	-.5017	-.4898
Farm budgeting	-163.518	465	.000	-.4957	-.5017	-.4898
Soil analysis	-133.077	465	.000	-.4936	-.5009	-.4863
Climate analysis	-102.406	465	.000	-.4893	-.4987	-.4799
Seed selection	-75.317	465	.000	-.4807	-.4932	-.4681
Seed preparation	.834	465	.405	.0193	-.0262	.0648
Land preparation	1.112	465	.267	.0258	-.0198	.0713
Land cleaning	1.298	465	.195	.0300	-.0154	.0755
Land tilling	-7.550	465	.000	-.1652	-.2082	-.1222
Irrigating the land	-9.751	465	.000	-.2060	-.2475	-.1645
Planting	-10.121	465	.000	-.2124	-.2537	-.1712
Weeding	-163.518	465	.000	-.4957	-.5017	-.4898
Pruning	-9.508	465	.000	-.2017	-.2434	-.1600
Harvesting	-36.779	465	.000	-.4313	-.4544	-.4083
Waste management	-23.299	465	.000	-.3670	-.3979	-.3360
Collection	-8.221	465	.000	-.1781	-.2207	-.1355
Bagging	2.045	465	.041	.0472	.0018	.0926
Loading	1.951	465	.052	.0451	-.0003	.0904
Transporting	-33.547	465	.000	-.4206	-.4452	-.3960
Marketing	-55.147	465	.000	-.4657	-.4823	-.4491

**Table 5.4. Control**

		Type of corn farmer			
		Bt		NonBt	
		Count	Layer Column %	Count	Layer Column %
Farm Planning	Male	171	68.7%	159	75.0%
	Female	12	4.8%	6	2.8%
	Both	66	26.5%	47	22.2%
Capital acquisition	Male	159	65.4%	149	71.3%
	Female	32	13.2%	16	7.7%
	Both	52	21.4%	44	21.1%
Farm budgeting	Male	122	49.4%	131	61.8%
	Female	60	24.3%	29	13.7%
	Both	65	26.3%	52	24.5%
Soil analysis	Male	41	91.1%	31	93.9%
	Female	0	.0%	0	.0%
	Both	4	8.9%	2	6.1%
Climate analysis	Male	83	74.1%	66	83.5%
	Female	8	7.1%	3	3.8%
	Both	21	18.8%	10	12.7%
Seed selection	Male	204	84.0%	184	87.6%
	Female	17	7.0%	6	2.9%
	Both	22	9.1%	20	9.5%
Seed preparation	Male	215	87.8%	190	91.3%
	Female	12	4.9%	6	2.9%
	Both	18	7.3%	12	5.8%
Land preparation	Male	226	91.9%	196	93.3%
	Female	8	3.3%	5	2.4%
	Both	12	4.9%	9	4.3%
Land cleaning	Male	217	89.3%	196	93.8%
	Female	8	3.3%	5	2.4%
	Both	18	7.4%	8	3.8%
Land tilling	Male	210	92.1%	185	93.4%
	Female	7	3.1%	5	2.5%
	Both	11	4.8%	8	4.0%
Irrigating the land	Male	119	94.4%	128	95.5%
	Female	2	1.6%	2	1.5%
	Both	5	4.0%	4	3.0%



Planting	Male	139	56.0%	146	69.9%
	Female	22	8.9%	11	5.3%
	Both	87	35.1%	52	24.9%
Weeding	Male	152	68.5%	156	78.0%
	Female	27	12.2%	17	8.5%
	Both	43	19.4%	27	13.5%
Pruning	Male	29	61.7%	30	76.9%
	Female	5	10.6%	2	5.1%
	Both	13	27.7%	7	17.9%
Harvesting	Male	142	58.0%	148	70.8%
	Female	20	8.2%	10	4.8%
	Both	83	33.9%	51	24.4%
Waste management	Male	184	77.6%	166	83.4%
	Female	12	5.1%	9	4.5%
	Both	41	17.3%	24	12.1%
Collection	Male	165	74.7%	167	85.6%
	Female	27	12.2%	16	8.2%
	Both	29	13.1%	12	6.2%
Bagging	Male	183	82.8%	174	89.7%
	Female	14	6.3%	8	4.1%
	Both	24	10.9%	12	6.2%
Loading	Male	199	86.1%	182	90.5%
	Female	14	6.1%	8	4.0%
	Both	18	7.8%	11	5.5%
Transporting	Male	201	86.6%	188	92.2%
	Female	13	5.6%	7	3.4%
	Both	18	7.8%	9	4.4%
Marketing	Male	172	71.1%	170	81.7%
	Female	25	10.3%	11	5.3%
	Both	45	18.6%	27	13.0%
Credit management	Male	152	61.8%	157	76.2%
	Female	48	19.5%	18	8.7%
	Both	46	18.7%	31	15.0%

**Table 5.5 Pearson Chi-Square Tests for “Control”**

		Type of corn farmer
Farm Planning	Chi-square	2.679
	df	2
	Sig.	.262
Capital acquisition	Chi-square	3.789
	df	2
	Sig.	.150
Farm budgeting	Chi-square	9.951
	df	2
	Sig.	.007(*)
Soil analysis	Chi-square	.214
	df	1
	Sig.	.643(a)
Climate analysis	Chi-square	2.488
	df	2
	Sig.	.288
Seed selection	Chi-square	4.004
	df	2
	Sig.	.135
Seed preparation	Chi-square	1.733
	df	2
	Sig.	.420
Land preparation	Chi-square	.414
	df	2
	Sig.	.813
Land cleaning	Chi-square	3.066
	df	2
	Sig.	.216
Land tilling	Chi-square	.278
	df	2
	Sig.	.870
Irrigating the land	Chi-square	.193
	df	2
	Sig.	.908(a)
Planting	Chi-square	9.392
	df	2
	Sig.	.009(*)

Weeding	Chi-square	4.848
	df	2
	Sig.	.089
Pruning	Chi-square	2.379
	df	2
	Sig.	.304(a)
Harvesting	Chi-square	8.297
	df	2
	Sig.	.016(*)
Waste management	Chi-square	2.508
	df	2
	Sig.	.285
Collection	Chi-square	8.282
	df	2
	Sig.	.016(*)
Bagging	Chi-square	4.124
	df	2
	Sig.	.127
Loading	Chi-square	2.011
	df	2
	Sig.	.366
Transporting	Chi-square	3.451
	df	2
	Sig.	.178
Marketing	Chi-square	7.430
	df	2
	Sig.	.024(*)
Credit management	Chi-square	13.203
	df	2
	Sig.	.001(*)

Results are based on nonempty rows and columns in each innermost subtable.

\* The Chi-square statistic is significant at the 0.05 level.

a More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.

**Table 5.6. Responsibility**

		Type of corn farmer			
		Bt		NonBt	
		Count	Layer Column %	Count	Layer Column %
Farm Planning	Male	86	50.3%	65	38.9%
	Female	25	14.6%	10	6.0%
	Both	60	35.1%	92	55.1%
Capital acquisition	Male	76	46.9%	51	31.9%
	Female	27	16.7%	16	10.0%
	Both	59	36.4%	93	58.1%
Farm budgeting	Male	65	38.7%	51	30.7%
	Female	51	30.4%	31	18.7%
	Both	52	31.0%	84	50.6%
Soil analysis	Male	15	93.8%	9	81.8%
	Female	0	.0%	0	.0%
	Both	1	6.3%	2	18.2%
Climate analysis	Male	54	70.1%	43	79.6%
	Female	11	14.3%	3	5.6%
	Both	12	15.6%	8	14.8%
Seed selection	Male	127	86.4%	129	87.2%
	Female	8	5.4%	8	5.4%
	Both	12	8.2%	11	7.4%
Seed preparation	Male	131	87.9%	130	91.5%
	Female	8	5.4%	4	2.8%
	Both	10	6.7%	8	5.6%
Land preparation	Male	137	91.3%	131	91.6%
	Female	7	4.7%	6	4.2%
	Both	6	4.0%	6	4.2%
Land cleaning	Male	134	88.2%	127	91.4%
	Female	9	5.9%	5	3.6%
	Both	9	5.9%	7	5.0%
Land tilling	Male	126	89.4%	117	90.7%
	Female	12	8.5%	4	3.1%
	Both	3	2.1%	8	6.2%
Irrigating the land	Male	75	97.4%	79	94.0%
	Female	0	.0%	2	2.4%
	Both	2	2.6%	3	3.6%

Planting	Male	84	51.5%	65	43.9%
	Female	31	19.0%	16	10.8%
	Both	48	29.4%	67	45.3%
Weeding	Male	89	58.6%	69	49.3%
	Female	20	13.2%	8	5.7%
	Both	43	28.3%	63	45.0%
Pruning	Male	2	13.3%	6	60.0%
	Female	4	26.7%	0	.0%
	Both	9	60.0%	4	40.0%
Harvesting	Male	85	52.8%	64	44.1%
	Female	26	16.1%	13	9.0%
	Both	50	31.1%	68	46.9%
Waste management	Male	92	62.6%	67	50.0%
	Female	14	9.5%	8	6.0%
	Both	41	27.9%	59	44.0%
Collection	Male	85	59.4%	62	46.6%
	Female	30	21.0%	19	14.3%
	Both	28	19.6%	52	39.1%
Bagging	Male	117	81.8%	113	88.3%
	Female	13	9.1%	7	5.5%
	Both	13	9.1%	8	6.3%
Loading	Male	117	83.6%	119	90.2%
	Female	13	9.3%	8	6.1%
	Both	10	7.1%	5	3.8%
Transporting	Male	111	86.0%	116	90.6%
	Female	10	7.8%	5	3.9%
	Both	8	6.2%	7	5.5%
Marketing	Male	92	62.6%	81	53.6%
	Female	19	12.9%	8	5.3%
	Both	36	24.5%	62	41.1%
Credit management	Male	74	49.0%	71	45.8%
	Female	32	21.2%	17	11.0%
	Both	45	29.8%	67	43.2%

**Table 5.7 Pearson Chi-Square Tests for “Responsibility”**

		Type of corn farmer
Farm Planning	Chi-square	16.041
	df	2
	Sig.	.000(*)
Capital acquisition	Chi-square	15.329
	df	2
	Sig.	.000(*)
Farm budgeting	Chi-square	14.086
	df	2
	Sig.	.001(*)
Soil analysis	Chi-square	.940
	df	1
	Sig.	.332(a)
Climate analysis	Chi-square	2.663
	df	2
	Sig.	.264
Seed selection	Chi-square	.056
	df	2
	Sig.	.973
Seed preparation	Chi-square	1.392
	df	2
	Sig.	.499
Land preparation	Chi-square	.044
	df	2
	Sig.	.978
Land cleaning	Chi-square	1.002
	df	2
	Sig.	.606
Land tilling	Chi-square	6.085
	df	2
	Sig.	.048(*)
Irrigating the land	Chi-square	2.003
	df	2
	Sig.	.367(a,b)
Planting	Chi-square	9.648
	df	2
	Sig.	.008(*)

Weeding	Chi-square	10.973
	df	2
	Sig.	.004(*)
Pruning	Chi-square	7.212
	df	2
	Sig.	.027(*,a)
Harvesting	Chi-square	9.227
	df	2
	Sig.	.010(*)
Waste management	Chi-square	8.223
	df	2
	Sig.	.016(*)
Collection	Chi-square	12.923
	df	2
	Sig.	.002(*)
Bagging	Chi-square	2.237
	df	2
	Sig.	.327
Loading	Chi-square	2.641
	df	2
	Sig.	.267
Transporting	Chi-square	1.840
	df	2
	Sig.	.399
Marketing	Chi-square	12.027
	df	2
	Sig.	.002(*)
Credit management	Chi-square	8.925
	df	2
	Sig.	.012(*)

Results are based on nonempty rows and columns in each innermost subtable.

\* The Chi-square statistic is significant at the 0.05 level.

a More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.

b The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

**Table 5.8. Paid Labor**

		Type of corn farmer			
		Bt		NonBt	
		Count	Layer Column %	Count	Layer Column %
Farm Planning	None	251	99.2%	211	99.1%
Capital acquisition	Male	1	.4%	2	.9%
	Female	1	.4%	0	.0%
	Both	0	.0%	0	.0%
	None	249	98.4%	211	99.1%
Farm budgeting	Male	0	.0%	0	.0%
	Female	3	1.2%	2	.9%
	Both	1	.4%	0	.0%
	None	249	98.4%	211	99.1%
Soil analysis	Male	1	.4%	1	.5%
	Female	3	1.2%	1	.5%
	Both	0	.0%	0	.0%
Climate analysis	None	252	99.6%	212	99.5%
	Male	1	.4%	1	.5%
Seed selection	Female	0	.0%	0	.0%
	Both	0	.0%	0	.0%
	None	252	99.6%	210	98.6%
Seed preparation	Male	0	.0%	3	1.4%
	Female	0	.0%	0	.0%
	Both	1	.4%	0	.0%
Land preparation	None	252	99.6%	208	97.7%
	Male	0	.0%	5	2.3%
	Female	1	.4%	0	.0%
	Both	0	.0%	0	.0%
Land cleaning	None	251	99.2%	206	96.7%
Land tilling	Male	2	.8%	7	3.3%
	Female	0	.0%	0	.0%
	Both	0	.0%	0	.0%
Irrigating the land	None	138	54.5%	79	37.1%
	Male	110	43.5%	132	62.0%
	Female	4	1.6%	2	.9%
	Both	1	.4%	0	.0%
	None	135	53.4%	78	36.6%



Planting	Male	112	44.3%	133	62.4%
	Female	4	1.6%	2	.9%
	Both	2	.8%	0	.0%
Weeding	None	132	52.2%	79	37.1%
Pruning	Male	116	45.8%	131	61.5%
	Female	4	1.6%	2	.9%
	Both	1	.4%	1	.5%
Harvesting	None	190	75.1%	120	56.3%
	Male	63	24.9%	93	43.7%
	Female	0	.0%	0	.0%
Waste management	Both	0	.0%	0	.0%
	None	117	46.2%	69	32.4%
	Male	72	28.5%	65	30.5%
Collection	Female	11	4.3%	7	3.3%
	Both	53	20.9%	72	33.8%
	None	120	47.4%	76	35.7%
Bagging	Male	72	28.5%	62	29.1%
	Female	9	3.6%	4	1.9%
	Both	52	20.6%	71	33.3%
Loading	None	250	98.8%	210	98.6%
	Male	0	.0%	2	.9%
	Female	0	.0%	0	.0%
Transporting	Both	3	1.2%	1	.5%
	None	115	45.5%	69	32.4%
	Male	74	29.2%	65	30.5%
Marketing	Female	10	4.0%	3	1.4%
	Both	54	21.3%	76	35.7%
	None	236	93.3%	185	86.9%
Credit management	Male	9	3.6%	23	10.8%
	Female	3	1.2%	2	.9%
	Both	5	2.0%	3	1.4%
Farm Planning	None	216	85.4%	177	83.1%
	Male	26	10.3%	36	16.9%
	Female	7	2.8%	0	.0%
Capital acquisition	Both	4	1.6%	0	.0%
	None	119	47.0%	75	35.2%
	Male	82	32.4%	68	31.9%
	Female	6	2.4%	3	1.4%
	Both	46	18.2%	67	31.5%

Farm budgeting	None	122	48.2%	78	36.6%
	Male	123	48.6%	132	62.0%
Soil analysis	Female	5	2.0%	2	.9%
	Both	3	1.2%	1	.5%
Climate analysis	None	125	49.4%	76	35.7%
	Male	121	47.8%	133	62.4%
	Female	5	2.0%	3	1.4%
	Both	2	.8%	1	.5%
Seed selection	None	230	90.9%	194	91.1%
	Male	19	7.5%	18	8.5%
	Female	1	.4%	1	.5%
	Both	3	1.2%	0	.0%
Seed preparation	None	242	95.7%	201	94.4%
	Male	6	2.4%	10	4.7%
	Female	3	1.2%	2	.9%
	Both	2	.8%	0	.0%

**Table 5.9 Pearson Chi-Square Tests for “Paid Labor”**

		Type of corn farmer
Farm Planning	Chi-square	1.373
	df	2
	Sig.	.503(a,b)
Capital acquisition	Chi-square	.912
	df	2
	Sig.	.634(a,b)
Farm budgeting	Chi-square	.711
	df	2
	Sig.	.701(a,b)
Soil analysis	Chi-square	.015
	df	1
	Sig.	.903(a,b)
Climate analysis	Chi-square	4.417
	df	2
	Sig.	.110(a,b)
Seed selection	Chi-square	6.826
	df	2
	Sig.	.033(*,a,b)
Seed preparation	Chi-square	3.803
	df	1
	Sig.	.051(a)
Land preparation	Chi-square	16.395
	df	3
	Sig.	.001(*,a,b)
Land cleaning	Chi-square	16.408
	df	3
	Sig.	.001(*,a,b)
Land tilling	Chi-square	11.542
	df	3
	Sig.	.009(*,a,b)
Irrigating the land	Chi-square	18.277
	df	1
	Sig.	.000(*)
Planting	Chi-square	13.185
	df	3
	Sig.	.004(*)

Weeding	Chi-square	12.138
	df	3
	Sig.	.007(*)
Pruning	Chi-square	3.067
	df	2
	Sig.	.216(a,b)
Harvesting	Chi-square	16.261
	df	3
	Sig.	.001(*)
Waste management	Chi-square	9.641
	df	3
	Sig.	.022(*,a)
Collection	Chi-square	13.147
	df	3
	Sig.	.004(*,a)
Bagging	Chi-square	12.850
	df	3
	Sig.	.005(*,a)
Loading	Chi-square	8.916
	df	3
	Sig.	.030(*,a)
Transporting	Chi-square	9.986
	df	3
	Sig.	.019(*,a)
Marketing	Chi-square	2.670
	df	3
	Sig.	.445(a,b)
Credit management	Chi-square	3.588
	df	3
	Sig.	.310(a,b)

Results are based on nonempty rows and columns in each innermost subtable.

\* The Chi-square statistic is significant at the 0.05 level.

a More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.

b The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

**Table 5. 10. Unpaid Labor**

		Type of corn farmer			
		Bt		NonBt	
		Count	Layer Column %	Count	Layer Column %
Farm Planning	None	92	36.4%	107	50.2%
Capital acquisition	Male	95	37.5%	64	30.0%
	Female	7	2.8%	4	1.9%
	Both	59	23.3%	38	17.8%
Farm budgeting	None	96	37.9%	106	49.8%
	Male	86	34.0%	53	24.9%
	Female	29	11.5%	19	8.9%
	Both	42	16.6%	35	16.4%
Soil analysis	None	97	38.3%	106	49.8%
	Male	49	19.4%	35	16.4%
	Female	53	20.9%	29	13.6%
	Both	54	21.3%	43	20.2%
Climate analysis	None	212	83.8%	182	85.4%
	Male	39	15.4%	29	13.6%
Seed selection	Female	0	.0%	0	.0%
	Both	2	.8%	2	.9%
	None	151	59.7%	145	68.1%
	Male	81	32.0%	57	26.8%
Seed preparation	Female	5	2.0%	3	1.4%
	Both	16	6.3%	8	3.8%
	None	98	38.7%	108	50.7%
Land preparation	Male	129	51.0%	83	39.0%
	Female	13	5.1%	4	1.9%
	Both	13	5.1%	18	8.5%
Land cleaning	None	99	39.1%	111	52.1%
Land tilling	Male	137	54.2%	91	42.7%
	Female	9	3.6%	3	1.4%
	Both	8	3.2%	8	3.8%
	None	115	45.5%	125	58.7%
Irrigating the land	Male	133	52.6%	81	38.0%
	Female	2	.8%	2	.9%
	Both	3	1.2%	5	2.3%
	None	122	48.2%	129	60.6%

Planting	Male	119	47.0%	78	36.6%
	Female	3	1.2%	2	.9%
	Both	9	3.6%	4	1.9%
Weeding	None	127	50.2%	134	62.9%
Pruning	Male	114	45.1%	73	34.3%
	Female	3	1.2%	2	.9%
	Both	9	3.6%	4	1.9%
Harvesting	None	204	80.6%	180	84.5%
	Male	47	18.6%	32	15.0%
	Female	1	.4%	0	.0%
	Both	1	.4%	1	.5%
Waste management	None	119	47.0%	129	60.6%
	Male	47	18.6%	35	16.4%
	Female	18	7.1%	11	5.2%
Collection	Both	69	27.3%	38	17.8%
	None	144	56.9%	139	65.3%
Bagging	Male	55	21.7%	43	20.2%
	Female	25	9.9%	14	6.6%
	Both	29	11.5%	17	8.0%
Loading	None	216	85.4%	185	86.9%
	Male	27	10.7%	22	10.3%
	Female	5	2.0%	1	.5%
	Both	5	2.0%	5	2.3%
Transporting	None	123	48.6%	130	61.0%
	Male	53	20.9%	37	17.4%
	Female	14	5.5%	8	3.8%
Marketing	Both	63	24.9%	38	17.8%
	None	114	45.1%	128	60.1%
Credit management	Male	104	41.1%	64	30.0%
	Female	7	2.8%	6	2.8%
	Both	28	11.1%	15	7.0%
Farm Planning	None	148	58.5%	139	65.3%
	Male	66	26.1%	47	22.1%
	Female	21	8.3%	18	8.5%
	Both	18	7.1%	9	4.2%
Capital acquisition	None	155	61.3%	149	70.0%
	Male	77	30.4%	49	23.0%
	Female	8	3.2%	6	2.8%
	Both	13	5.1%	9	4.2%

Farm budgeting	None	144	56.9%	140	65.7%
Soil analysis	Male	94	37.2%	60	28.2%
	Female	6	2.4%	5	2.3%
	Both	9	3.6%	8	3.8%
	None	143	56.5%	141	66.2%
Climate analysis	Male	95	37.5%	63	29.6%
	Female	6	2.4%	4	1.9%
	Both	9	3.6%	5	2.3%
	None	110	43.5%	118	55.4%
Seed selection	Male	90	35.6%	65	30.5%
	Female	21	8.3%	9	4.2%
	Both	32	12.6%	21	9.9%
Seed preparation	None	100	39.5%	114	53.5%
	Male	71	28.1%	55	25.8%
	Female	46	18.2%	19	8.9%
	Both	36	14.2%	25	11.7%

**Table 5.11. Pearson Chi-Square Tests for “Unpaid Labor”**

		Type of corn farmer
Farm Planning	Chi-square	9.173
	df	3
	Sig.	.027(*)
Capital acquisition	Chi-square	7.672
	df	3
	Sig.	.053
Farm budgeting	Chi-square	7.627
	df	3
	Sig.	.054
Soil analysis	Chi-square	.324
	df	2
	Sig.	.851(a)
Climate analysis	Chi-square	4.059
	df	3
	Sig.	.255(a)
Seed selection	Chi-square	12.698
	df	3
	Sig.	.005(*)
Seed preparation	Chi-square	9.604
	df	3
	Sig.	.022(*)
Land preparation	Chi-square	10.194
	df	3
	Sig.	.017(*,a)
Land cleaning	Chi-square	7.473
	df	3
	Sig.	.058(a)
Land tilling	Chi-square	7.925
	df	3
	Sig.	.048(*,a)



Irrigating the land	Chi-square	1.929
	df	3
	Sig.	.587(a,b)
Planting	Chi-square	9.467
	df	3
	Sig.	.024(*)
Weeding	Chi-square	4.390
	df	3
	Sig.	.222
Pruning	Chi-square	2.156
	df	3
	Sig.	.541(a)
Harvesting	Chi-square	7.484
	df	3
	Sig.	.058
Waste manageme nt	Chi-square	10.988
	df	3
	Sig.	.012(*)
Collection	Chi-square	3.299
	df	3
	Sig.	.348
Bagging	Chi-square	3.949
	df	3
	Sig.	.267
Loading	Chi-square	4.311
	df	3
	Sig.	.230
Transportin g	Chi-square	4.639
	df	3
	Sig.	.200
Marketing	Chi-square	8.022
	df	3
	Sig.	.046(*)
Credit manageme nt	Chi-square	12.808
	df	3

Sig.	.005(*)
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Results are based on nonempty rows and columns in each innermost subtable.

\* The Chi-square statistic is significant at the 0.05 level.

a More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.

b The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

## **POWER AND CONTROL SUBSECTOR ANALYSIS**

**Table 6.1. Seed production**

SEED PRODUCTION*		CORN			
		Bt		NonBt	
		Count	Layer Column %	Count	Layer Column %
CAPITAL.1: Capital provided by	0	91	36.0%	103	48.4%
	1	25	9.9%	19	8.9%
	1, 15, 16, 17	0	.0%	1	.5%
	1, 6	8	3.2%	6	2.8%
	1, 6,	0	.0%	1	.5%
	10	2	.8%	2	.9%
	11	50	19.8%	43	20.2%
	17	0	.0%	1	.5%
	2	3	1.2%	5	2.3%
	21	12	4.7%	4	1.9%
	3	2	.8%	0	.0%
	4	2	.8%	1	.5%
	6	46	18.2%	20	9.4%
	7	12	4.7%	6	2.8%
	9	0	.0%	1	.5%
FINANCES.1: Finances an other resources controlled by	0	92	36.4%	105	49.3%
	1	46	18.2%	21	9.9%
	1, 6	14	5.5%	7	3.3%
	10	2	.8%	2	.9%
	11	47	18.6%	37	17.4%
	15	1	.4%	1	.5%
	17	0	.0%	1	.5%
	2	3	1.2%	5	2.3%
	21	2	.8%	3	1.4%
	3	2	.8%	0	.0%
	4	3	1.2%	3	1.4%
	6	36	14.2%	24	11.3%
	7	4	1.6%	3	1.4%
	9	1	.4%	1	.5%
FARM_TEC.1: Farm technology owned and controlled by	0	82	32.4%	99	46.5%
	1	53	20.9%	26	12.2%
	1, 15	2	.8%	0	.0%
	1, 4	1	.4%	0	.0%

DECISION.1: Decision-making controlled by	1, 5	5	2.0%	3	1.4%
	1, 5, 11	0	.0%	1	.5%
	1, 5, 6	2	.8%	1	.5%
	1, 5, 6, 15	0	.0%	1	.5%
	1, 6	6	2.4%	3	1.4%
	11	67	26.5%	55	25.8%
	11, 16, 17	0	.0%	1	.5%
	12	1	.4%	0	.0%
	15	1	.4%	1	.5%
	2	2	.8%	1	.5%
	4	7	2.8%	3	1.4%
	5	4	1.6%	5	2.3%
	5, 6, 7, 8, 9, 10, 11	1	.4%	0	.0%
	6	18	7.1%	11	5.2%
	7	1	.4%	2	.9%
	0	91	36.0%	104	48.8%
	1	84	33.2%	46	21.6%
	1, 15	1	.4%	0	.0%
	1, 16	0	.0%	1	.5%
	1, 6	8	3.2%	3	1.4%
	1, 6, 15	0	.0%	1	.5%
	10	1	.4%	0	.0%
	11	45	17.8%	39	18.3%
	18	1	.4%	1	.5%
	2	9	3.6%	8	3.8%
	2, 11	0	.0%	1	.5%
	21	0	.0%	3	1.4%
	3	2	.8%	0	.0%
	4	2	.8%	3	1.4%
	4, 9	1	.4%	0	.0%
	6	7	2.8%	2	.9%
	7	1	.4%	1	.5%

**\*NOTES: Please refer to the codes below.**

**Codes:**

1 small scale farmer (landowner)

2 small scale farmer (grower)

- 3 small scale farmer (tenant)
- 4 large scale farmer (landowner)
- 5 LGU agricultural office
- 6 brgy/municipal aggregator/trader
- 7 provincial/district aggregator/trader
- 8 Rural bank
- 9 Other financing institutions (e.g. Quedan)
- 10 Cooperatives
- 11 Seeds/chemicals/fertilizer company
- 12 Grains corporation
- 13 corn millers
- 14 Feed millers
- 15 Agricultural –inputs distributors
- 16 shellers
- 17 truckers
- 18 people's organization
- 19 NGO
- 20 church-based organization
- 21 family-member providing capital
- 21 relative or friend providing capital

**Pearson Chi-Square Tests for “Seed Production”**

		CORN
CAPITAL.1: Capital provided by	Chi-square	22.179
	df	14
	Sig.	.075(a,b)
FINANCES.1: Finances an other resources controlled by	Chi-square	16.642
	df	13
	Sig.	.216(a,b)
FARM_TEC.1: Farm technology owned and controlled by	Chi-square	22.639
	df	18
	Sig.	.205(a,b)
DECISION.1: Decision-making controlled by	Chi-square	25.466
	df	16
	Sig.	.062(a,b)

Results are based on nonempty rows and columns in each innermost subtable.

a More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.

b The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

Table 6. 2. Corn Production

		CORN			
		Bt		NonBt	
		Count	Layer Column %	Count	Layer Column %
CAPITAL.2: Capital provided by	0	1	.4%	2	.9%
	1	62	24.5%	62	29.1%
	1, 15	2	.8%	3	1.4%
	1, 15, 16, 17	0	.0%	1	.5%
	1, 2, 3, 15, 21	0	.0%	1	.5%
	1, 21	0	.0%	5	2.3%
	1, 22	3	1.2%	6	2.8%
	1, 3	3	1.2%	1	.5%
	1, 3, 11, 15, 16, 17	1	.4%	0	.0%
	1, 3, 4	1	.4%	0	.0%
	1, 3, 4, 9	3	1.2%	1	.5%
	1, 3, 4, 9, 21	1	.4%	1	.5%
	1, 3, 9	1	.4%	4	1.9%
	1, 3, 9, 10, 21, 22	2	.8%	0	.0%
	1, 3, 9, 21	1	.4%	1	.5%
	1, 3, 9, 21, 22	1	.4%	1	.5%
	1, 5	0	.0%	1	.5%
	1, 6	11	4.3%	7	3.3%
	1, 6,	0	.0%	1	.5%
	1, 9	9	3.6%	21	9.9%
	1, 9, 10, 11, 12, 15, 16, 17, 21, 22	1	.4%	0	.0%
	1, 9, 10, 11, 15, 16, 17, 21, 22	0	.0%	1	.5%
	1, 9, 10, 11, 15, 21, 22	1	.4%	0	.0%
	1, 9, 10, 15, 16, 17, 21, 22	2	.8%	0	.0%
	1, 9, 10, 21	1	.4%	0	.0%
	1, 9, 10, 21, 22	7	2.8%	3	1.4%
	1, 9, 21	2	.8%	0	.0%
	1, 9, 21, 22	4	1.6%	0	.0%
	1, 9, 22	1	.4%	0	.0%
	10	23	9.1%	16	7.5%
	11	8	3.2%	5	2.3%

	12	1	.4%	0	.0%
	17	0	.0%	1	.5%
	2	7	2.8%	8	3.8%
	2, 21	1	.4%	0	.0%
	2, 9	1	.4%	2	.9%
	2, 9, 10	1	.4%	0	.0%
	2, 9, 10, 21	1	.4%	0	.0%
	2, 9, 10, 21, 22	2	.8%	1	.5%
	2, 9, 10, 22	1	.4%	0	.0%
	2, 9, 21, 22	1	.4%	0	.0%
	21	16	6.3%	5	2.3%
	3	3	1.2%	9	4.2%
	3, 21	0	.0%	1	.5%
	3, 4, 9	2	.8%	0	.0%
	3, 6	1	.4%	0	.0%
	3, 9	0	.0%	7	3.3%
	3, 9, 10	1	.4%	0	.0%
	3, 9, 10, 21	1	.4%	0	.0%
	3, 9, 10, 21, 22	3	1.2%	0	.0%
	3, 9, 21, 22	1	.4%	0	.0%
	4	1	.4%	2	.9%
	6	50	19.8%	30	14.1%
	7	5	2.0%	2	.9%
	9	1	.4%	1	.5%
FINANCES.2:	0	12	4.7%	12	5.6%
Finances an other	1	79	31.2%	72	33.8%
resources controlled by	1, 11, 12, 15, 16, 17	5	2.0%	0	.0%
	1, 11, 12, 15, 16, 17	1	.4%	1	.5%
	1, 11, 12, 15, 16, 17	16	6.3%	3	1.4%
	1, 11, 12, 15, 16, 17, 21	1	.4%	1	.5%
	1, 11, 12, 15, 17	1	.4%	0	.0%
	1, 11, 15, 16, 17	1	.4%	0	.0%
	1, 13, 15, 17	0	.0%	1	.5%
	1, 15	1	.4%	3	1.4%
	1, 15, 16, 17	1	.4%	0	.0%
	1, 21	0	.0%	4	1.9%
	1, 22	2	.8%	6	2.8%
	1, 3	1	.4%	1	.5%
	1, 3, 11, 12, 15, 16, 17	2	.8%	0	.0%



FARM_TEC.2: Farm technology owned and controlled by	1, 3, 11, 12, 15, 16, 17	1	.4%	1	.5%
	1, 6	13	5.1%	5	2.3%
	1, 6, 11, 12, 15, 16, 17	3	1.2%	2	.9%
	1, 6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	1, 9	7	2.8%	20	9.4%
	10	19	7.5%	12	5.6%
	11	7	2.8%	5	2.3%
	12	1	.4%	0	.0%
	17	0	.0%	1	.5%
	2	5	2.0%	7	3.3%
	2, 11, 12, 15, 16, 17	4	1.6%	0	.0%
	2, 11, 12, 15, 16, 17	5	2.0%	2	.9%
	2, 9	1	.4%	2	.9%
	21	3	1.2%	1	.5%
	3	8	3.2%	10	4.7%
	3, 11, 12, 15, 16, 17	4	1.6%	0	.0%
	3, 11, 12, 15, 16, 17	2	.8%	1	.5%
	3, 6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	3, 9	0	.0%	8	3.8%
	4	5	2.0%	2	.9%
	6	37	14.6%	28	13.1%
	7	2	.8%	1	.5%
	9	0	.0%	1	.5%
	9, 15, 21	1	.4%	0	.0%
	0	88	34.8%	101	47.4%
	1	77	30.4%	43	20.2%
	1, 15	2	.8%	0	.0%
	1, 5	3	1.2%	3	1.4%
	1, 5, 6	2	.8%	2	.9%
	1, 5, 6, 15	0	.0%	1	.5%
	1, 6	8	3.2%	3	1.4%
	1, 7	0	.0%	1	.5%
	10	11	4.3%	10	4.7%
	11	13	5.1%	18	8.5%
	11, 12, 13, 15, 16, 17	3	1.2%	1	.5%
	11, 12, 15, 16, 17	1	.4%	0	.0%
	11, 13	0	.0%	1	.5%
	11, 15, 16, 17	1	.4%	0	.0%
	11, 16, 17	0	.0%	1	.5%

	12	0	.0%	1	.5%
	16	1	.4%	0	.0%
	2	3	1.2%	1	.5%
	3	5	2.0%	2	.9%
	4	7	2.8%	1	.5%
	5	7	2.8%	8	3.8%
	5, 6, 7, 8, 9, 10, 11	1	.4%	1	.5%
	6	18	7.1%	13	6.1%
	7	2	.8%	1	.5%
DECISION.2: Decision-	0	0	.0%	2	.9%
making controlled by	1	165	65.2%	133	62.4%
	1, 15	1	.4%	0	.0%
	1, 21	0	.0%	2	.9%
	1, 3	8	3.2%	7	3.3%
	1, 3, 4	5	2.0%	3	1.4%
	1, 6	8	3.2%	5	2.3%
	10	7	2.8%	9	4.2%
	11	7	2.8%	4	1.9%
	18	0	.0%	1	.5%
	2	20	7.9%	16	7.5%
	2, 21	1	.4%	0	.0%
	21	0	.0%	3	1.4%
	3	16	6.3%	18	8.5%
	3, 4	2	.8%	0	.0%
	4	4	1.6%	2	.9%
	5	1	.4%	0	.0%
	6	7	2.8%	7	3.3%
	7	1	.4%	1	.5%

### Pearson Chi-Square Tests for "Corn Production"

		CORN
CAPITAL.2:	Chi-square	77.825
Capital provided by	df	54
	Sig.	.019(*,a,b)
FINANCES.2:	Chi-square	64.563
Finances an other	df	38
resources	Sig.	.005(*,a,b)
controlled by		

FARM_TEC.2:	Chi-square	29.430
Farm technology	df	23
owned and		
controlled by	Sig.	.166(a,b)
DECISION.2:	Chi-square	16.682
Decision-making	df	18
controlled by		
	Sig.	.545(a,b)

Results are based on nonempty rows and columns in each innermost subtable.

\* The Chi-square statistic is significant at the 0.05 level.

a More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.

b The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

**Table 6.3. Corn Production Financing**

		CORN			
		Bt		NonBt	
		Count	Layer Column %	Count	Layer Column %
CAPITAL.3: Capital provided by	0	2	.8%	4	1.9%
	1	51	20.2%	57	26.8%
	1, 15	2	.8%	3	1.4%
	1, 15, 16, 17	0	.0%	1	.5%
	1, 21	0	.0%	5	2.3%
	1, 22	3	1.2%	6	2.8%
	1, 3	3	1.2%	1	.5%
	1, 3, 11, 15, 16, 17	1	.4%	0	.0%
	1, 3, 4	1	.4%	0	.0%
	1, 3, 4, 9	3	1.2%	1	.5%
	1, 3, 4, 9, 21	1	.4%	1	.5%
	1, 3, 9	1	.4%	4	1.9%
	1, 3, 9, 10, 21, 22	2	.8%	0	.0%
	1, 3, 9, 21	1	.4%	1	.5%
	1, 3, 9, 21, 22	1	.4%	1	.5%
	1, 6	18	7.1%	8	3.8%
	1, 9	9	3.6%	21	9.9%
	1, 9, 10, 11, 12, 15, 16, 17, 21, 22	1	.4%	0	.0%
	1, 9, 10, 11, 15, 16, 17, 21, 22	0	.0%	1	.5%
	1, 9, 10, 11, 15, 21, 22	1	.4%	0	.0%
	1, 9, 10, 15, 16, 17, 21, 22	2	.8%	0	.0%
	1, 9, 10, 21	1	.4%	0	.0%
	1, 9, 10, 21, 22	7	2.8%	3	1.4%
	1, 9, 21	2	.8%	0	.0%
	1, 9, 21, 22	4	1.6%	0	.0%
	1, 9, 22	1	.4%	0	.0%
	10	23	9.1%	18	8.5%
	11	3	1.2%	1	.5%
	15	2	.8%	2	.9%
	17	0	.0%	1	.5%
	2	7	2.8%	7	3.3%

	2, 21	1	.4%	0	.0%
	2, 9	1	.4%	2	.9%
	2, 9, 10	1	.4%	0	.0%
	2, 9, 10, 21	1	.4%	0	.0%
	2, 9, 10, 21, 22	2	.8%	1	.5%
	2, 9, 10, 22	1	.4%	0	.0%
	2, 9, 21, 22	1	.4%	0	.0%
	21	17	6.7%	6	2.8%
	3	3	1.2%	9	4.2%
	3, 21	0	.0%	1	.5%
	3, 4, 9	2	.8%	0	.0%
	3, 6	1	.4%	0	.0%
	3, 9	0	.0%	7	3.3%
	3, 9, 10	1	.4%	0	.0%
	3, 9, 10, 21	1	.4%	0	.0%
	3, 9, 10, 21, 22	3	1.2%	0	.0%
	3, 9, 21, 22	1	.4%	0	.0%
	4	3	1.2%	1	.5%
	6	54	21.3%	35	16.4%
	7	6	2.4%	2	.9%
	9	0	.0%	2	.9%
FINANCES.3:	0	11	4.3%	10	4.7%
Finances an other	1	75	29.6%	65	30.5%
resources controlled by	1, 11, 12, 15, 16, 17	5	2.0%	0	.0%
	1, 11, 12, 15, 16, 17	1	.4%	1	.5%
	1, 11, 12, 15, 16, 17	16	6.3%	3	1.4%
	1, 11, 12, 15, 16, 17, 21	1	.4%	1	.5%
	1, 11, 12, 15, 17	1	.4%	0	.0%
	1, 11, 15, 16, 17	1	.4%	0	.0%
	1, 13, 15, 17	0	.0%	1	.5%
	1, 15	1	.4%	3	1.4%
	1, 15, 16, 17	1	.4%	0	.0%
	1, 21	0	.0%	4	1.9%
	1, 22	2	.8%	6	2.8%
	1, 3	1	.4%	1	.5%
	1, 3, 11, 12, 15, 16, 17	2	.8%	0	.0%
	1, 3, 11, 12, 15, 16, 17	1	.4%	1	.5%
	1, 6	14	5.5%	6	2.8%
	1, 6, 11, 12, 15, 16, 17	3	1.2%	2	.9%

FARM_TEC.3: Farm technology owned and controlled by	1, 6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	1, 9	7	2.8%	20	9.4%
	10	21	8.3%	14	6.6%
	11	3	1.2%	1	.5%
	12	0	.0%	1	.5%
	15	1	.4%	1	.5%
	17	0	.0%	1	.5%
	2	4	1.6%	7	3.3%
	2, 11, 12, 15, 16, 17	4	1.6%	0	.0%
	2, 11, 12, 15, 16, 17	5	2.0%	2	.9%
	2, 9	1	.4%	2	.9%
	21	1	.4%	3	1.4%
	3	8	3.2%	10	4.7%
	3, 11, 12, 15, 16, 17	4	1.6%	0	.0%
	3, 11, 12, 15, 16, 17	2	.8%	1	.5%
	3, 6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	3, 9	0	.0%	8	3.8%
	4	5	2.0%	2	.9%
	6	42	16.6%	33	15.5%
	7	3	1.2%	2	.9%
	9	3	1.2%	1	.5%
	9, 15, 21	1	.4%	0	.0%
	0	87	34.4%	101	47.4%
	1	73	28.9%	43	20.2%
	1, 15	1	.4%	0	.0%
	1, 4	1	.4%	0	.0%
	1, 6	12	4.7%	5	2.3%
	1, 8	0	.0%	1	.5%
	10	13	5.1%	13	6.1%
	11	9	3.6%	7	3.3%
	11, 12, 13, 15, 16, 17	3	1.2%	1	.5%
	11, 12, 15, 16, 17	1	.4%	0	.0%
	11, 13	0	.0%	1	.5%
	11, 15, 16, 17	1	.4%	0	.0%
	11, 16, 17	0	.0%	1	.5%
	15	1	.4%	2	.9%
	17	0	.0%	1	.5%
	2	1	.4%	1	.5%
	21	0	.0%	2	.9%

DECISION.3: Decision-making controlled by	3	5	2.0%	2	.9%
	4	4	1.6%	2	.9%
	5	1	.4%	1	.5%
	5, 6, 7, 8, 9, 10, 11	1	.4%	1	.5%
	6	32	12.6%	24	11.3%
	7	5	2.0%	4	1.9%
	8	1	.4%	0	.0%
	9	1	.4%	0	.0%
	0	1	.4%	3	1.4%
	1	152	60.1%	128	60.1%
	1, 21	0	.0%	2	.9%
	1, 3	8	3.2%	6	2.8%
	1, 3, 4	5	2.0%	3	1.4%
	1, 6	11	4.3%	7	3.3%
	10	9	3.6%	11	5.2%
	11	3	1.2%	0	.0%
	16	0	.0%	1	.5%
	17	0	.0%	1	.5%
	2	19	7.5%	12	5.6%
	2, 21	1	.4%	0	.0%
	21	1	.4%	3	1.4%
	3	16	6.3%	18	8.5%
	3, 4	2	.8%	0	.0%
	4	3	1.2%	4	1.9%
	6	21	8.3%	13	6.1%
	7	1	.4%	1	.5%

#### Pearson Chi-Square Tests for “Corn Production Financing”

		CORN
CAPITAL.3: Capital provided by	Chi-square	78.988
	df	51
	Sig.	.007(*,a,b)
FINANCES.3: Finances an other resources controlled by	Chi-square	65.322
	df	39
	Sig.	.005(*,a,b)
FARM_TEC.3: Farm technology owned and	Chi-square	25.226
	df	24

controlled by	Sig.	.394(a,b)
DECISION.3:	Chi-square	16.342
Decision-making	df	17
controlled by	Sig.	.500(a,b)

Results are based on nonempty rows and columns in each innermost subtable.

\* The Chi-square statistic is significant at the 0.05 level.

a More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.

b The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.



**Table 6.4. Land Preparation Servicing**

		CORN			
		Bt		NonBt	
		Count	Layer Column %	Count	Layer Column %
CAPITAL.4: Capital provided by	0	2	.8%	5	2.3%
	1	90	35.6%	74	34.7%
	1, 15	2	.8%	3	1.4%
	1, 15, 16, 17	0	.0%	1	.5%
	1, 21	5	2.0%	5	2.3%
	1, 22	3	1.2%	5	2.3%
	1, 3	3	1.2%	1	.5%
	1, 3, 11, 15, 16, 17	1	.4%	0	.0%
	1, 3, 4	1	.4%	0	.0%
	1, 3, 4, 9	3	1.2%	1	.5%
	1, 3, 4, 9, 21	1	.4%	1	.5%
	1, 3, 9	1	.4%	4	1.9%
	1, 3, 9, 10, 21, 22	2	.8%	0	.0%
	1, 3, 9, 21	1	.4%	1	.5%
	1, 3, 9, 21, 22	1	.4%	1	.5%
	1, 6	6	2.4%	4	1.9%
	1, 9	9	3.6%	21	9.9%
	1, 9, 10, 11, 12, 15, 16, 17, 21, 22	1	.4%	0	.0%
	1, 9, 10, 11, 15, 16, 17, 21, 22	0	.0%	1	.5%
	1, 9, 10, 11, 15, 21, 22	1	.4%	0	.0%
	1, 9, 10, 15, 16, 17, 21, 22	2	.8%	0	.0%
	1, 9, 10, 21	1	.4%	0	.0%
	1, 9, 10, 21, 22	7	2.8%	3	1.4%
	1, 9, 21	2	.8%	0	.0%
	1, 9, 21, 22	4	1.6%	0	.0%
	1, 9, 22	1	.4%	0	.0%
	10	28	11.1%	22	10.3%
	11	0	.0%	1	.5%
	15	6	2.4%	0	.0%
	17	0	.0%	1	.5%

	2	4	1.6%	7	3.3%
	2, 21	1	.4%	0	.0%
	2, 9	1	.4%	2	.9%
	2, 9, 10	1	.4%	0	.0%
	2, 9, 10, 21	1	.4%	0	.0%
	2, 9, 10, 21, 22	2	.8%	1	.5%
	2, 9, 10, 22	1	.4%	0	.0%
	2, 9, 21, 22	1	.4%	0	.0%
	21	11	4.3%	4	1.9%
	3	2	.8%	9	4.2%
	3, 21	0	.0%	1	.5%
	3, 4, 9	2	.8%	0	.0%
	3, 6	1	.4%	0	.0%
	3, 9	0	.0%	7	3.3%
	3, 9, 10	1	.4%	0	.0%
	3, 9, 10, 21	1	.4%	0	.0%
	3, 9, 10, 21, 22	3	1.2%	0	.0%
	3, 9, 21, 22	1	.4%	0	.0%
	4	4	1.6%	2	.9%
	4, 5, 6	1	.4%	0	.0%
	6	30	11.9%	25	11.7%
FINANCES.4:	0	12	4.7%	10	4.7%
Finances an other	1	107	42.3%	81	38.0%
resources controlled by	1, 11, 12, 15, 16, 17	5	2.0%	0	.0%
	1, 11, 12, 15, 16, 17	1	.4%	1	.5%
	1, 11, 12, 15, 16, 17	16	6.3%	3	1.4%
	1, 11, 12, 15, 16, 17, 21	1	.4%	1	.5%
	1, 11, 12, 15, 17	1	.4%	0	.0%
	1, 11, 15, 16, 17	1	.4%	0	.0%
	1, 13, 15, 17	0	.0%	1	.5%
	1, 15	1	.4%	3	1.4%
	1, 15, 16, 17	1	.4%	0	.0%
	1, 21	0	.0%	4	1.9%
	1, 22	2	.8%	5	2.3%
	1, 3	1	.4%	1	.5%
	1, 3, 11, 12, 15, 16, 17	2	.8%	0	.0%
	1, 3, 11, 12, 15, 16, 17	1	.4%	1	.5%
	1, 6	2	.8%	2	.9%
	1, 6, 11, 12, 15, 16, 17	3	1.2%	2	.9%

FARM_TEC.4: Farm technology owned and controlled by	1, 6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	1, 9	7	2.8%	20	9.4%
	10	23	9.1%	18	8.5%
	11	1	.4%	1	.5%
	11, 12, 15	0	.0%	1	.5%
	15	0	.0%	1	.5%
	17	0	.0%	1	.5%
	2	1	.4%	5	2.3%
	2, 11, 12, 15, 16, 17	4	1.6%	0	.0%
	2, 11, 12, 15, 16, 17	5	2.0%	2	.9%
	2, 9	1	.4%	2	.9%
	21	3	1.2%	0	.0%
	3	7	2.8%	11	5.2%
	3, 11, 12, 15, 16, 17	4	1.6%	0	.0%
	3, 11, 12, 15, 16, 17	2	.8%	1	.5%
	3, 6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	3, 9	0	.0%	8	3.8%
	4	6	2.4%	3	1.4%
	4, 5, 6	1	.4%	0	.0%
	5	1	.4%	0	.0%
	6	26	10.3%	22	10.3%
	7	1	.4%	2	.9%
	9, 15, 21	1	.4%	0	.0%
	0	84	33.2%	99	46.5%
	1	81	32.0%	46	21.6%
	1, 3	1	.4%	1	.5%
	1, 3, 4	0	.0%	1	.5%
	1, 4	1	.4%	0	.0%
	1, 5	0	.0%	1	.5%
	1, 6	2	.8%	0	.0%
	1, 9	0	.0%	1	.5%
	10	37	14.6%	29	13.6%
	11	1	.4%	1	.5%
	11, 12, 13, 15, 16, 17	3	1.2%	1	.5%
	11, 12, 15	0	.0%	1	.5%
	11, 12, 15, 16, 17	1	.4%	0	.0%
	11, 13	0	.0%	1	.5%
	11, 15, 16, 17	1	.4%	0	.0%
	11, 16, 17	0	.0%	1	.5%

	15	1	.4%	0	.0%
	2	1	.4%	3	1.4%
	3	3	1.2%	2	.9%
	4	14	5.5%	7	3.3%
	5	2	.8%	2	.9%
	5, 6, 7, 8, 9, 10, 11	0	.0%	1	.5%
	6	20	7.9%	14	6.6%
	7	0	.0%	1	.5%
DECISION.4: Decision-making controlled by	0	1	.4%	3	1.4%
	1	168	66.4%	132	62.0%
	1, 21	0	.0%	2	.9%
	1, 3	8	3.2%	6	2.8%
	1, 3, 4	5	2.0%	3	1.4%
	1, 6	2	.8%	2	.9%
	10	16	6.3%	16	7.5%
	11	1	.4%	0	.0%
	2	18	7.1%	12	5.6%
	2, 21	1	.4%	0	.0%
	21	3	1.2%	3	1.4%
	3	14	5.5%	19	8.9%
	3, 4	2	.8%	0	.0%
	4	4	1.6%	3	1.4%
	6	9	3.6%	12	5.6%
	7	1	.4%	0	.0%

#### Pearson Chi-Square Tests for “Land Preparation Servicing”

		CORN
CAPITAL.4:	Chi-square	71.286
Capital provided by	df	50
	Sig.	.026(*,a,b)
FINANCES.4:	Chi-square	68.271
Finances an other resources controlled by	df	40
	Sig.	.004(*,a,b)
FARM_TEC.4:	Chi-square	28.211
Farm technology owned and controlled by	df	23
	Sig.	.208(a,b)
DECISION.4:	Chi-square	12.292

Decision-making	df	15
controlled by	Sig.	.657(a,b)

Results are based on nonempty rows and columns in each innermost subtable.

\* The Chi-square statistic is significant at the 0.05 level.

a More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.

b The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

**Table 6.5. Inputs Distributing**

		CORN			
		Bt		NonBt	
		Count	Layer Column %	Count	Layer Column %
CAPITAL.5: Capital provided by	0	85	33.6%	108	50.7%
	1	49	19.4%	29	13.6%
	1, 15, 16, 17	0	.0%	1	.5%
	1, 21	1	.4%	0	.0%
	1, 3, 11, 15, 16, 17	1	.4%	0	.0%
	1, 6	13	5.1%	5	2.3%
	1, 9, 10, 11, 12, 15, 16, 17, 21, 22	1	.4%	0	.0%
	1, 9, 10, 11, 15, 16, 17, 21, 22	0	.0%	1	.5%
	1, 9, 10, 11, 15, 21, 22	1	.4%	0	.0%
	1, 9, 10, 15, 16, 17, 21, 22	2	.8%	0	.0%
	10	26	10.3%	18	8.5%
	11	8	3.2%	5	2.3%
	12	1	.4%	0	.0%
	15	2	.8%	3	1.4%
	17	0	.0%	1	.5%
	2	1	.4%	0	.0%
	21	14	5.5%	4	1.9%
	3	1	.4%	0	.0%
	4	2	.8%	2	.9%
	4, 5, 6	1	.4%	0	.0%
	6	42	16.6%	33	15.5%
	7	2	.8%	2	.9%
	9	0	.0%	1	.5%
FINANCES.5: Finances an other resources controlled by	0	1	.4%	6	2.8%
	1	73	28.9%	38	17.8%
	1, 11, 12, 15, 16, 17	5	2.0%	0	.0%
	1, 11, 12, 15, 16, 17	1	.4%	1	.5%
	1, 11, 12, 15, 16, 17	16	6.3%	3	1.4%
	1, 11, 12, 15, 16, 17, 21	1	.4%	1	.5%

FARM_TEC.5: Farm technology owned and controlled by	1, 11, 12, 15, 17	1	.4%	0	.0%
	1, 11, 15, 16, 17	1	.4%	0	.0%
	1, 13, 15, 17	0	.0%	1	.5%
	1, 15, 16, 17	1	.4%	0	.0%
	1, 3	0	.0%	1	.5%
	1, 3, 11, 12, 15 ,16, 17	2	.8%	0	.0%
	1, 3, 11, 12, 15, 16, 17	1	.4%	1	.5%
	1, 6	14	5.5%	4	1.9%
	1, 6, 11, 12 ,15, 16, 17	3	1.2%	2	.9%
	1, 6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	10	15	5.9%	13	6.1%
	11	8	3.2%	8	3.8%
	11, 12	9	3.6%	12	5.6%
	11, 12, 15	23	9.1%	72	33.8%
	11, 12, 15, 16, 17	1	.4%	1	.5%
	11, 15	5	2.0%	3	1.4%
	12	1	.4%	0	.0%
	15	1	.4%	4	1.9%
	17	0	.0%	1	.5%
	2	2	.8%	0	.0%
	2, 11, 12, 15, 16, 17	4	1.6%	0	.0%
	2, 11, 12, 15, 16, 17	5	2.0%	2	.9%
	21	1	.4%	0	.0%
	3	6	2.4%	1	.5%
	3, 11, 12, 15, 16, 17	4	1.6%	0	.0%
	3, 11, 12, 15, 16, 17	2	.8%	1	.5%
	3, 6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	4	4	1.6%	1	.5%
	4, 5, 6	1	.4%	0	.0%
	6	37	14.6%	33	15.5%
	7	1	.4%	3	1.4%
	9, 15, 21	1	.4%	0	.0%
	0	13	5.1%	10	4.7%
	1	72	28.5%	39	18.3%
	1, 15	1	.4%	0	.0%
	1, 6	13	5.1%	5	2.3%
	10	13	5.1%	13	6.1%
	11	7	2.8%	7	3.3%
	11, 12	8	3.2%	11	5.2%

DECISION.5: Decision-making controlled by	11, 12, 13, 15, 16, 17	3	1.2%	1	.5%
	11, 12, 15	21	8.3%	71	33.3%
	11, 12, 15, 16, 17	43	17.0%	11	5.2%
	11, 13	0	.0%	2	.9%
	11, 15	1	.4%	1	.5%
	11, 15, 16, 17	2	.8%	0	.0%
	11, 16, 17	0	.0%	1	.5%
	12, 15, 16, 17	1	.4%	0	.0%
	15	3	1.2%	4	1.9%
	17	0	.0%	1	.5%
	2	0	.0%	1	.5%
	21	1	.4%	0	.0%
	3	5	2.0%	1	.5%
	4	6	2.4%	2	.9%
	5	1	.4%	1	.5%
	6	35	13.8%	29	13.6%
	6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	7	2	.8%	2	.9%
	9	1	.4%	0	.0%
	0	1	.4%	5	2.3%
	1	150	59.3%	121	56.8%
	1, 21	0	.0%	2	.9%
	1, 3	8	3.2%	6	2.8%
	1, 3, 4	5	2.0%	3	1.4%
	1, 4	1	.4%	0	.0%
	1, 6	13	5.1%	5	2.3%
	10	11	4.3%	12	5.6%
	11	2	.8%	2	.9%
	15	1	.4%	1	.5%
	18	0	.0%	1	.5%
	2	15	5.9%	9	4.2%
	2, 21	1	.4%	0	.0%
	21	3	1.2%	3	1.4%
	3	14	5.5%	19	8.9%
	3, 4	2	.8%	0	.0%
	4	2	.8%	3	1.4%
	6	23	9.1%	20	9.4%
	7	1	.4%	1	.5%



### Pearson Chi-Square Tests for “Inputs Distributing”

		CORN
CAPITAL.5: Capital provided by	Chi-square	31.204
	df	22
	Sig.	.092(a,b)
FINANCES.5: Finances an other resources controlled by	Chi-square	91.865
	df	37
	Sig.	.000(*,a,b)
FARM_TEC.5: Farm technology owned and controlled by	Chi-square	75.866
	df	25
	Sig.	.000(*,a,b)
DECISION.5: Decision-making controlled by	Chi-square	16.510
	df	18
	Sig.	.557(a,b)

Results are based on nonempty rows and columns in each innermost subtable.

\* The Chi-square statistic is significant at the 0.05 level.

a More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.

b The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

**Table 6.6 Inputs Supplying**

		CORN			
		Bt		NonBt	
		Count	Layer Column %	Count	Layer Column %
CAPITAL.6: Capital provided by	0	85	33.6%	103	48.4%
	1	40	15.8%	24	11.3%
	1, 15, 16, 17	0	.0%	1	.5%
	1, 3, 11, 15, 16, 17	1	.4%	0	.0%
	1, 6	12	4.7%	5	2.3%
	1, 9, 10, 11, 12, 15, 16, 17, 21, 22	1	.4%	0	.0%
	1, 9, 10, 11, 15, 16, 17, 21, 22	0	.0%	1	.5%
	1, 9, 10, 11, 15, 21, 22	1	.4%	0	.0%
	1, 9, 10, 15, 16, 17, 21, 22	2	.8%	0	.0%
	10	27	10.7%	19	8.9%
	11	3	1.2%	3	1.4%
	15	2	.8%	2	.9%
	17	0	.0%	2	.9%
	21	16	6.3%	6	2.8%
	3	1	.4%	0	.0%
	4	3	1.2%	1	.5%
	4, 5, 6	1	.4%	0	.0%
	6	52	20.6%	42	19.7%
	6, 11	0	.0%	1	.5%
	7	5	2.0%	2	.9%
	9	1	.4%	1	.5%
FINANCES.6: Finances an other resources controlled by	0	1	.4%	3	1.4%
	1	63	24.9%	34	16.0%
	1, 11, 12, 15, 16, 17	5	2.0%	0	.0%
	1, 11, 12, 15, 16, 17	1	.4%	1	.5%
	1, 11, 12, 15, 16, 17	16	6.3%	3	1.4%
	1, 11, 12, 15, 16, 17, 21	1	.4%	1	.5%
	1, 11, 12, 15, 17	1	.4%	0	.0%
	1, 11, 15, 16, 17	1	.4%	0	.0%
	1, 13, 15, 17	0	.0%	1	.5%
	1, 15, 16, 17	1	.4%	0	.0%

FARM_TEC.6: Farm technology owned and controlled by	1, 3	0	.0%	1	.5%
	1, 3, 11, 12, 15 ,16, 17	2	.8%	0	.0%
	1, 3, 11, 12, 15, 16, 17	1	.4%	1	.5%
	1, 6	12	4.7%	4	1.9%
	1, 6, 11, 12 ,15, 16, 17	3	1.2%	2	.9%
	1, 6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	10	18	7.1%	15	7.0%
	11	3	1.2%	5	2.3%
	11, 12	1	.4%	0	.0%
	11, 12, 15	23	9.1%	71	33.3%
	11, 12, 15, 16, 17	1	.4%	1	.5%
	11, 15	5	2.0%	3	1.4%
	15	12	4.7%	16	7.5%
	17	2	.8%	2	.9%
	2	1	.4%	0	.0%
	2, 11, 12, 15, 16, 17	4	1.6%	0	.0%
	2, 11, 12, 15, 16, 17	5	2.0%	2	.9%
	21	1	.4%	3	1.4%
	3	6	2.4%	1	.5%
	3, 11, 12, 15, 16, 17	4	1.6%	0	.0%
	3, 11, 12, 15, 16, 17	2	.8%	1	.5%
	3, 6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	4	1	.4%	1	.5%
	4, 5, 6	1	.4%	0	.0%
	6	47	18.6%	37	17.4%
	7	4	1.6%	2	.9%
	7, 6	0	.0%	1	.5%
	9	1	.4%	1	.5%
	9, 15, 21	1	.4%	0	.0%
	0	12	4.7%	8	3.8%
	1	66	26.1%	37	17.4%
	1, 6	13	5.1%	4	1.9%
	10	14	5.5%	13	6.1%
	11	6	2.4%	8	3.8%
	11, 12, 13, 15, 16, 17	3	1.2%	1	.5%
	11, 12, 15	21	8.3%	70	32.9%
	11, 12, 15, 16, 17	43	17.0%	11	5.2%
	11, 13	0	.0%	1	.5%
	11, 15	1	.4%	1	.5%

DECISION.6: Decision-making controlled by	11, 15, 16, 17	2	.8%	0	.0%
	11, 16, 17	0	.0%	1	.5%
	12, 15, 16, 17	1	.4%	0	.0%
	15	12	4.7%	14	6.6%
	17	0	.0%	2	.9%
	21	1	.4%	2	.9%
	3	5	2.0%	1	.5%
	4	5	2.0%	1	.5%
	5	4	1.6%	2	.9%
	6	41	16.2%	34	16.0%
	6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	6, 7	0	.0%	1	.5%
	7	1	.4%	1	.5%
	8	1	.4%	0	.0%
	0	2	.8%	4	1.9%
	1	147	58.1%	123	57.7%
	1, 2	0	.0%	1	.5%
	1, 21	0	.0%	2	.9%
	1, 3	8	3.2%	6	2.8%
	1, 3, 4	5	2.0%	3	1.4%
	1, 6	13	5.1%	4	1.9%
	10	11	4.3%	12	5.6%
	11	1	.4%	2	.9%
	11, 15	1	.4%	0	.0%
	15	2	.8%	1	.5%
	17	1	.4%	0	.0%
	18	0	.0%	1	.5%
	2	15	5.9%	7	3.3%
	2, 21	1	.4%	0	.0%
	21	3	1.2%	4	1.9%
	3	14	5.5%	18	8.5%
	3, 4	2	.8%	0	.0%
	4	1	.4%	2	.9%
	6	24	9.5%	22	10.3%
	7	2	.8%	1	.5%

**Pearson Chi-Square Tests for “Inputs Supplying”**

		CORN
CAPITAL.6: Capital provided by	Chi-square	26.655
	df	20
	Sig.	.145(a,b)
FINANCES.6: Finances an other resources controlled by	Chi-square	81.333
	df	38
	Sig.	.000(*,a,b)
FARM_TEC.6: Farm technology owned and controlled by	Chi-square	74.657
	df	23
	Sig.	.000(*,a,b)
DECISION.6: Decision-making controlled by	Chi-square	19.073
	df	20
	Sig.	.517(a,b)

Results are based on nonempty rows and columns in each innermost subtable.

\* The Chi-square statistic is significant at the 0.05 level.

a More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.

b The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

**Table 6.7. Field Transporting**

		CORN			
		Bt		NonBt	
		Count	Layer Column %	Count	Layer Column %
CAPITAL.7: Capital provided by	0	85	33.6%	105	49.3%
	1	44	17.4%	38	17.8%
	1, 15, 16, 17	0	.0%	1	.5%
	1, 3, 11, 15, 16, 17	1	.4%	0	.0%
	1, 6	5	2.0%	1	.5%
	1, 9, 10, 11, 12, 15, 16, 17, 21, 22	1	.4%	0	.0%
	1, 9, 10, 11, 15, 16, 17, 21, 22	0	.0%	1	.5%
	1, 9, 10, 11, 15, 21, 22	1	.4%	0	.0%
	1, 9, 10, 15, 16, 17, 21, 22	2	.8%	0	.0%
	10	28	11.1%	15	7.0%
	11	0	.0%	1	.5%
	12	2	.8%	2	.9%
	15	3	1.2%	0	.0%
	16	0	.0%	1	.5%
	17	15	5.9%	11	5.2%
	2	0	.0%	1	.5%
	21	14	5.5%	4	1.9%
	3	1	.4%	0	.0%
	4	3	1.2%	2	.9%
	6	39	15.4%	26	12.2%
	7	9	3.6%	4	1.9%
FINANCES.7: Finances an other resources controlled by	0	10	4.0%	10	4.7%
	1	72	28.5%	47	22.1%
	1, 11, 12, 15, 16, 17	5	2.0%	0	.0%
	1, 11, 12, 15, 16, 17	1	.4%	1	.5%
	1, 11, 12, 15, 16, 17	16	6.3%	3	1.4%
	1, 11, 12, 15, 16, 17, 21	1	.4%	1	.5%
	1, 11, 12, 15, 17	1	.4%	0	.0%
	1, 11, 15, 16, 17	1	.4%	0	.0%
	1, 13, 15, 17	0	.0%	1	.5%

FARM_TEC.7: Farm technology owned and controlled by	1, 15, 16, 17	1	.4%	0	.0%
	1, 21	1	.4%	0	.0%
	1, 3	0	.0%	1	.5%
	1, 3, 11, 12, 15 ,16, 17	2	.8%	0	.0%
	1, 3, 11, 12, 15, 16, 17	1	.4%	1	.5%
	1, 6	3	1.2%	1	.5%
	1, 6, 11, 12 ,15, 16, 17	3	1.2%	2	.9%
	1, 6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	10	18	7.1%	10	4.7%
	11, 12, 15, 16, 17	1	.4%	1	.5%
	12	2	.8%	0	.0%
	15	1	.4%	0	.0%
	16	2	.8%	1	.5%
	17	44	17.4%	92	43.2%
	2	1	.4%	0	.0%
	2, 11, 12, 15, 16, 17	4	1.6%	0	.0%
	2, 11, 12, 15, 16, 17	5	2.0%	2	.9%
	21	8	3.2%	5	2.3%
	3	6	2.4%	1	.5%
	3, 11, 12, 15, 16, 17	4	1.6%	0	.0%
	3, 11, 12, 15, 16, 17	2	.8%	1	.5%
	3, 6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	4	6	2.4%	2	.9%
	6	28	11.1%	26	12.2%
	7	1	.4%	4	1.9%
	0	3	1.2%	6	2.8%
	1	51	20.2%	31	14.6%
	1, 21	1	.4%	0	.0%
	1, 6	5	2.0%	1	.5%
	10	30	11.9%	23	10.8%
	11	3	1.2%	4	1.9%
	11, 12, 13, 15, 16, 17	3	1.2%	1	.5%
	11, 12, 15, 16, 17	43	17.0%	11	5.2%
	11, 13	0	.0%	1	.5%
	11, 15, 16, 17	2	.8%	0	.0%
	11, 16, 17	0	.0%	1	.5%
	12	1	.4%	0	.0%
	12, 15, 16, 17	1	.4%	0	.0%
	14	1	.4%	0	.0%

DECISION.7: Decision-making controlled by	16	0	.0%	1	.5%
	17	55	21.7%	101	47.4%
	18	0	.0%	1	.5%
	21	9	3.6%	3	1.4%
	3	0	.0%	1	.5%
	4	6	2.4%	2	.9%
	5	0	.0%	1	.5%
	6	37	14.6%	23	10.8%
	6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	7	1	.4%	1	.5%
	0	2	.8%	5	2.3%
	1	150	59.3%	126	59.2%
	1, 21	1	.4%	2	.9%
	1, 3	8	3.2%	6	2.8%
	1, 3, 4	5	2.0%	3	1.4%
	1, 6	3	1.2%	1	.5%
	10	11	4.3%	11	5.2%
	11	1	.4%	0	.0%
	12	1	.4%	0	.0%
	13	0	.0%	1	.5%
	14	2	.8%	0	.0%
	17	12	4.7%	8	3.8%
	2	13	5.1%	8	3.8%
	2, 21	1	.4%	0	.0%
	21	9	3.6%	6	2.8%
	3	14	5.5%	18	8.5%
	3, 4	2	.8%	0	.0%
	4	2	.8%	3	1.4%
	6	15	5.9%	14	6.6%
	7	1	.4%	1	.5%

#### Pearson Chi-Square Tests for “Field Transporting”

		CORN
CAPITAL.7: Capital provided by	Chi-square	30.829
	df	20
	Sig.	.057(a,b)
FINANCES.7:	Chi-square	68.737



Finances an other	df	33
resources	Sig.	.000(*,a,b)
controlled by		
FARM_TEC.7:	Chi-square	61.425
Farm technology	df	23
owned and	Sig.	.000(*,a,b)
controlled by		
DECISION.7:	Chi-square	13.483
Decision-making	df	19
controlled by	Sig.	.813(a,b)

Results are based on nonempty rows and columns in each innermost subtable.

\* The Chi-square statistic is significant at the 0.05 level.

a More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.

b The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

**Table 6.8. Post-harvest Facility Shelling**

		CORN			
		Bt		NonBt	
		Count	Layer Column %	Count	Layer Column %
CAPITAL.8: Capital provided by	0	84	33.2%	100	46.9%
	1	46	18.2%	36	16.9%
	1, 15, 16, 17	0	.0%	1	.5%
	1, 16	8	3.2%	2	.9%
	1, 3, 11, 15, 16, 17	1	.4%	0	.0%
	1, 6	2	.8%	2	.9%
	1, 9, 10, 11, 12, 15, 16, 17, 21, 22	1	.4%	0	.0%
	1, 9, 10, 11, 15, 16, 17, 21, 22	0	.0%	1	.5%
	1, 9, 10, 11, 15, 21, 22	1	.4%	0	.0%
	1, 9, 10, 15, 16, 17, 21, 22	2	.8%	0	.0%
	10	12	4.7%	7	3.3%
	12	3	1.2%	1	.5%
	13	2	.8%	0	.0%
	14	0	.0%	1	.5%
	15	2	.8%	3	1.4%
	16	40	15.8%	32	15.0%
	17	1	.4%	1	.5%
	2	2	.8%	0	.0%
	21	14	5.5%	7	3.3%
	4	7	2.8%	3	1.4%
	6	21	8.3%	15	7.0%
	7	4	1.6%	0	.0%
	7,16	0	.0%	1	.5%
FINANCES.8: Finances an other resources controlled by	0	11	4.3%	8	3.8%
	1	66	26.1%	40	18.8%
	1, 11, 12, 15, 16, 17	5	2.0%	0	.0%
	1, 11, 12, 15, 16, 17	1	.4%	1	.5%
	1, 11, 12, 15, 16, 17	16	6.3%	3	1.4%
	1, 11, 12, 15, 16, 17, 21	1	.4%	1	.5%

FARM_TEC.8: Farm technology owned and controlled by	1, 11, 12, 15, 17	1	.4%	0	.0%
	1, 11, 15, 16, 17	1	.4%	0	.0%
	1, 13, 15, 17	0	.0%	1	.5%
	1, 15, 16, 17	1	.4%	0	.0%
	1, 16	9	3.6%	2	.9%
	1, 21	1	.4%	2	.9%
	1, 3	0	.0%	1	.5%
	1, 3, 11, 12, 15, 16, 17	2	.8%	0	.0%
	1, 3, 11, 12, 15, 16, 17	1	.4%	1	.5%
	1, 6	1	.4%	2	.9%
	1, 6, 11, 12, 15, 16, 17	3	1.2%	2	.9%
	1, 6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	10	4	1.6%	3	1.4%
	11, 12, 15, 16, 17	1	.4%	1	.5%
	12	2	.8%	3	1.4%
	15	2	.8%	1	.5%
	16	67	26.5%	110	51.6%
	17	0	.0%	3	1.4%
	2	2	.8%	0	.0%
	2, 11, 12, 15, 16, 17	4	1.6%	0	.0%
	2, 11, 12, 15, 16, 17	5	2.0%	2	.9%
	21	8	3.2%	3	1.4%
	3	5	2.0%	1	.5%
	3, 11, 12, 15, 16, 17	4	1.6%	0	.0%
	3, 11, 12, 15, 16, 17	2	.8%	1	.5%
	3, 6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	4	9	3.6%	5	2.3%
	5	1	.4%	1	.5%
	6	14	5.5%	14	6.6%
	7	1	.4%	0	.0%
	9	0	.0%	1	.5%
	0	2	.8%	2	.9%
	1	38	15.0%	26	12.2%
	1, 16	9	3.6%	2	.9%
	1, 21	1	.4%	1	.5%
	1, 4	0	.0%	1	.5%
	1, 5	0	.0%	1	.5%
	1, 6	2	.8%	2	.9%
	10	19	7.5%	13	6.1%

DECISION.8: Decision-making controlled by	11	1	.4%	1	.5%
	11, 12, 13, 15, 16, 17	3	1.2%	1	.5%
	11, 12, 15, 16, 17	43	17.0%	11	5.2%
	11, 13	0	.0%	1	.5%
	11, 15, 16, 17	2	.8%	0	.0%
	11, 16, 17	0	.0%	1	.5%
	12	1	.4%	1	.5%
	12, 15, 16, 17	1	.4%	0	.0%
	13	2	.8%	0	.0%
	15	1	.4%	0	.0%
	16	83	32.8%	118	55.4%
	17	1	.4%	2	.9%
	18	0	.0%	1	.5%
	2	3	1.2%	0	.0%
	21	10	4.0%	4	1.9%
	3	0	.0%	1	.5%
	4	15	5.9%	10	4.7%
	5	0	.0%	4	1.9%
	6	11	4.3%	8	3.8%
	6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	7	4	1.6%	0	.0%
	9	0	.0%	1	.5%
	0	2	.8%	2	.9%
	1	140	55.3%	121	56.8%
	1, 16	9	3.6%	2	.9%
	1, 21	1	.4%	3	1.4%
	1, 3	8	3.2%	6	2.8%
	1, 3, 4	5	2.0%	3	1.4%
	1, 6	1	.4%	2	.9%
	10	4	1.6%	3	1.4%
	12	1	.4%	0	.0%
	13	1	.4%	0	.0%
	15	1	.4%	0	.0%
	16	26	10.3%	23	10.8%
	17	0	.0%	1	.5%
	2	16	6.3%	9	4.2%
	2, 21	1	.4%	0	.0%
	21	7	2.8%	5	2.3%
	3	14	5.5%	19	8.9%

3, 4	2	.8%	0	.0%
4	7	2.8%	5	2.3%
5	2	.8%	0	.0%
6	4	1.6%	5	2.3%
7	1	.4%	2	.9%
9	0	.0%	2	.9%

### Pearson Chi-Square Tests for “Post-harvest Facility Shelling”

		CORN
CAPITAL.8: Capital provided by	Chi-square	28.324
	df	22
	Sig.	.165(a,b)
FINANCES.8: Finances an other resources controlled by	Chi-square	65.943
	df	36
	Sig.	.002(*,a,b)
FARM_TEC.8: Farm technology owned and controlled by	Chi-square	60.276
	df	29
	Sig.	.001(*,a,b)
DECISION.8: Decision-making controlled by	Chi-square	19.825
	df	22
	Sig.	.594(a,b)

Results are based on nonempty rows and columns in each innermost subtable.

\* The Chi-square statistic is significant at the 0.05 level.

a More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.

b The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

**Table 6.9. Delivery Trucking**

		CORN			
		Bt		NonBt	
		Count	Layer Column %	Count	Layer Column %
CAPITAL.9: Capital provided by	0	84	33.2%	103	48.4%
	1	18	7.1%	16	7.5%
	1, 15, 16, 17	0	.0%	1	.5%
	1, 17	1	.4%	0	.0%
	1, 3, 11, 15, 16, 17	1	.4%	0	.0%
	1, 6	2	.8%	0	.0%
	1, 9, 10, 11, 12, 15, 16, 17, 21, 22	1	.4%	0	.0%
	1, 9, 10, 11, 15, 16, 17, 21, 22	0	.0%	1	.5%
	1, 9, 10, 11, 15, 21, 22	1	.4%	0	.0%
	1, 9, 10, 15, 16, 17, 21, 22	2	.8%	0	.0%
	10	28	11.1%	21	9.9%
	15	0	.0%	1	.5%
	16	1	.4%	0	.0%
	17	21	8.3%	18	8.5%
	21	14	5.5%	6	2.8%
	4	4	1.6%	1	.5%
	6	63	24.9%	42	19.7%
	7	12	4.7%	3	1.4%
FINANCES.9: Finances an other resources controlled by	0	11	4.3%	10	4.7%
	1	46	18.2%	29	13.6%
	1, 11, 12, 15, 16, 17	5	2.0%	0	.0%
	1, 11, 12, 15, 16, 17	1	.4%	1	.5%
	1, 11, 12, 15, 16, 17	16	6.3%	3	1.4%
	1, 11, 12, 15, 16, 17, 21	1	.4%	1	.5%
	1, 11, 12, 15, 17	1	.4%	0	.0%
	1, 11, 15, 16, 17	1	.4%	0	.0%
	1, 13, 15, 17	0	.0%	1	.5%
	1, 15, 16, 17	1	.4%	0	.0%
	1, 17	1	.4%	0	.0%
	1, 3	0	.0%	1	.5%

FARM_TEC.9: Farm technology owned and controlled by	1, 3, 11, 12, 15 ,16, 17	2	.8%	0	.0%
	1, 3, 11, 12, 15, 16, 17	1	.4%	1	.5%
	1, 6	2	.8%	0	.0%
	1, 6, 11, 12 ,15, 16, 17	3	1.2%	2	.9%
	1, 6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	10	21	8.3%	16	7.5%
	11, 12, 15, 16, 17	1	.4%	1	.5%
	16	0	.0%	1	.5%
	17	48	19.0%	96	45.1%
	2, 11, 12, 15, 16, 17	4	1.6%	0	.0%
	2, 11, 12, 15, 16, 17	5	2.0%	2	.9%
	21	11	4.3%	5	2.3%
	3	5	2.0%	1	.5%
	3, 11, 12, 15, 16, 17	4	1.6%	0	.0%
	3, 11, 12, 15, 16, 17	2	.8%	1	.5%
	3, 6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	4	4	1.6%	2	.9%
	6	52	20.6%	36	16.9%
	7	1	.4%	3	1.4%
	9	1	.4%	0	.0%
	0	1	.4%	6	2.8%
	1	31	12.3%	18	8.5%
	1, 17	1	.4%	0	.0%
	1, 6	4	1.6%	0	.0%
	10	32	12.6%	23	10.8%
	11	0	.0%	1	.5%
	11, 12, 13, 15, 16, 17	3	1.2%	1	.5%
	11, 12, 15, 16, 17	43	17.0%	11	5.2%
	11, 13	0	.0%	1	.5%
	11, 15, 16, 17	2	.8%	0	.0%
	11, 16, 17	0	.0%	1	.5%
	12, 15, 16, 17	1	.4%	0	.0%
	13, 14, 17	0	.0%	1	.5%
	14	1	.4%	0	.0%
	14, 17	0	.0%	1	.5%
	17	54	21.3%	100	46.9%
	21	12	4.7%	5	2.3%
	3	0	.0%	1	.5%
	4	4	1.6%	2	.9%

DECISION.9: Decision-making controlled by	5	0	.0%	1	.5%
	6	59	23.3%	39	18.3%
	6, 11, 12, 15, 16, 17	1	.4%	0	.0%
	7	4	1.6%	1	.5%
	0	4	1.6%	9	4.2%
	1	131	51.8%	112	52.6%
	1, 17	1	.4%	0	.0%
	1, 21	0	.0%	2	.9%
	1, 3	8	3.2%	6	2.8%
	1, 3, 4	5	2.0%	3	1.4%
	1, 6	2	.8%	0	.0%
	10	10	4.0%	11	5.2%
	13	2	.8%	0	.0%
	17	12	4.7%	11	5.2%
	2	14	5.5%	11	5.2%
	2, 21	1	.4%	0	.0%
	21	12	4.7%	7	3.3%
	3	15	5.9%	18	8.5%
	3, 4	2	.8%	0	.0%
	4	4	1.6%	2	.9%
	6	28	11.1%	19	8.9%
	7	2	.8%	2	.9%

### Pearson Chi-Square Tests for “Delivery Trucking”

		CORN
CAPITAL.9: Capital provided by	Chi-square	26.642
	df	17
	Sig.	.064(a,b)
FINANCES.9: Finances an other resources controlled by	Chi-square	64.827
	df	31
	Sig.	.000(*,a,b)
FARM_TEC.9: Farm technology owned and controlled by	Chi-square	65.677
	df	22
	Sig.	.000(*,a,b)
DECISION.9: Decision-making controlled by	Chi-square	15.303
	df	17
	Sig.	.574(a,b)



Results are based on nonempty rows and columns in each innermost subtable.

\* The Chi-square statistic is significant at the 0.05 level.

a More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.

b The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

**Table 6.10. Barangay Aggregate Trading**

		CORN			
		Bt		NonBt	
		Count	Layer Column %	Count	Layer Column %
CAPITAL.10: Capital provided by	0	131	51.8%	137	64.3%
	1	33	13.0%	17	8.0%
	10	12	4.7%	11	5.2%
	21	11	4.3%	5	2.3%
	3	1	.4%	0	.0%
	4	0	.0%	1	.5%
	6	63	24.9%	39	18.3%
	7	2	.8%	3	1.4%
FINANCES.1 0: Finances an other resources controlled by	0	131	51.8%	137	64.3%
	1	33	13.0%	14	6.6%
	10	13	5.1%	11	5.2%
	17	1	.4%	0	.0%
	21	11	4.3%	5	2.3%
	4	2	.8%	1	.5%
	6	60	23.7%	43	20.2%
	7	2	.8%	2	.9%
FARM_TEC. 10: Farm technology owned and controlled by	0	131	51.8%	138	64.8%
	1	33	13.0%	15	7.0%
	1, 6	1	.4%	0	.0%
	10	13	5.1%	11	5.2%
	17	0	.0%	1	.5%
	21	11	4.3%	5	2.3%
	3	1	.4%	0	.0%
	4	2	.8%	1	.5%
	6	60	23.7%	41	19.2%
	7	1	.4%	1	.5%
DECISION.1 0: Decision- making controlled by	0	131	51.8%	138	64.8%
	1	40	15.8%	19	8.9%
	10	13	5.1%	11	5.2%
	12	1	.4%	0	.0%
	13	0	.0%	1	.5%
	19	1	.4%	0	.0%
	2	3	1.2%	0	.0%

21	12	4.7%	7	3.3%
4	1	.4%	1	.5%
6	49	19.4%	35	16.4%
7	2	.8%	1	.5%

#### Pearson Chi-Square Tests for “Barangay Aggregate Trading”

		CORN
CAPITAL.10: Capital provided by	Chi-square	12.050
	df	7
	Sig.	.099(a,b)
FINANCES.10: Finances an other resources controlled by	Chi-square	11.019
	df	7
	Sig.	.138(a,b)
FARM_TEC.10: Farm technology owned and controlled by	Chi-square	12.918
	df	9
	Sig.	.166(a,b)
DECISION.10: Decision-making controlled by	Chi-square	14.479
	df	10
	Sig.	.152(a,b)

Results are based on nonempty rows and columns in each innermost subtable.

a More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.

b The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

**Table 6.11. Municipal Aggregate Trading**

		CORN			
		Bt		NonBt	
		Count	Layer Column %	Count	Layer Column %
CAPITAL.11: Capital provided by	0	102	40.3%	119	55.9%
	1	29	11.5%	18	8.5%
	10	1	.4%	0	.0%
	13	0	.0%	1	.5%
	21	11	4.3%	5	2.3%
	5	2	.8%	0	.0%
	6	102	40.3%	62	29.1%
	7	6	2.4%	8	3.8%
FINANCES.1 1: Finances an other resources controlled by	0	102	40.3%	119	55.9%
	1	30	11.9%	15	7.0%
	10	1	.4%	0	.0%
	13	0	.0%	1	.5%
	21	11	4.3%	5	2.3%
	4	1	.4%	0	.0%
	5	1	.4%	0	.0%
	6	101	39.9%	66	31.0%
	7	5	2.0%	7	3.3%
	9	1	.4%	0	.0%
FARM_TEC. 11: Farm technology owned and controlled by	0	103	40.7%	119	55.9%
	1	31	12.3%	15	7.0%
	1, 6	1	.4%	0	.0%
	10	1	.4%	0	.0%
	12	1	.4%	0	.0%
	13	0	.0%	1	.5%
	21	11	4.3%	5	2.3%
	4	1	.4%	0	.0%
	5	1	.4%	0	.0%
	6	100	39.5%	69	32.4%
	7	3	1.2%	4	1.9%
DECISION.1 1: Decision- making	0	102	40.3%	119	55.9%
	1	39	15.4%	23	10.8%

controlled by	10	1	.4%	2	.9%
	14	0	.0%	1	.5%
	17	1	.4%	0	.0%
	2	3	1.2%	0	.0%
	21	11	4.3%	5	2.3%
	4	1	.4%	1	.5%
	5	1	.4%	1	.5%
	6	92	36.4%	59	27.7%
	7	2	.8%	2	.9%

### Pearson Chi-Square Tests for “Municipal Aggregate Trading”

		CORN
CAPITAL.11: Capital provided by	Chi-square	16.865
	df	7
	Sig.	.018(*,a,b)
FINANCES.11: Finances an other resources controlled by	Chi-square	17.925
	df	9
	Sig.	.036(*,a,b)
FARM_TEC.11: Farm technology owned and controlled by	Chi-square	17.493
	df	10
	Sig.	.064(a,b)
DECISION.11: Decision-making controlled by	Chi-square	16.923
	df	10
	Sig.	.076(a,b)

Results are based on nonempty rows and columns in each innermost subtable.

\* The Chi-square statistic is significant at the 0.05 level.

a More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.

b The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

**Table 6.12. Provincial Aggregate Trading**

		CORN			
		Bt		NonBt	
		Count	Layer Column %	Count	Layer Column %
CAPITAL.12:		1	.4%	0	.0%
Capital provided by	0	102	40.3%	119	55.9%
	1	29	11.5%	18	8.5%
	14	0	.0%	1	.5%
	21	11	4.3%	5	2.3%
	4	1	.4%	0	.0%
	6	25	9.9%	19	8.9%
	7	84	33.2%	51	23.9%
FINANCES.1		1	.4%	0	.0%
2: Finances	0	102	40.3%	119	55.9%
an other	1	30	11.9%	15	7.0%
resources	14	0	.0%	1	.5%
controlled by	21	11	4.3%	5	2.3%
	4	1	.4%	0	.0%
	6	29	11.5%	21	9.9%
	7	77	30.4%	52	24.4%
	9				
		2	.8%	0	.0%
FARM_TEC.		1	.4%	0	.0%
12: Farm	0	103	40.7%	119	55.9%
technology	1	31	12.3%	16	7.5%
owned and	14	0	.0%	1	.5%
controlled by	2	0	.0%	1	.5%
	21	11	4.3%	4	1.9%
	4	1	.4%	0	.0%
	5	1	.4%	0	.0%
	6	29	11.5%	24	11.3%
	7	76	30.0%	48	22.5%
DECISION.1		1	.4%	0	.0%
2: Decision-	0	102	40.3%	119	55.9%
making	1	41	16.2%	24	11.3%
controlled by					

14	0	.0%	1	.5%
16	1	.4%	0	.0%
2	2	.8%	0	.0%
21	11	4.3%	5	2.3%
4	1	.4%	1	.5%
6	23	9.1%	19	8.9%
7	71	28.1%	44	20.7%

### Pearson Chi-Square Tests for “Provincial Aggregate Trading”

		CORN
CAPITAL.12: Capital provided by	Chi-square	14.692
	df	7
	Sig.	.040(*,a,b)
FINANCES.12: Finances an other resources controlled by	Chi-square	16.370
	df	8
	Sig.	.037(*,a,b)
FARM_TEC.12: Farm technology owned and controlled by	Chi-square	17.698
	df	9
	Sig.	.039(*,a,b)
DECISION.12: Decision-making controlled by	Chi-square	16.411
	df	9
	Sig.	.059(a,b)

Results are based on nonempty rows and columns in each innermost subtable.

\* The Chi-square statistic is significant at the 0.05 level.

a More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.

b The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

**NOTES:**

Subsector 1	Seed production
Subsector 2	Corn production
Subsector 3	Corn production financing
Subsector 4	Land preparation servicing
Subsector 5	Inputs distributing
Subsector 6	Inputs supplying
Subsector 7	Field transporting
Subsector 8	Post-harvest facilities shelling
Subsector 9	Delivery trucking
Subsector 10	Brgy aggregate trading
Subsector 11	Municipal aggregate trading
Subsector 12	Provincial and district trading

## Codes:

- 1 small scale farmer (landowner)
- 2 small scale farmer (grower)
- 3 small scale farmer (tenant)
- 4 large scale farmer (landowner)
- 5 LGU agricultural office
- 6 brgy/municipal aggregator/trader
- 7 provincial/district aggregator/trader
- 8 Rural bank
- 9 Other financing institutions (e.g. Quedan)
- 10 Cooperatives
- 11 Seeds/chemicals/fertilizer company
- 12 Grains corporation
- 13 corn millers
- 14 Feed millers
- 15 Agricultural –inputs distributors
- 16 shellers
- 17 truckers
- 18 people's organization
- 19 NGO
- 20 church-based organization



21 family-member providing capital

21 relative or friend providing capital