Does Sustainability Matter? A Study of Floriculture Growers

Tanya J. Hall¹, Jennifer L. Dennis¹, and Roberto G. Lopez²

¹Purdue University, Department of Agricultural Economics, 403 W. State Street, West Lafayette, IN 47907
²Department of Horticulture and Landscape Architecture, 625 Agricultural Mall Drive, West Lafayette, IN 47907

Index words: Barriers to entry, floriculture industry, risk, survey, sustainability

Significance to the Industry: Sustainable floriculture production is an emerging issue for floriculture producers, yet most producers do not have a clear understanding of this topic and may perceive barriers to entry for implementing sustainable practices. Von Wizsacker (1980) defined barriers to entry as costs undertaken by a firm seeking to enter an industry beyond expenses of an existing firm. The purpose of this study is to determine if producers perceive barriers to becoming sustainable.

Most bedding, potted flowering and ornamental foliage plants must be grown under controlled environments or protected structures (USDA, 2008). Floriculture crops are grown under polyethylene or glass structures, and in non-recyclable plastic pots, trays and liners (USDA, 2008). In temperate regions, the structures must be heated with the use of natural gas, propane, or other non-renewable energy resources to optimize plant growth. Since floriculture crops are grown under protected structures, they must be irrigated by hand or mechanically. Similar to outdoor production, plants grown in greenhouses and protected structures are susceptible to insects and diseases, requiring the intensive use of insecticides and fungicides to minimize the impact on the developing crop.

Containerized greenhouse and nursery crops are commonly grown in plastic containers of varying sizes and shapes, depending on the crop and targeted market (Evans and Hensley, 2004). Additional plastic usages in the floriculture industry include greenhouse films, pot tags, and packaging (Garthe and Kowal, 1993). Typically these non-reusable plastic containers are disposed by consumers, thus presenting a significant disposal issue for the horticulture industry (Evans and Hensley, 2004). In 1993, it was estimated that within the floriculture and nursery industries, 408 million pounds of plastic were generated. Of the 408 million pounds, 23 (5.6%), 90 (22%), 240 (58.8%) and 55 (13.5%) million pounds, respectively were used for greenhouse films, mulch films for the nursery industry, pots, trays, packs, and flats (Garthe and Kowal, 1993).

Changing to a sustainable production system requires a strategic re-orientation of the firm's organizational structure and goals, a dramatic allocation of economic resources, and a willingness to accept a higher degree of risk (Kalogeras et al., 2006). Risk aversion is a common determinant in the adoption and utilization of agricultural technologies in farm operations (Huisjman, 1986). To reach the goal of having a sustainable business through the use of sustainable production practices, changes in...
the daily operations will need to be made by the producer. Changes may include investments in machinery, training, personnel and organic inputs. Undertaking these changes involve a higher degree of risk as the producer switches from conventional methods of production and may have few standards for reference as it is relatively new and changing.

Economic viability is another barrier to entry. Perceived profitability influences producer’s decisions (Cary and Wilkinson, 1997). Kalogeras, Pennings, and Garcia (2006), reported that producers who considered switching to sustainable practices were concerned about the economic viability of these practices. Perceptions of long-term profit was a significant predictor of the decision to use conservation practices such as planting trees and planting deep rooted pasture (Cary and Wilkinson, 1997). In this study, pro-environmental attitudes did not translate into pro-environmental behavior unless there were economic benefits associated with the behavior (Cary and Wilkinson, 1997).

The age of the producer can be a barrier to entry of new technologies. Barreiro-Hurle et al., (2008) evaluated how the intensity level of change affected the adoption of new technologies and evaluated its correlation with socio-economic factors. Barreiro-Hurle et al., (2008) found producers older than 55 were more likely to participate in agri-environmental schemes, if the requirements involved little labor and did not request new investments in capital or knowledge. This indicates that producers older than 54 or 55 avoid adopting new production practices unless the new practices does not involve physical labor or new investments.

Nature of Work: The objective of this study is to identify barriers to entry into sustainable practices amongst floriculture producers. A convenience sample of floriculture producers nationwide were surveyed in June through October, 2008 through various outlets. A mail and internet survey was conducted by sending letters to several state associations and by creating a brief article that was distributed to the trade press encouraging producers to participate in the online survey. Trade press outlets included: GreenTalks, Greenhouse Grower Benchrunner, GMPro Project: Green Industry, GPN weekly. Mail surveys were given at the Ohio Florist Association (OFA) Short Course. State associations were sent a link to the online survey. Several state associations aided in sending the letter including: MN, CT, IL, KY, ME, MD, IN, CO, CA, MI, NC, PA, RI, VA, and WI. Other producer events that the questionnaire was promoted include the DS Cole open house the Indiana Floriculture Growers Association conference. The questionnaire was developed based on an extensive literature search and Dillman (2007) survey methods. Respondents were asked questions relating to the importance of sustainability, sustainable practices they had/or were planning to put in place, attitude towards profitability, risk, and sustainability, barriers to sustainable production practices and producer demographics (size, sales, crops, age, education and ethnicity).

The survey was completed by 112 respondents with the majority of responses coming from the Midwest (48.2%). Responses from other regions include the South, West, and Northeast regions at 15.2%, 15.2%, and 9.8%, respectively. Approximately 10% did not
Producers reported size by the volume of annual gross sales. More than a quarter (26.4%) made less than $100,000, 20.8% made $100,001 to 500,000, 18.8% made $500,001 to 2 million, 18.9% made $2,000,001 to 10 million, and 15.1% reported sales greater than $10,000,001 million. The respondent’s median size was $500,001 to 1 million in gross sales with a standard deviation of 2.7. The median covered greenhouse production area was 30,000 square feet and the median outdoor production area was 43,560 square feet. The majority of the respondents were born in the following years: 1930’s (3.7%), 1940’s (9.3%), 1950’s (42%), 1960’s (22.4%), 1970’s (16.9%), and 1980’s (5.6%). Therefore, the majority of respondents was born in the 1950’s and as of 2008, would be 58 to 49 years old.

**Results:** Overwhelmingly 95.5% of respondents had heard of sustainable floriculture and the majority (65.2%) viewed sustainable practices as “very important” to the environment. When asked if sustainable practices were used in their operations, 63.1% of respondents said ‘yes’ and another 24.3% were in the process of becoming sustainable. Recycling plastic pots and/or greenhouse glazings was the most common sustainable practice producers currently have in place (72.7%) followed by water recycling and/or conservation (62.4%), energy conservation (58.2%), composting (57.3%), and biological controls (56.9%) (see Figure 1).

Producers were asked to rank, in order of importance, the sustainable practices that they would like to implement. The top five rankings were: recycling plastic pots/greenhouse glazings, biological controls, conservation of energy, water recycling/conservation, and alternative energy sources (see Figure 2). Results indicate that producers have similar interests in the sustainable practices they have implemented and/or want to implement. Producers may perceive these practices as ‘easier’ to implement, thus the reason for similar results.

Respondents were asked questions about their attitude towards implementing sustainable practices using a 7 point Likert scale. A one on the Likert scale indicated the respondent strongly disagreed with the statement and a 7 indicated strong agreement with the statement. Respondents agreed that implementing sustainable practices would be a worthy investment (67.5%) as it was a viable marketing trend (63%). However, respondents were uncertain on whether becoming sustainable would generate more profits for their operation (54.9%). Producers were not sure how consumers would respond to sustainability shown by the two responses below. Less than half (47.7%) of producers were uncertain whether customers would value sustainable floriculture production practices. Furthermore, most of producers (61.2%) were uncertain on whether customers cared how the end product was produced. Producers either disagreed or were undecided with the statement that the conversion to sustainable production was risky (71.1%). Therefore, producers in general may have a positive attitude towards adopting sustainable practices but question whether customers care about their production practices and if conversion would be profitable.

Producers were asked to rank factors they considered important before implementing sustainable practices. The top consideration was cost of the practice (87.7%) (see Figure
These results show producers heavily consider cost over other concerns such as how these practices may affect the environment, potentially increase profits or satisfy customer demand. Producers who feel cost are their top considerations are concerned about the economic viability of sustainable practices, specifically, how it will impact their expenses.

**Discussion and Conclusions:** Results from this study indicate producers do perceive barriers to entry into sustainable floriculture production. Concern about economic viability is the primary barrier as respondents are concerned about the cost of implementation and indicated that limited availability of money was their top barrier to adoption of sustainable practices. Although respondents had pro-environmental attitudes towards sustainability and its importance to the environment, they may not exhibit pro-environmental behavior due to the perceived expense of becoming sustainable. It appears that profitability from conversion is not as pressing of a concern, rather the initial expense of becoming sustainable. Although producers do not indicate risk as being a primary barrier to entry, their responses about financial capital show risk adverse behavior towards financial investments. Therefore, respondents may not view conversion to sustainable practices as risky in regards to yield loss, loss of customers, etc., yet investing the necessary capital towards sustainable practices as risky.

**Literature Cited**

Figure 1. Current sustainable production practices.

Figure 2. Sustainable practices producers want to implement.
Figure 3. Key factors considered by floriculture producers.