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Discerning Differences among Producer Groups and Organic Adoption Barriers in Texas

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While nationwide growth in the production of organic agricultural products has seen rapid expansion, the number of certified organic operations in Texas has remained relatively stagnant. Evidence shows a shift in consumer's demands toward organic products, yet Texas producers have been comparatively slow to respond to this shift. A survey was distributed to a random sample of 4,006 Texas producers as a means of understanding the perceived barriers of adoption of organic production practices in Texas,. Emphasis was placed on perceived production and market barriers to organic production and differences in perceived barriers among producer groups. The results provide guidance about the types of policy approaches that will be effective in overcoming the barriers to organic adoption.

Organic farming is one of the fastest growing segments of U.S. agriculture (Dimitri and Greene 2002). In recent years the organic food sector has experienced double-digit growth ranging between 17 percent and 20 percent annually, while the conventional food industry has experienced a much more moderate two percent to three percent growth (USDA/ERS 2007; OTA 2006). The amount of certified organic cropland doubled between 1990 and 2002 and then doubled again by 2005. The organic livestock sector grew even faster than the crop sector (USDA/ERS 2007). Following the trend in production, the U.S. organic market more than doubled from 2000 to 2006. Sales of organic food increased from $5.5 billion in 1998 to almost $14 billion in 2005 (DataMonitor 2007).

Consumer demand is the major driving force for organic production. Thompson (1998), Lohr (1998) and Casellas, Berges, and Daniela (2006) indicate consumers' food tastes are changing. Consumers are demanding product attributes that include safety, convenience, quality, and attributes such as environmental quality, animal welfare, or lack of genetic modifications. Organic food consumers want to feel confident that they are buying food that not only was grown organically but also maintained its organic integrity at each stage in its journey to the market (Dimitri and Greene 2002). The results of a 2003 study conducted in Vermont show evidence that young people with higher income, smaller household size, and fewer children were willing to pay more for organic food (Wang and Sun 2003). Conner (2004) found a connection between the high prices paid for organics and consumers' belief in the superiority of organic foods and their ability to deliver health benefits.

The creation of national organic standards in 2002 supported the growth of the market by providing customers accurately identified organic products. Agribusiness has changed its practices to meet the demand. As the organic industry has become more mainstream, larger farms and ranches have reduced their costs by streamlining their operations. Organic prices are dropping as production, which will likely continue to expand (DataMonitor 2007), increases to meet demand. Production in the United States is still lagging behind demand.

Distribution channels are becoming another major factor influencing organic production. In 2000, more organic food was purchased in conventional supermarkets than in any other venue. Organic products are now available in nearly 20,000 natural foods stores and are sold in 73 percent of all conventional grocery stores (Dimitri and Greene 2002). In recent years the conventional supermarkets have continued to rapidly increase their share of organic sales (OTA 2006). The burgeoning consumer interest in organically grown foods has opened new market opportunities for producers and is leading to a transformation in the organic food industry.

In this scenario, significant entry into the market is expected. However, many producers in the marketplace point to a variety of constraints—such

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as, in the case of livestock producers, the lack of organically grown feed—when adopting organic practices. Many conventional producers are not willing to venture into the world of organics, even though organically certified beef cattle can bring several dollars more per hundredweight than conventionally raised cattle.

Dimitri and Greene (2002) state that as consumer interest continues to gather momentum, many involved in the supply chain are specializing in growing, processing, and marketing an ever-widening array of organic products. However, according to Greene and Kremen (2003) and Kuminoff and Wossink (2005), organic production involves a higher degree of yield risk than does conventional production. The adoption of organic methods takes a period of several years to take full effect, which can lead to an increased risk of damage to crops from pests or weeds in the early years of organic production.

Even with growth in demand, several factors must be considered before adopting organic production. Previous survey research has shown that farmers perceive the uncertainty of the conversion to organic as a major obstacle (Padel 2001). According to Dimitri and Greene (2002), the damage incurred by organic products prior to processing or retail sale is a form of yield risk faced by organic producers. Even though organic producers face risks associated with organic yields, organic producers have not, prior to the 2008 Farm Bill, had access to crop insurance or other federally funded assistance programs (Volpe 2006). As stated by Lohr (1998), key financial constraints are the lack of access to premium prices until conversion is complete, conversion-related investments and disinvestments, and information-gathering costs for production and marketing. While some other countries provide incentives for organic transition, including programs to subsidize the lower yields during the transition period, up until the 2008 Farm Bill there were no such programs offered in the United States (Guthman 2004; Michelsen 2001).

Based on figures provided by Texas Department of Agriculture's organic certification program, as well as by USDA, the number of certified organic operations in Texas has remained relatively stagnant, fluctuating from year to year but not expanding nearly as rapidly as the demand for organic products, specifically food. California, the leading U.S. state in terms of organic producers, experienced a 125 percent increase in organic producers between 2000 and 2007, while Texas experienced a 36 percent increase (amounting to 58 additional producers) during the same eight-year period. There seems to be a discrepancy between the market's capacity for new producers, which given the rapid growth would appear large, and the escalation in the actual number of new growers in Texas, which is relatively small.

USDA data reveals that the big increase in total certified organic acres in crops and pastureland and number of operations in Texas occurred from 1997 to 2002. The rate of increase in certified livestock was higher during the 2002–2005 period. There is wide variation across commodities. Some commodities decreased in total certified organic acres (oilseeds and cotton), several increased moderately (grains, beans, fruit, and peanuts), and some increasing substantially (livestock, hay/silage, and vegetables). In 2005, Texas ranked sixth in total organic cropland acres (87,124 acres) and second in organic pasture acres (241,353 acres) (USDA/ERS 2007). However, there seems to be a gap between the apparent demand for organic products and the willingness of producers to adopt organic practices in Texas.

Conceptual Framework

Theory associated with technology adoption in agriculture suggests that individuals move through a series of stages, beginning with awareness and interest, prior to adopting a new agricultural practice (Bohlen and Beal 1981) with the diffusion of technology generally taking on an S-shaped curve. However, this same pattern has been difficult to apply to sustainable agricultural practices, such as organic production. Hypotheses for this discontinuity include that sustainable agricultural practices are adopted for reasons vastly different than commercial innovations and that organic farming is not a typical agricultural innovation (Gillespie 2001). Awareness, or the "awareness effect," was later identified by D'Souza, Cyphers, and Phipps (1993) as being a key aspect of the adoption of sustainable agricultural practices. Pannell (2003) suggests that the adoption process for sustainable agricultural practices occurs through obtaining and evaluating information, slowly reducing the uncer-

tainty associated with the new practice. As more information is obtained, the barriers to adoption are broken down.

Specific barriers to entry have been suggested in prior research on the adoption of organic production practices. Barriers include high costs of production, uncertainties about organic market stability, losses during transitional periods, lack of information, and limited access to credit and financing (Strochlic and Sierra 2007). Surveys conducted by the Organic Farming Research Foundation found that barriers to information were the most significant in their expansion of organic practices, in addition to supply-related constraints (Walz 2004; Wheeler 2007). In terms of those most likely to bypass these barriers, prior research on the adoption of organic production practices by horticulturalists in the UK has shown that demographics including gender and age have a role in the adoption proclivity, with younger and female producers being more likely to adopt (Burton, Rigby, and Young 1999). Although prior research has addressed barriers to entry into the general organic markets, specific attention to groups not matching current adoption rates have not been directly identified (in this case, Texas producers). In addition, the organic-adoption literature has paid little attention to distinguishing differences in adoption barriers among producer groups.

Objectives

This research identifies perceived barriers to entry to understand why individual producer groups in Texas are not adopting organic production at a higher rate. It is well known that there are vast differences in production practices among agricultural commodities, yet prior research has treated producers as a homogeneous group. The primary objective of this research is to determine differences in production and marketing barriers among different producer groups with the intent to isolate key distinctions.

The secondary objective of this research is to determine policy objectives to target specific producer groups. Policies which have the potential to assist in increasing organic production in Texas will be explored based upon the perceived barriers to entry. Research has shown that demand is increasing at a rate that outpaces supply. Specific policy recommendations based on research are needed to determine future organic production in Texas.

Methodology

Texas producers were identified through a database of producers from the USDA National Agricultural Statistics Service (NASS). Texas producers were categorized based upon farm value in sales, narrowing the scope of the survey to producers reporting farm sales above $25,000. Texas producers meeting the farm-sales requirement were grouped based upon their reported primary commodity and then a disproportionate stratified sample was drawn. The survey was distributed via postal mail to the random sample of 4,006 producers (approximately six percent of Texas producers meeting the sales requirement).

A second and third mailing were used to increase the response rate. The total number of surveys returned was 1,178, with 977 of those surveys being sufficiently completed. Although not necessarily "good," the response rate ultimately achieved was fairly typical for the group being surveyed and the format of the survey, and followed initial expectations (Pennings, Irwin, and Good 1999; Yammarino, Skinner, and Childers 1999). Additionally, within each producer group response rates were considered to be satisfactory.

The data were descriptively summarized using frequencies, percentages, means, and cross-tabulation statistics. In addition, a one-way Analysis of Variance (ANOVA) test was used to determine statistical differences among producer groups for various questions. Our hypothesis was that each producer group would have different perceptions for various barriers, and testing that hypothesis was critical for determining policy objectives to meet the needs for each producer group.

Results

Demographic Summary Statistics

The survey was designed so producers could select multiple producer categories with which they identified. Thirty-seven percent report that they produce multiple crops. The most prevalent combination for multiple crop producers is a combination of beef and row crops. Beef cattle producers had the largest single response, 21 percent, with row crop producers being second, 12 percent. Swine producers had the lowest response, representing only one

percent of the sample. The breakdown of other respondents is as follows: vegetable/nut production, eight percent; dairy products, seven percent; sheep/goat, five percent; poultry/eggs, four percent; and greenhouse/floriculture, four percent.

The second question asked producers about their current production practices. Conventional farmers made up 89 percent of the respondents. There are no producers who were previously certified but no longer producing organically. Approximately two percent of producers are conventional producers and in the process of being certified. Certified organic producers made up one percent of the survey respondents, while eight percent of producers are currently practicing organic production but are not certified. The results of a cross-tabulation analysis show most non-certified organic producers are cattle producers, vegetable/fruit producers, and producers of multiple crops.

Producers were asked how long they had been farming; 65 percent of the producers have been in business for over twenty years. Producers who have been in business for less than five years represent five percent of the sample, ten percent have been in business between five to ten years, and 20 percent from ten to twenty years. This is consistent with current agricultural producer demographics in Texas. Cross-tabulation results for production practices versus number of years in operation and between producers and years in operation show that a greater percentage of producers in the twenty-years-and-over category (56 percent) are practicing non-certified organic farming relative to producers in operation less than five years (ten percent).

A majority of farmers, 49 percent, market less than $50,000 annually in gross sales. Only 12 percent of all producers market over $500,000 annual gross sales. A cross-tabulation analysis shows a majority of the producers over $500,000 in annual gross revenue are row crop and diary producers. A large percentage of green house/floriculture producers are over $500,000 in annual sales. The results show most vegetable/fruit/nut, swine, poultry, and sheep/goat producers are small in size.

Producers were asked to select multiple categories that best fit their expectations for the future of their operation. Approximately 52 percent of producers do not expect to make any changes in the near future, while 21 percent are expecting to expand production and 12 percent are expecting to decrease production. Seven percent of producers are expecting to close operations in the next three years. Almost all respondents who chose multiple production categories included "becoming more diverse" as a selection. Cross-tabulations show beef producers are most likely to decrease in size or close. Dairy producers are most likely to expand in size.

When asked about interest in organic production, 54 percent of all producers are not interested, 18 percent are slightly interested in organic production, 19 percent are moderately interested, and nine percent are highly interested in adopting organic production practices. Identification of producer groups that interested in organic production will be helpful to determine direction of future policy efforts. Producers who answered "No Interest" or "Slight Interest" are grouped together as "No Interest." Producers who answered "Moderate Interest" and "High Interest" are grouped together as "High Interest." No Interest producers made up 73 percent of the respondents, with the other 27 percent falling into the High Interest category for organic production. Cross-tabulation was conducted between producer groups and interest in organic production. Row crop and beef producers are the least interested in organic production, with 83 percent and 81 percent, respectively, expressing no interest in organic production. Vegetable/fruit and greenhouse/floriculture producers express the most interest in organic production, with 40 percent and 36 percent, respectively, expressing a relatively high interest in organic production.

Marketing and Production Barriers

Various questions regarding marketing and production barriers to organic production are summarized below. These questions were presented in the survey using a scale based on the Likert Ranking Scale. Results are first summarized for the overall sample and then broken down to compare rankings across producer groups.

Producers were asked to determine the main adoption barriers to organic production via two separate questions, one pertaining to marketing conditions and the other to production conditions. Producers were given the following ranking choices: 1 = "Not a barrier" (no issue to entering organic markets), 2 = "Moderate barrier" (some

level of barrier for entry to organic markets), and 3 = "Severe barrier" (a definite barrier to entry). Figure 1 presents the ranking results for marketing conditions. As the figure indicates, producers rank all marketing categories as moderate barriers to organic adoption, with average scores between 2.02 for finding reliable buyers/markets and 2.15 for distance to available markets. The frequencies are fairly consistent among rankings, indicating there is little perceived difference among marketing barriers. "Distance to available markets" does stand out, as 43 percent of respondents report it as a severe barrier to organic adoption and t-tests indicate that this barrier is statistically different (at an alpha of 0.05) from finding reliable buyers and the ability to obtain organic price information as barriers.

Production-barrier rankings are presented in Figure 2. The results are similar to the marketing barriers as, on average, producers rank all the barriers as being fairly moderate. Organic processing facilities appear to be the biggest perceived production barrier with an average score of 2.28. Based on average score, all other production barriers are seen as moderate (production barrier average rankings were between 2.02 for fertility related production losses and 2.21for high input costs). Using a two-sample t-test at an alpha of 0.05 it can be shown that there are statistical differences between the barrier of high input costs and weather-related production losses, fertility related production losses, and an understanding of organic production as production barriers. The frequency distributions show more producers rank "availability of organic processing facilities," "pest-related production loss," and "high input costs" as severe barriers, while "fertility related production loss" was not seen as a barrier to organic production by the largest percentage of producers.

In order to assess the missing link in the existing structure, an additional question asked producers to determine which services and/or information are important to promote organic adoption from producers. The value rankings are: 1 = "Not useful," 2 = "Somewhat useful," and 3 = "Very useful." Figure 3 shows the results from the survey. A great deal of focus has placed on market development for organics, but these results suggest that development of markets may not be the only useful approach to

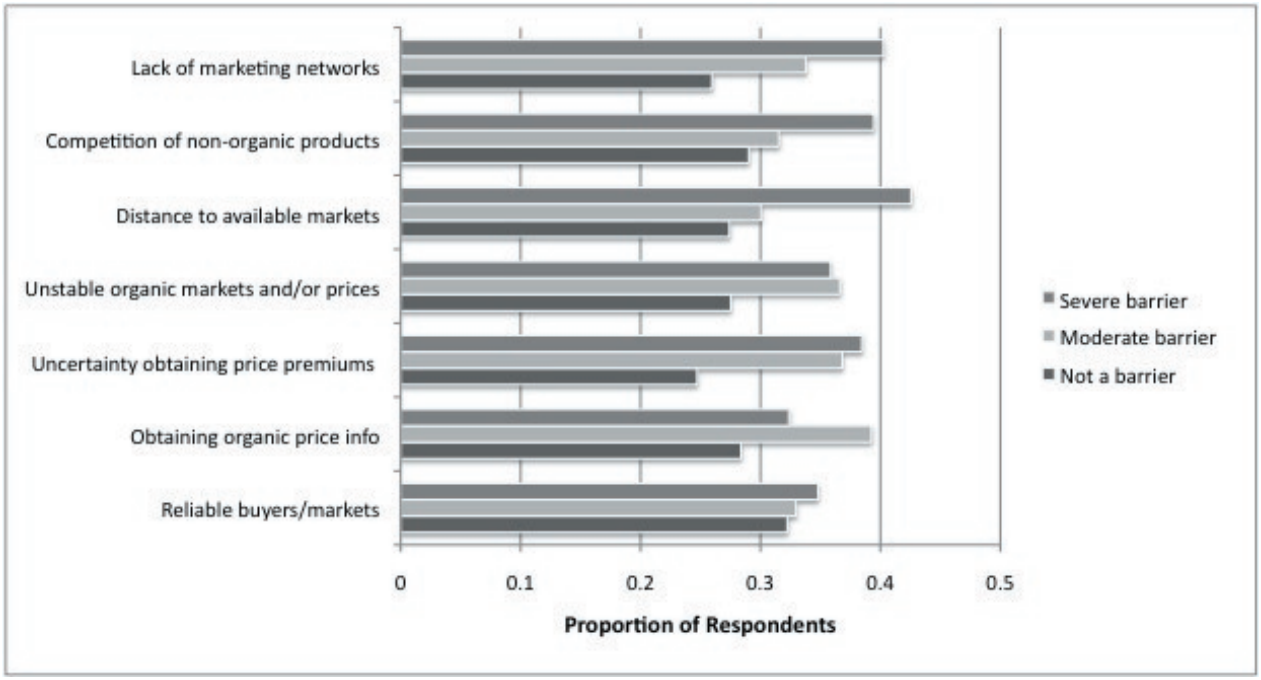

Figure 1. Marketing Condition Adoption Barriers by Proportion of Respondents.

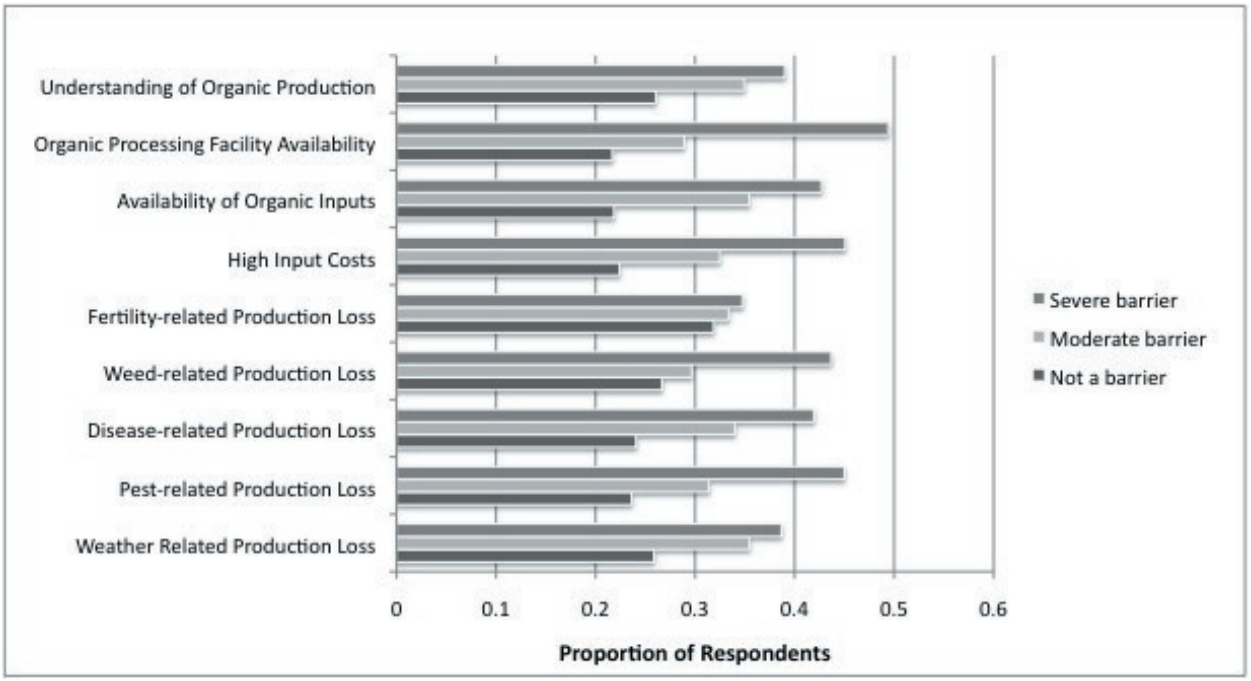

Figure 2. Production Condition Adoption Barriers by Proportion of Respondents.

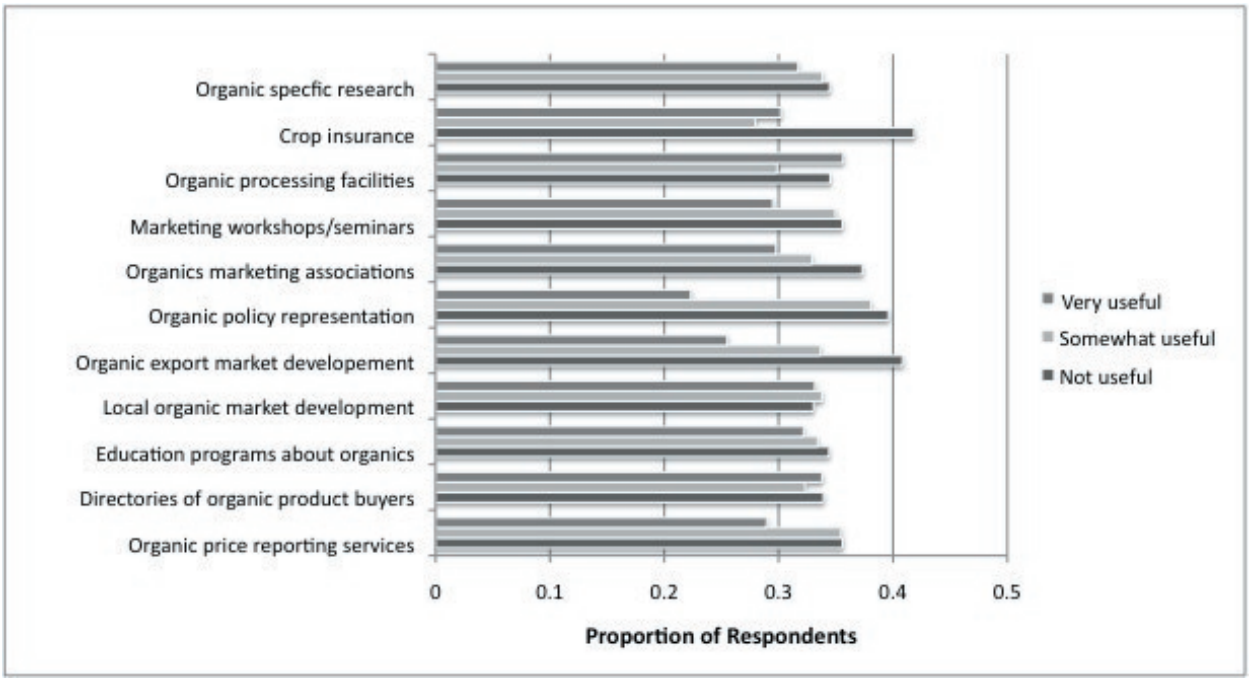

Figure 3. Organic Information/Services by Percentage of Respondents.

stimulating growth in the organic industry within Texas. "Organic processing facilities" ranked the highest among all choices, with an average score of 2.06, indicating that the majority of producers believe the addition of organic processing facilities to be very useful and an aid in their decision to adopt organic practices. However, the usefulness of organic processing facilities also has the largest variation among respondents (standard deviation of 1.4, relative to an average standard deviation of 0.81 for the ten other alternatives). This variability is a likely indicator of the diverse needs of different types of producers and will be explored further in later sections of this paper. Further analysis shows that there is no statistical difference between the availability of organic processing facilities and other highly ranked information services (including directories of organic product buyers, educational programs, and local organic market development)." "Representation on organics-related public policy issues," "organic export/market development," and "crop insurance" are ranked the lowest among the choices, with average scores of 1.82, 1.84, and 1.88, respectively.

Analysis by Producer Group

One of the distinctive factors of survey research done in the past is that producers were treated as a heterogeneous group. By identifying individual characteristics of producer "types," a deeper understanding of the barriers to organic adoption can be obtained. Producers in this study were categorized into nine production subgroups. As a means of initially summarizing the findings by producer group, Table 1 shows the marketing and production barriers and the information services identified by each producer group as having the most impact on their decision to adopt organic practices. The average scores given by a producer group to the marketing barriers identified in Table 1 were statistically different from the collective average score given to the other marketing barriers.

It is fruitful to analyze group-level statistics for information that cannot be gleaned from the summary statistics. To determine if there are significant differences among producer groups, a one-way ANOVA was used for scaled items. All significance at the $p = 0.05$ level was reported. These differences assisted in the development of the policy recommendations in this report. Table 2 represents *p*-values for significance between producer groups and marketing/production barriers. There is statistical significance between each producer group for marketing barriers except for "unstable organic markets and/or prices." Further analysis shows that for almost all barriers, swine producers have the highest mean ranking, indicating marketing barriers are largely considered a severe barrier by swine producers. Greenhouse/floriculture producers saw "competition with 'non-organic' products" as a severe barrier to marketing organic products.

Swine producers have the most disparate opinions on marketing barriers, statistically differing from the average 86 percent of the time, and, in general, ranking the marketing barriers higher than do other types of producers. On the other end of the spectrum, dairy producers tend to view fewer of the barriers as being substantial barriers and view reliable buyers, organic price information, distance to markets, and lack of marketing networks as less of a barrier than do other producer groups. Overall, organic price premiums and the distance to markets were the most substantial marketing barriers, with swine producers and multiple-commodity producers feeling the largest impact fro those marketing barriers.

With respect to production barriers, the results show there are fewer significant differences between producer groups. "Pest-related production losses," "weed-related production losses," and "availability of organic processing facilities" are the three production barriers statistically significant among producer groups. These results are consistent with the idea that crop producers would likely find pest- and weed-related production losses more important than would livestock producers. Similarly, livestock producers find processing facilities for harvesting more important than do crop producers, as the availability of facilities is limited. Additional analysis shows that row crop producers rank weed- and pest-related production losses as severe barriers and swine producers rank processing facilities as a severe barrier.

The ANOVA analysis for producers versus organic information sources is in Table 3. There are numerous statistical differences between groups. "Organic price-reporting services," "directories of organic product buyers," "consumer education programs about organics," "local/regional

Table 1. Barriers and Services Identified as Having the Most Impact on Organic Adoption by Producer Group.

	Barrier / service	Row crop	Beef prod	Dairy prod	Veg/nut prod	Swine prod	Greenhouse/ floriculture	Poultry/ eggs	Sheep/ goats	Multiple
Marketing barriers	Reliable buyers/markets									
	Organic price information									
	Organic price premiums									
	Unstable organic markets			X						
	Distance to available markets	X	X					X		X
	Competition of "non-organics"						X		X	
	Lack of marketing networks				X		X			
Production barriers	Weather- related loss									
	Pest-related loss	X			X					
	Disease-related loss				X					
	Weed-related loss	X								
	Fertility-related loss									
	High inputs costs			X			X			
	Availability of organic inputs			X			X			
	Organic processing facilities		X			X		X	X	X
	Lack of understanding							X		
Information services					X					
	Price reporting services									
	Organic buyers	X	X		X	X	X		X	
	Education programs	X	X	X		X				
	Local market development	X	X			X			X	
	Export developement									
	Public policy representation									
	Co-ops/ associations						X			
	Workshops/ seminars									
	Processing facilities		X		X		X	X	X	
	Crop insurance	X								
	Research/ extension	X			X			X		

Table 2. ANOVA Comparison of Producer Types and Marketing/Production Barriers.

Marketing barriers	*Significance (p < 0.05)*
Finding reliable buyers/markets	0.003*
Difficulty obtaining organic price information	0.005*
Uncertainty in obtaining organic price premiums	0.010*
Unstable organic markets and/or prices	0.192
Distance to available organic markets	0.001*
Competition with "non-organic" products	0.005*
Lack of organic marketing networks	0.003*
Production barriers	
Weather- related production loss	0.078
Pest-related production loss	0.006*
Disease-related production loss	0.095
Weed-related production loss	0.000*
Fertility-related production loss	0.054
High input costs	0.064
Availability of organic inputs (e.g., feed, fertilizer)	0.171
Availability of organic processing facilities	0.037*
Lack of understanding regarding organic production methods	0.370

* Denotes statistical significance $p < 0.05$.

Table 3. ANOVA Comparison of Producers and Information Services.

Information services	*Significance (p < 0.05)*
Organic price-reporting services	0.007*
Directories of organic product buyers	0.002*
Consumer education programs about organics	0.013*
Local/regional organic market development	0.001*
Organic export programs/market development	0.072
Representation on organics-related public policy issues	0.253
Organics marketing co-ops/associations	0.058
Organic marketing workshops/seminars	0.005*
Organic processing facilities	0.000*
Crop insurance for organically grown products	0.000*
Organic-specific research/extension	0.001*

* Denotes statistical significance $p < 0.05$.

organic market development," "organic marketing workshops/seminars," "organic processing facilities," "crop insurance for organically grown products," and "organic-specific research/extension" are all significantly different among producer groups at the 95 percent or greater confidence level.

Further analysis shows swine producers and multiple crop producers mainly rank the significantly different organic information services as very useful. "Representation on public policy issues" and "crop insurance" are not ranked highly overall on average, yet multiple-commodity producers and row crop producers identify organic crop insurance programs as being beneficial and rank crop insurance beyond the upper reaches of the confidence interval for the average response on crop insurance. Organic price reporting services were ranked highest among swine producers and lowest among poultry/egg producers and beef producers. Swine producers also ranked the availability of organic processing facilities equally as high as organic price reporting services. Greenhouse/floriculture, vegetable/nut producers, and beef producers ranked organic price-reporting services as relatively unimportant. Among the producers themselves, swine producers and producers of multiple commodities seem to have the most differing opinions in terms of the benefit of informational services (they had more statistically significant variation from the other producer groups).

Conclusions and Policy Implications

The results of this survey reveal a significant amount of information about producer perceptions of the challenges associated with growing and raising organics. From this knowledge of producer perceptions, policy recommendations can be developed to assist producers in adopting organic production and overcoming these perceived challenges. These recommendations will assist in overcoming the significant barriers with regard to the adoption of organic production practices in Texas. If expansion and promotion of organic production practices is a goal, assisting producers in overcoming production barriers should be a primary focus for policy makers.

As a whole, producers do not see any individual production or marketing barrier as a severe barrier to organic adoption. Of the production barriers identified, availability of organic processing facilities was ranked as being one of the more significant barriers. However, upon further analysis swine producers distinguish themselves from the rest of the group as placing a high degree of importance on the availability of organic processing facilities in order to pursue organic production. Assistance in the development of organic processing facilities for pork producers can come from local governments in the form of tax abatements, or lender support may create the development of new processing facilities.

There are statistical differences in terms of barriers between producers who identify themselves as having an interest in organics and those with no interest in organics. As expected, it is generally true that those indicating they have an interest in organics rank most barriers as less severe than do those with no interest. Among the producers with interest, the production barriers ranked most severe in terms of organics adoption were "high input costs," "organic inputs," and "organic processing facilities." However, no production barriers are ranked as a severe barrier to adoption, therefore indicating that those with interest believe a market is available for organic products.

The results show those respondents most often interested in organic adoption are vegetable/fruit producers, greenhouse/floriculture producers, and multiple-commodity producers, which are primarily beef producers. Producers interested in organic production are typically smaller in size. Older producers make up a higher percentage (70 percent) of producers who are currently practicing certified and/or non-certified organic production compared to newer producers. Although this result may be initially surprising, it follows anecdotal evidence shown by Lampkin (1994) to suggest that established (and thus older) producers are more likely to adopt emerging technologies.

Based on this information, efforts should be directed toward smaller, established producers in vegetables/fruits and greenhouses/floriculture, as they showed more interest in the adoption of organic practices and viewed fewer barriers to market entry. Older producers are more established and show willingness to take on the additional risk of organic production. Also, the producers who are currently practicing organic production but are non-certified should be targeted for certification.

"High input cost" and "availability of organic

inputs" can be addressed through supply co-operatives and supplier directories. Despite the difficulties associated with the development and success of supply co-operatives, supplier co-operatives are one possible alternative to alleviating input cost pressures for organic producers. The cost of organic inputs required for production strains producers during the three-year transition period where output cannot be sold at the organic price level. This cost-price squeeze puts financial pressure on producers. A supply co-operative may assist producers in obtaining the required inputs and, more importantly, offer the possibility of lower-priced organic inputs because of increased purchasing power and volume associated with the co-operative. Most producers are smaller in size; hence obtaining inputs at a relative low price is constrained by volume. A supplier co-operative has the potential to alleviate that constraint.

As a whole, producers did not find any information service to be very useful. However, there were significant differences among producer groups. The producers of vegetables/fruits and greenhouse/floriculture rank information services on "directories of organic buyers," "education programs about organics," "local/regional organic market development," and "organic-specific research/extension" as the main information services that are most useful for adoption. Most information services are about markets and buyers rather than production. Producers feel there are markets available, but that establishing contact and finding them is the key for success.

For producers already interested in organic production, almost all information services are considered "very useful." Relatively speaking, the lowest-ranked information services were "export/market development," "representation on organics-related public policy issues," "marketing co-operatives/associations," and "crop insurance." The information services ranked highest are similar to the overall rakings, where "directories of organic buyers," "education programs about organics," and "local/regional organic market development" are the information services deemed very useful.

Based on the results, it is clear which strategies for information services will be beneficial to Texas producers. First, a series of educational seminars on organic requirements and certification procedures will be helpful to inform producers of the benefits, risks, and processes. This will help clear up any misconceptions and provide a clear pathway for producers in adopting organic practices.

Second, a directory of local and regional organic buyers and markets should be developed and maintained for organic producers. An online database may be beneficial, where producers can log-on and search for potential buyers of their products. This will narrow the information gap and lower the transaction costs for producers, as they will not have to search for buyers. Also, as a potential source of revenue to offset database cost, buyers could be asked to pay to be listed on the database so that they will have access to finding organic suppliers and meet the demand of consumers.

Third is assistance in developing local/regional markets. Producers feel there is demand for organic products and markets, but the distance traveled may be too great to overcome the additional cost. Local/regional markets can be developed through marketing-assistance programs to educate consumers about the availability of locally grown organic products. A "GO TEXAN" organic label could be useful in leveraging the popularity of the existing logo. This would easily identify Texas-grown organic products.

Financial risk from adoption or transitioning seems to be a common concern. Specifically, most producers are unsure whether lenders support the idea of organic production. Support from lenders is critical in assisting producers when undertaking the three-year transition process to become certified organic. Lenders must understand that during this period farm income may decrease and assistance will be needed. An education program should be developed where lenders are shown the problems with organic production and the financial constraints likely to occur during the transition period. Having lenders opt in will greatly assist producers in overcoming the financial burdens of switching to organic production.

Texas producers have lagged behind national organic production adoption rates. This survey identifies key marketing and production barriers that producers attribute to their unwillingness to move into the organic markets. Distance to markets, price premiums, and a lack of marketing networks are key marketing conditions barriers to entry in the organics market, while the availability of organic processing facilities is the most significant production condition barrier. Marketing barriers

showed more distinction between producer groups as compared to production barriers. There seemed to be little concern for representation on public policy issues and crop insurance as a barrier. Efforts to target distinct producer groups can be done using these survey results through an increase in lender support of organic production, development of local/regional markets, and development of a directory of local/regional buyers.

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