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Abstract

When seasonal foreign farm workers with illegal resident status have left the country, farms experience difficulty in finding “motivated” equally efficient workers to fill in the void. This study’s survey and case study indicate that larger conventional farms usually opt for greater mechanization of their operations, with downsizing as another remedy. These farms also rely heavily on family members’ increased involvement in farm management. Enterprise budget analysis results suggest that when family farm labor inputs are exhausted, business losses could be realized, as yields are significantly reduced due to difficulty or delay in hiring domestic unskilled workers.

When the Seasonal Foreign Farm Workers are Gone

By Cesar L. Escalante, Samuel L. Perkins, and Florence I. Santos

Background and Introduction

The stricter enforcement of immigration policies has influenced conditions in the farm labor market as these policies affected an estimated 12 million unauthorized immigrants in the country, 40 percent of whom are hired as farm workers (Seid, 2006; Levine, 2004). These illegal workers are mostly “poorly paid and poorly treated,” (Smith, 2005) and usually hired at wages below prevailing market rates. Their displacement expectedly created a stir in the labor market as farm businesses started to rely on regular pools of potential farm workers (including those from other industries) that could probably be lured to engage in farm work if farm labor wages are increased significantly. Even if illegal immigrants succeed in properly documenting their stay in the country, the legalization of the immigration status of most of these workers will only enhance their bargaining position for better wages, in addition to the usual fringe benefits (insurance, bonuses, and others) and better working conditions. An economist from the American Farm Bureau, for instance, estimates that the immigration reform can push farm wages from the current average of \$9.50 per hour to about \$14.50 an hour as farms are constrained to hire lower-wage workers for low-skilled jobs (Seid, 2006). He foresees that the ultimate effect of immigration reforms is to raise commodity prices from five to 10 percent as farm businesses pass on the burden of higher labor costs to the consumers.



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These conditions are expected to affect the viability of farm businesses when available supply of unskilled labor is not able to fill in the gaps in a prompt and efficient manner, thus resulting in losses in yield and profitability for the farm. The logical expectation is that the economic viability of organic farms, relative to their conventional farming counterparts, could be threatened by these developments in the farm labor market. Organic farming, an economically and environmentally sustainable farming system, is a more labor-intensive operation compared to the conventional farming system that employs larger farm machineries and synthetic agrichemicals. The organic farms' characteristic limited use of synthetic chemical inputs requires them to implement alternative techniques for pest removal, soil additions, and conservation that are usually done manually. For example, certain practices that are apparently more labor-intensive include the replacement of fertilizers with nitrogen-fixing cover crops and composted animal and green manures; cultivations and hand weeding to control invasive plant species; and multi-crop rotations and often a type of comprehensive ecosystem management which creates a build-up of beneficial/predator insect species to suppress pest insects.

Organic farms in the southeastern region are poised to experience even more challenging growing conditions than their counterparts in other parts of the country. For instance, farmers in this region need to employ additional soil enhancement management techniques due to the rapid decomposition of organic matter and aggressive emergence of various pests and weeds attributed to the region's mild winters, long warm summers, and abundant moisture. Activities geared towards rebuilding soil organic matter (such as the alley cropping technique proposed by a SARE funded project, #LS06-190) define a much greater need for more labor inputs.

This study examines the business expectations of organic and conventional farms in the Southeast as contractions in the seasonal farm labor market are experienced due to the displacement of illegal immigrants as immigration policies have been strictly enforced. This study employed both quantitative (survey) and qualitative (case study) research techniques to analyze the business strategic reactions – especially those dealing with farm labor management – of organic and conventional farms. The combination of these two techniques ensured a more comprehensive approach to understanding the predicaments of organic and conventional farms in light of changing conditions of farm labor markets. The following sections lay out the theoretical and empirical frameworks, followed by discussions of this study's results and their implications.

Research Methodology

A survey was conducted among organic, transitioning, and conventional farms in Georgia, North Carolina, South Carolina, Alabama, and Mississippi. Target respondents were identified through contacts with organic farming associations, commodity groups, and local USDA agencies. The survey questionnaire gathered demographic, structural, and operating characteristics of farms as well as the producers' expectations of changes in the labor market as a result of stricter enforcement of immigration laws. Their proposed coping strategies have also been elicited in this survey. This survey was conducted in the latter half of 2007. The survey instrument was mailed to 518 organic and conventional farm operators in Georgia, South Carolina, North Carolina, Mississippi, and Alabama. Of these farms, 82 responses were received, representing a response rate of 15.8 percent.

As a complementary research tool, case studies were also conducted by visiting and interviewing pairs of organic and conventional farmers representing three selected enterprises, namely blueberries, peanuts, and soybean farms operating in Georgia. The case study approach is used in this research to develop individual profiles of business strategies employed by the farm business owners in dealing with anticipated changes in the farm labor market conditions that can affect costs and profitability of their businesses.

The case study approach has been criticized often for its lack of rigor and statistical base, and has traditionally been relegated as a teaching tool (Kennedy and Luzar, 1999). The case study approach, however, provides an alternative method for analyzing research issues that have “more variables of interest than data points ... (by using) replication logic, (instead of) sampling logic” (Kennedy and Luzar, p. 584). The approach is ideal for answering more of the “how” and “why” questions than the more objective queries and predictive analysis often employed by statistically-based models (Yin, 1994). Howard and MacMillan (1991) elaborate on this point by arguing that the case study method would be able to clearly identify the research problem and produce generalizations, exploratory problem-solving techniques, and insights/relationships that are not suggested by theory. This method is appropriate for this research given the uniqueness of each farm business to be analyzed. Moreover, personality differences among farm business owners could define various action plans for coping with expected challenges for devising cost management and/or revenue enhancement strategies to cope with the impending changes in the farm labor market conditions. Baetz and Beamish (1993) aptly describe the farm business manager's problem as rarely being solved by

one right decision, or by implementing just one optimal or approved plan of action.

This study also presents the results of an enterprise budget analysis conducted using an organic bell pepper enterprise budget created by the MALTAG (Mississippi, Alabama, Louisiana, Tennessee, Arkansas, and Georgia), which is a multi-state project collaboration that develops enterprise budgets using the Mississippi State Budget Generator (MSBG) database to standardize estimation methodologies and production system specifications across region. This analysis presents various scenarios of tradeoffs between family and unskilled farm workers in supplying the farm enterprise's labor requirements during all phases of production.

Survey Results

The summary in Table 1 presents some interesting differences in demographic and structural attributes of organic and conventional farms. Survey results indicate that conventional farms are predominantly operated by male farm operators (32 out of 40 farms) while male and female farm operators seem to almost evenly share the management of the organic farms in this survey. Conventional farms altogether seem to have been in the farming business much longer than the organic farms as their collective average farming experience is about 20 years, compared to 14 years for organic farms. On average, organic farm operators seem to have completed a college degree while the educational attainment of conventional farm operators is around the junior college/trade school level. Conventional farm operators are more experienced and older than their counterparts in the organic farming category. The average age of conventional farm operators in this sample is 53 years, with 16 and 82 years as the youngest and oldest ages recorded in this survey. Organic farm operators are about 48 years old on average. The summary in Table 1 also shows that there is not much variation in the classification of conventional and organic farmers as full-time and part-time operators. These two farm types have 58 to 60 percent of their operators working full-time on the farm. Percentage-wise (calculated within each gender class), female farm operators tend to work full-time on the farm (61%) compared to 54 percent of the male farm operators who do so.

As a starting point in dwelling with the issue of changing market labor conditions, the survey participants provided a general indication of their previous farm labor hiring experiences. Based on the results summarized in Table 2, 28 percent of our sample conventional farms never experienced any difficulty in hiring workers to complement

their existing family farm labor. The comparative proportion for organic farms is quite close at 32 percent.

Sixty-seven percent (67%) of both conventional and organic farms declared that they had experiences of difficulty in hiring such workers, with the severity of the problem ranging from periodic ("sometimes") to constant ("always") frequencies. In both farm groups and in these three categories with experiences of difficulty ("sometimes" to "always"), the periodic ("sometimes") difficulty category comprises about 30 to 33 percent of the respondents in their respective farm types.

According to the summary in Table 3, among those that provided an opinion on the effects of immigration policies on farm labor supply conditions (providing either "Yes" or "No" answers), the most popular answer in both farm groups revealed some farmers' expectations for significant changes to happen in the farm labor market (38% of conventional farms and 28% of organic farms). Combining the first two response categories, 50 percent of conventional farmers recognize a linkage between new (stricter) immigration policies and farm labor supply conditions. As for organic farms, 44 percent chose either of the two "Yes" categories.

On the other hand, 20 percent of conventional farms and 16 percent of organic farms do not foresee any immigration policy effect on farm labor supply while 35 percent of the entire survey sample did not express an opinion about any relationship between immigration policy and farm labor supply.

Table 4 tabulates the survey participants' preferences for specific business strategies for coping with seasonal farm labor shortages arising from the strict implementation of immigration policies. The respondent farmers' responses provide interesting implications that can be associated with certain structural differences between organic and conventional farms. The most popular business strategy for conventional farms (18.57%) considers an input substitution scheme where more machinery will be acquired to reduce labor requirements in the event of a farm labor hiring (or shortage) problem. This perhaps reflects the conventional farms' more mechanized (machine-dependent) existing operations that made them more familiar with this strategy. Conventional farms in this sample have been in business operation much longer than the more newly established organic farms. Farm experience and greater financial flexibility (likely resulting from their size and scale of operations) provide these farms with the capability to consider more capital investments.

The respondents in this farm category also considered downsizing of farm operations as the second most popular strategy (17.14%). This is a logical result considering that conventional farmers usually operate much larger operations (*vis-à-vis* their organic counterparts) and, thus, can consider size adjustments to achieve the right combination of minimized inputs and optimized farm production.

On the other hand, the most popular strategy for organic farms is production diversification (i.e., changing production plans to less labor-intensive commodities). Organic farms are structurally more diversified as their farms are usually planted to various types of fruits and vegetables. The need for regular crop rotation practices to enhance soil productivity expose these farmers to various production (or crop choice) options.

Both organic and conventional farms also consider relying on family members to increase their participation in the farm business when extra help from non-family workers cannot be obtained.

Case Study Results

Pairs of organic and conventional farms producing blueberries, peanuts, and soybeans were interviewed in fall 2009 on farm labor management strategies and business conditions resulting from the seasonal farm labor supply constriction. The following sections summarize the highlights of the interviews by enterprise group.

The Blueberry Farms

In addition to the small organic blueberry family farm, two more farms were interviewed for this study. The organic blueberry case farm is a 350-acre farm, of which 50 percent has already been fully converted to organic operations, with the transition phase for the rest of the acreage expected to be completed by spring of 2010. From August to March, the company has 20 employees that work about 45 hours a week to weed and prune. From April to July, they employ about 300 workers for an average of 45 hours per week to handpick and package the blueberries as well as for maintenance work.

The conventional blueberry farm operates 450 acres, of which 70 percent use conventional farming methods. The farm employs 30 full-time workers and about 450 seasonal workers. Of the eight full-time workers, four are family members who usually perform managerial functions. Seasonal workers are employed during the picking season to work an average of 100 hours a week in the field.

Table 5 presents an interesting contrast between the organic and conventional farms' allocation of farming costs. The organic case farm is more labor-intensive as 40 to 90 percent of its production and harvesting costs are accounted for by labor wages, especially for pre-planting and harvesting operations. In contrast, the conventional farm relies more heavily on its mechanized operations as machinery costs account for 60 to 80 percent of its production and harvesting costs.

These structural differences in the farms' input utilization and resource endowments define their strategies in coping with possible changes in the seasonal farm labor market conditions. Since both farms employ seasonal workers (to different extents), they realize the need to offer more competitive wages to attract workers, although the organic farmer confided that there is more than just wages in the hiring problem, including dealing with finding skilled, productive, and efficient workers, and dealing with workers' work attitudes ("laziness"). The less mechanized farm will examine its own financial resources and explore the feasibility of investing in more mechanized operations to reduce dependence on labor. The other farm will continue to hire seasonal workers and will consider the government's H2A farm worker visa program that allows farm businesses to apply for work permits so foreign workers can enter the country with valid work permits. This producer, however, is aware that the H2A program is not usually the "easy way out" of this predicament. The program has stringent requirements for application, and when in place, would require the farm employers to set up boarding facilities, offer competitive wages, and provide transportation and other benefits to their foreign workers.

The Peanut and Soybean Farms

The conventional farmer is a third generation farmer who has been farming for 28 years. Row crops, including cotton, peanuts, soybeans, and corn are his primary products. He farms about 1,000 acres, of which 550 are owned and the rest are rented. He currently has 98 acres planted to peanuts and 32 acres to soybeans. The soybeans were planted by conservation tillage behind a wheat crop while portions of the peanut crop were planted by conventional tillage and the rest by conservation tillage. The owner is a full-time farmer, with two family members available to work on the farm when needed and available. He has two full-time year-round helpers and one part-time seasonal helper. His crop operations are heavily mechanized. Seventy percent of his harvesting costs is accounted for by equipment costs while labor wages only account for 20 percent of total costs.

The organic peanut and soybean farm is a much smaller scale. This farm currently has 50 certified organic acres, 17 acres in transition, and 50 acres that are being leased to a neighbor who is certified organic. Organic peanut acres are usually anywhere from three to five acres since the farm started growing peanuts in 2006. There are also typically 20 to 50 acres of soybeans grown in the farm since 2006. The owner is the only family member working on the farm and spends a minimum of 50 hours a week on farm work. The farm has four to five full-time employees and about six part-time workers that help with handpicking and grading produce during the harvest season. Most farm operations are labor-intensive as the farm's business size does not warrant investments in mechanized operations. As long as the peanut and soybean operations remain small and manageable, the labor hiring problem will be confined to finding "motivated" efficient workers. However, should the farm contemplate business expansion, the need to shift to less labor-intensive production methods will become more relevant and necessary.

Enterprise Budget Analysis

The MALTAG enterprise budget for organic bell pepper production is used for this analysis. The budget provides information on direct and fixed costs for an acre production of bell pepper. Table 6 presents a detailed breakdown of these costs that include material inputs, equipment, labor (including man-hour requirements for each operation), and overhead costs.

The results of this analysis are summarized in three plots (Figures 1 to 3) that provide interesting trends on the resulting farm returns and margins under different farm labor hiring scenarios. Figure 1 presents the effect of decreasing the involvement of family members in farm work and the subsequent increase in hiring unskilled workers. In this analysis, family members are assumed to be working an average of eight hours per week on an acre of bell pepper plantation. This figure is based on the 2004 survey results from the Organic Farming Research Foundation's (OFRF) National Organic Farmers Survey that reported 67 percent of organic farmers working on the farm full-time. Assuming an average organic farm size of five acres, the farmer is expected to work eight hours on every acre of organic production. In Figure 1, the base family labor employment rate of eight hours per acre (over a 13-week production period) is gradually reduced by 10 percent in each observation point. As family labor is decreased, the hiring of unskilled labor increases to fill in the employment requirement gap. As can be gleaned in Figure 1, the replacement of family farm labor hours with non-family unskilled labor hours results

in increasing net dollar returns per family labor hour invested in the farm business. However, such arrangement produces a declining trend in the resulting net profit margins, i.e., the squeezing of net profit margins when more unskilled farm labor hours are relied on.

Figure 2 presents the other case of increasing family farm labor hours. These scenarios come close to capturing the predicament of small organic producers. When unskilled farm labor is hard to find, the farmer and his household have no choice but to increase their working hours on the farm. The results of such coping strategy are decreasing dollar returns and increasing net profit margins. However, these trends are realized under the assumption that there are no gaps between the labor demand and actual employment times. In other words, there is an adequate number of family members who can quickly and promptly fill in the employment gap when necessary.

Figure 3 adds a more realistic assumption to the small organic farmer's predicament. When the involvement of household members is already maximized and domestic unskilled workers are unable to fill in the employment gap, the farm business (as established in the case studies) actually incurs some production losses as delays in harvesting could lead to over ripening and rotting of the produce to be harvested. It can be gleaned in figure 3 that when such hiring problem is encountered and the farm incurs yield losses, net profit margins drop significantly. In this analysis, the farm business starts to incur net losses when yields are reduced by more than 40 percent.

Summary and Conclusions

This study has presented evidences on how organic and conventional farms cope with changes in the farm labor market when the seasonal foreign workers with illegal resident status have left the country. The survey conducted among organic and conventional farm operators in the Southeast indicate that most farms, regardless of type of farm operations, experienced difficulty in hiring workers, with the severity of the problem ranging from periodic ("sometimes") to constant ("always") frequencies.

The survey participants' preferences for specific business strategies for coping with expected changes in the farm labor market provide interesting implications that can be associated with certain structural differences between organic and conventional farms. The most popular business strategy for conventional farms considers an input substitution scheme where more machinery will be acquired to reduce labor requirements in the event of a farm labor hiring (or shortage)

problem. This perhaps reflects the conventional farms' more mechanized (machine-dependent) existing operations that made them more familiar with this strategy.

Downsizing of farm operations is the second most popular strategy for conventional farms. This is a logical result considering conventional farmers usually operate much larger operations (*vis-à-vis* their organic counterparts). Production diversification is the most popular strategy for organic farms. Organic farms are structurally more diversified as their farms are usually planted to various types of fruits and vegetables. The need for regular crop rotation practices to enhance soil productivity expose these farmers to various production (or crop choice) options. Both organic and conventional farms also consider relying on family members to increase their participation in the farm business when extra help from non-family workers cannot be obtained.

The case studies also produced certain recurring themes. The hiring of "motivated" labor is common to both conventional and organic farms. More mechanized or capital-intensive farms (usually

conventional farms) are less stressed in dealing with farm labor hiring issues. Family labor has always been the source of reliable farm workers. "Motivated" labor can only be lured into farm employment by offering highly competitive compensation packages, which will erode farm profits. Thus, both conventional and organic farms are vulnerable in the face of the shortage of "motivated" labor willing to do difficult farm work. Vulnerability, however, depends on the capability to either enhance capital intensiveness or minimize labor intensiveness of farm operations and the financial and economic flexibility to sacrifice erosion of profits to offer more attraction compensation packages.

The enterprise budget analysis has shown that substituting family and non-family (unskilled) labor hours will result in changes in net dollar returns and net profit margins when there are no gaps in the labor substitutions. However, when the household members' involvement in farm work has reached its limit and domestic unskilled farm workers are unable to quickly fill in the employment void, the farm's production yields could be adversely affected and could result in business losses when the yields drop significantly.

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Figure 1. Decreasing family farm labor hours

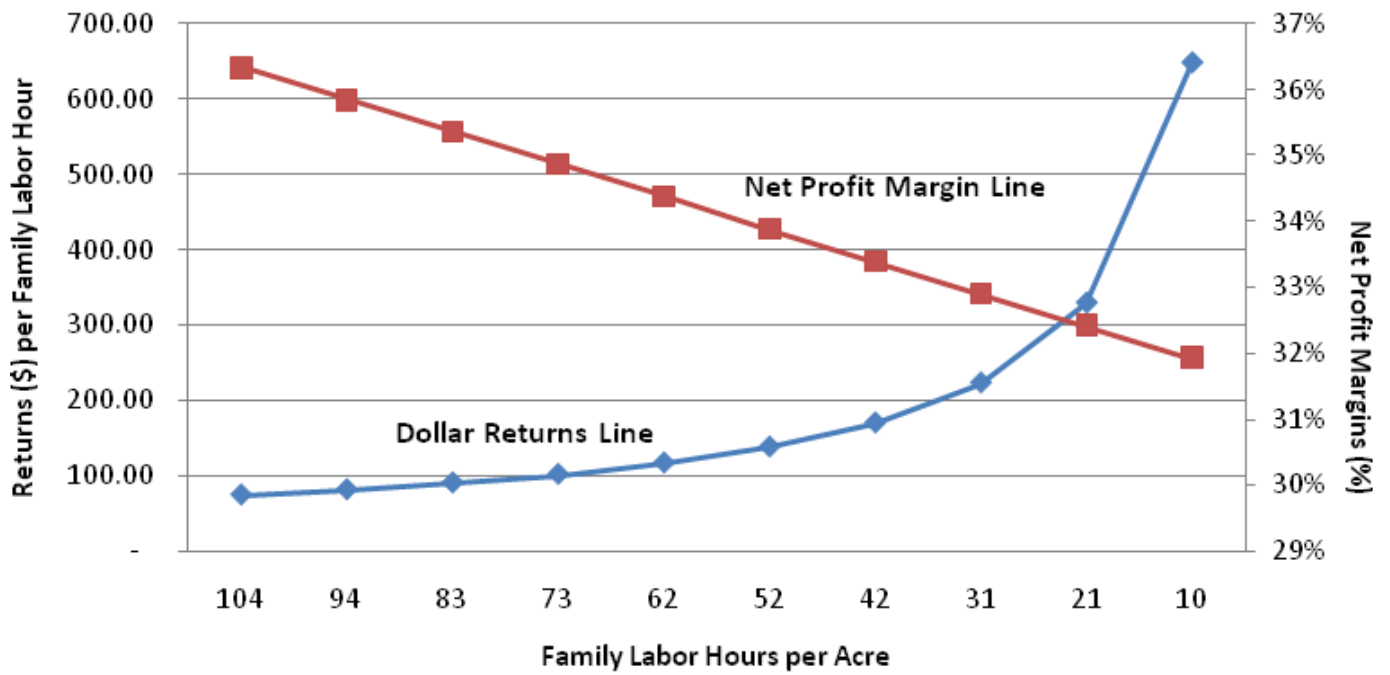


Figure 2. Increasing family farm labor hours

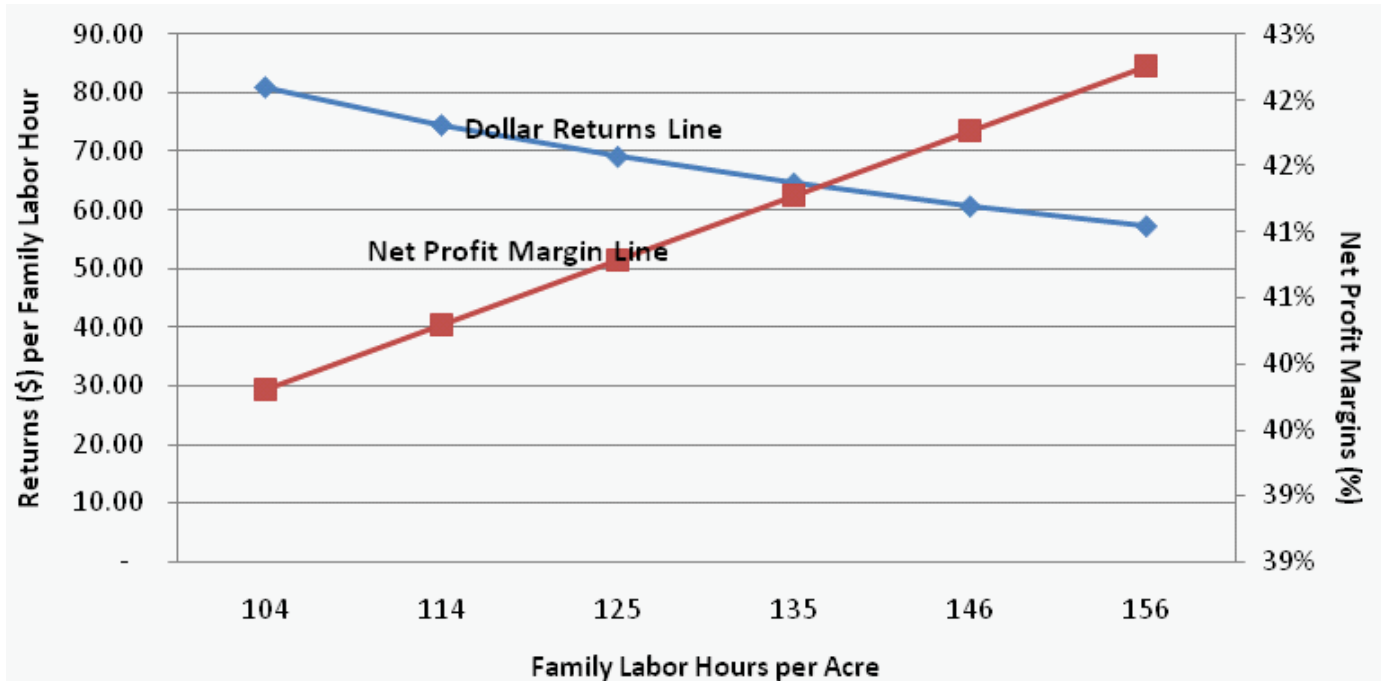


Figure 3. Yield and profit margin effects of fully utilized family labor

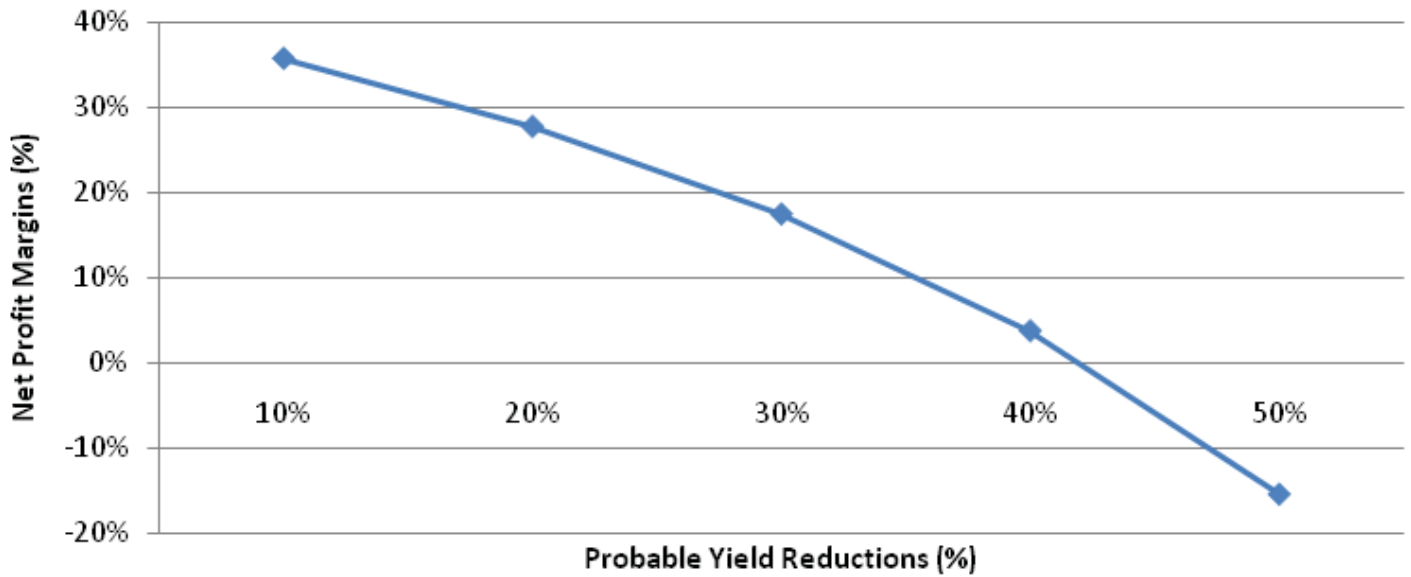


Table 1. Demographic and structural characteristics of survey respondents

Farming System	Farming Experience (Years)	Educational Attainment (Refer to categories below)	Age (Years)	Gender		Farming Commitment	
				Male	Female	Full-Time	Part-Time
Conventional Farms				32	8	23	18
Mean	20.18	4.49	53.28				
Standard Deviation	15.35	2.98	15.17				
Minimum	2	1	16				
Maximum	65	20	82				
Organic Farms				20	23	25	18
Mean	13.79	4.70	48.35				
Standard Deviation	11.18	1.73	12.02				
Minimum	2	2	26				
Maximum	50	7	78				

Table 2. Respondents' past hiring experiences: level of difficulty in hiring non-family farm workers, by farm type

Question: "Based on your experiences during the past several years, did you usually experience any difficulty in finding non-family (seasonal) farm workers to hire whenever you needed them?"								
Responses	Conventional Farms			Organic Farms			Total	
	Number	% of All	% of Farm Category	Number	% of All	% of Farm Category	Number	% of All
<i>Never</i>	10	13.70	27.78	12	16.44	32.43	22	30.14
<i>Sometimes</i>	12	16.44	33.33	11	15.07	29.73	23	31.51
<i>Most of the time</i>	8	10.96	22.22	6	8.22	16.22	14	19.18
<i>Always</i>	4	5.48	11.11	8	10.96	21.62	12	16.44
<i>No Answer</i>	2	2.74	5.56	0	0.00	0.00	3	2.74
Total	36	49.32	100.00	37	50.69	100.00	73	100.00

Table 3. Respondents' expectations on effects of immigration policies on farm labor supply

Question: "Do you expect the new immigration policies will affect the farm workers' supply in your area?"								
Responses	Conventional Farms			Organic Farms			Total	
	Number	% of All	% of Farm Category	Number	% of All	% of Farm Category	Number	% of All
<i>Yes, significantly</i>	15	18.07	37.50	12	14.46	27.91	27	32.53
<i>Yes, but only slightly</i>	5	6.02	12.50	7	8.43	16.28	12	14.46
<i>Not at all</i>	8	9.64	20.00	7	8.43	16.28	15	18.07
<i>I don't know</i>	12	14.46	30.00	17	20.48	39.53	29	34.94
Total	40	48.19	100.00	43	51.81	100.00	83	100.00

Table 4. Respondents' coping strategies for an immigration policy-fueled labor shortage

Question: "How are you going to deal with a shortage of workers as a result of stricter implementation of immigration policies?" (Respondents can choose more than one strategy.)								
Responses	Conventional Farms			Organic Farms			Total	
	Number	% of All	% (Farm Category)	Number	% of All	% (Farm Category)	Number	% of All
<i>Reduce off-farm working time and work more in the farm</i>	4	2.42	5.71	11	6.67	11.58	15	9.09
<i>Quit my off-farm work and spend more time in the farm</i>	0	0	0	0	0	0	0	0
<i>Rely more on family members to devote more time to farm work</i>	11	6.67	15.71	13	7.88	13.68	24	14.55
<i>Offer higher wages to attract some available non-family farm workers for hire</i>	8	4.85	11.43	10	6.06	10.53	18	10.91
<i>Offer other worker fringe benefits to attract some available non-family farm workers for hire</i>	1	0.61	1.43	2	1.21	2.11	3	1.82
<i>Downsizing (i.e. continue farming at smaller scale and/or size)</i>	12	7.27	17.14	13	7.88	13.68	25	15.15
<i>Change production plans to involve commodities that require less labor</i>	6	3.64	8.57	15	9.09	15.79	21	12.73
<i>Invest in more machineries to reduce the need for more labor inputs</i>	13	7.88	18.57	9	5.45	9.47	22	13.33
<i>Consider other farming methods that do not rely much on labor</i>	10	6.06	14.29	14	8.48	14.74	24	14.55
<i>Others</i>	5	3.03	7.14	8	4.85	8.42	13	7.88
Total Frequency	70	42.42	100.00	95	57.58	100.00	165	100.00

Table 5. Blueberry case farms' breakdown of costs, percentage of total costs

Farm Operation	Labor		Materials		Machinery	
	Organic	Conventional	Organic	Conventional	Organic	Conventional
Pre-Planting	80	20	0	0	20	80
Planting	40	20	40	20	20	60
Processing	40	20	30	0	30	80
Harvesting	90	20	0	0	10	80
Marketing	100	100	0	0	0	0

Table 6. Organic bell pepper enterprise budget, irrigate, one acre, Georgia

ITEM	UNIT	PRICE (\$)	QUANTITY	AMOUNT (\$)
DIRECT EXPENSES				
CUSTOM, Contract Plant Bell Pepper	1000pl	13.75	17.0000	233.75
FERTILIZER				
Lime (Spread)	ton	40.00	0.3300	13.20
Chicken Litter	ton	9.33	2.0000	18.66
Liquid Fish Fertilizer	gal	15.61	190.0000	2,965.90
FUNGICIDE				
Kocide DF	lb	3.42	6.0000	20.52
Neem Oil	pt	5.27	3.0000	15.81
INSECTICIDE				
Dipel ES	pt	4.04	1.0000	4.04
Azatin EC	oz	5.21	14.0000	72.94
Pyrethrins	oz	3.12	16.0000	49.92
SEED/PLANTS				
Pepper Plants – Organic	100plt	7.77	170.0000	1,320.90
S. Peas – Organic	lb	33.00	33.0000	1,089.00
OTHER				
Plastic Mulch	roll	162.00	1.8000	291.60
Wood Stakes	100	15.00	36.0000	540.00
Plastic string	6000ft	8.00	12.0000	96.00
Harvest Labor – Pepper	bu	0.70	1,800.0000	1,260.00
15g tub Bell Pepper	each	7.50	30.0000	225.00
Bin vegetable	each	75.00	8.0000	600.00
Boxes – waxed	each	1.32	1800.0000	2,376.00

Table 6. (cont'd.) Organic bell pepper enterprise budget, irrigate, one acre, Georgia

IRRIGATION SUPPLIES				
Drip Tape	roll	156.00	1.2000	187.20
Rural Water	Ac-in	75.01	6.0000	450.06
OPERATOR LABOR	hour	10.21	8.3940	85.72
GRADE AND PACK LABOR	hour	8.28	80.0000	662.40
HAND LABOR	hour	8.28	48.0000	397.44
FERTIGATION LABOR	hour	8.28	25.0000	207.00
UNALLOCATED LABOR	hour	10.20	1.6788	17.14
DIESEL FUEL	gal	2.33	32.4042	75.49
REPAIRS AND MAINTENANCE	acre	62.46	1.0000	62.46
INTEREST ON OPTG CAPITAL	acre	318.99	1.0000	318.99
FIXED EXPENSES	acre	655.36	1.0000	655.36
TOTAL EXPENSES				14,312.50

Source: MALTAG, 2008