GREEN (HOUSE) GEOGRAPHIES: METROPOLITAN AND NON-METRPOLITAN DIFFERENCES IN THE OHIO GREENHOUSE INDUSTRY

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1. INTRODUCTION

Over the past 20 years, the geography of industry has changed considerably with the emergence of key technologies that compress time and space. Indeed, many industries have been liberated from this spatial context by new technologies (Beyers and Lindahl, 1996), which enable services to be delivered at a distance. Yet, some industries are inherently place-bound and rural and urban differences continue to be observed (Gatrell, 2002, 1999; Glasmeier and Howland 1994, 1995). In this study, we investigate rural and urban dynamics of one industry—greenhouses—that has historically been place-bound.

The purpose of this paper is to investigate the structure of the Ohio greenhouse industry's markets, production capacities, and core competencies of metropolitan and non-metropolitan growers. The comparative analysis will use data collected from a survey of greenhouse growers to determine the similarities and differences among metropolitan and non-metropolitan greenhouse growers with respect to the geography of sales, total sales, firm investment, age, size, and product mix. This study will further help decision makers to craft policies that encourage the growth of the Ohio greenhouse industry.

2. STUDY

The Ohio Greenhouse project is a multi-year initiative to determine the overall structure and core competencies of the industry. This research has been driven by members of Ohio's congressional delegation, particularly Representative Marcy Kaptur and Senator Mike DeWine, who are concerned about the overall competitiveness of the state's industry locally, regionally, and globally (Kaptur, 2004; www.ohiogreenhouse.com, 2005). This survey is a statewide continuation of a fiscal year 2003 project that piloted the research program in the northwest Ohio counties surrounding Toledo.

2.1 THE SPATIAL AND ECONOMIC CONTEXT OF THE GREENHOUSE INDUSTRY

The geography of greenhouses and the greenhouse industry has been under-studied by geographers. Farm geography literature has been studied at great length; however, studies aimed at addressing the characteristics of the high-tech greenhouse sector have, to date, been overlooked. Insofar as greenhouses represent a component of the agricultural sector, agricultural geographies can be used to frame greenhouse discussions. In particular, two themes in farm geography—urban change (Furuseth, 2001; Smith, 1999; Birdsall, 2001; Hart, 1995) and increasing scale of operation (Knutsen et al, 1998; Hart and Mayda, 1998, 1997; Furuseth, 2001)—echo the challenges facing greenhouses. Like farms, greenhouses are increasingly faced with the realities of competing land uses and changing zoning policies in urban areas. Similarly, the competitive nature of the greenhouse industry has resulted in an overall industrialization of greenhouses. The industrialization takes place as firms scale-up activities and deploy new capital-intensive technologies to increase productivity. When combined, the forces of urbanization and industrialization have the potential to transform greenhouse industries from family-centered businesses to corporate ventures. Indeed, movement away from family-centered agriculture is a key concern of Representative Kaptur (Kaptur, 2005). In addition to changing industry structures, greenhouses face increased global competition as a result of the North American Free Trade Agreement (NAFTA), which has dramatically altered local, national, and global markets (Reid and Lindquist 2005). In concert, external forces have the very real potential of impacting the overall greenhouse industry. In the case of Ohio, the effects of NAFTA has clear implications concerning the overall competitiveness of the industry.

3. METHODS AND RESPONSES

A sample of 500 participants was extracted from the Ohio Floriculture Association (OFA an association of floriculture professionals) directory of active members. As OFA includes members from around the nation and world, only Ohio members were included in the random sample. In practice, the extracted sample of 500 growers accounted from nearly 95 percent of all eligible OFA members. Respondents received a nominal stipend of twenty-dollars for participation. Questions were developed to unpack the current practices and to reveal the state of Ohio's greenhouses. Production methods and materials, employment trends, as well as financial aspects, were inspected to elucidate the underlying tenants of Ohio's greenhouse geography. OFA and the United States Department of Agriculture (USDA) were instrumental in developing widespread interest in the study. In particular, OFA utilized its mailing list to encourage participation from members. The Toledo Botanical Gardens mailed 500 copies of the survey to respondents. In all, 24.2 percent of mailed surveys were returned (FIGURE 1). The responses were entered into an electronic database to enable descriptive statistical analysis.

4. METROPOLITAN AND NON-METROPOLITAN DESIGNATIONS

Historically, economic geography has focused on individual industrial sectors in urban areas (Gatrell 1999). When rural industries have been studied, the emphasis has tended to be on the spatial division of labor and observed rural-urban differences (Glasmeier and Howland, 1994). However, greenhouses are unique, because the spatial division of labor—with respect to skills, competencies, and wages—does not reflect the geography of traditional industry (i.e., manufacturing) (Gatrell, 1999). To that end, the study examines both metropolitan and non-metropolitan (to be read urban and rural) greenhouse firms. Metropolitan and non-metropolitan designations of counties are drawn from the Census' Metropolitan Statistical Area (MSA) definitions. Based on MSA definitions, 42 of Ohio's 88 counties are defined as metropolitan (FIGURE 2).[1]

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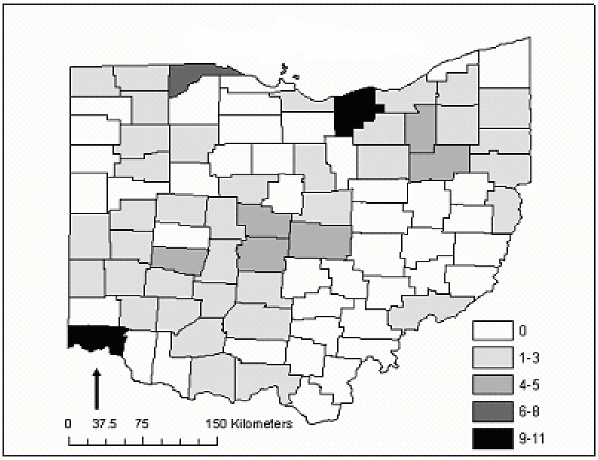
[1] Unfortunately, the availability of data on the exact contribution of greenhouse industries at the county scale is limited by issues of data suppression and the associated Bureau of Labor Statistics and Census Bureau reporting guidelines. In fact, Johnson-Webb (2005) demonstrates the large numbers of missing cases and limitations associated with reporting relevant four-digit NAICS data for the greenhouse industry.

FIGURE 1
SURVEY RESPONSES: OHIO



5. RESULTS

The following section will report findings that demonstrate the structural differences present in Ohio's greenhouse firms in relation to the production facilities' metropolitan or non-metropolitan geography.

5.1 CHARACTER OF FIRMS: FIRM STRUCTURE, EXPERIENCE & SEASONALITY

The structure of greenhouse firms is unique in that the industry is often a family-based-seasonal operation with a long tradition in regards to operational history. However, the exact character of firms varies by respective urban or rural designations. Although the majority of all firms are family-owned businesses(usually sole proprietorships), urban respondents were more likely to be family-owned compared to respondents classified as non-metropolitan businesses. In fact, only 52 percent of non-metropolitan respondents were family businesses compared to 67 percent of urban firms. Given the industry's linkages to agriculture, the results might be considered counter-intuitive, as agriculture has historically been a rural activity. Likewise, urban firms have more expertise based on the experience of the current owner and/or head growe within the industry than their non-metropolitan counterparts. Survey results indicate that 66 percent of growers within U.S. Census defined metropolitan statistical areas (MSAs) have accumulated more than 11 years of owner or grower experience compared to only 45 percent of rural growers (TABLE 1). In addition to the experience of the owner or head grower, urban firms have been in operation for a greater length of time than rural firms(TABLE 2). In short, businesses located within an MSA have been operating longer and have more experienced personnel than firms located in non-MSA counties.

TABLE 1

	NUMBER OF YEARS IN OPERATION (FIRM)						TOTAL
	<1	1-5	6-10	11-20	21-40	>40	
MSA	6	7	10	15	25	1	64
NonMSA	7	4	15	9	11	0	46
							N=110

While the firm type, experience, and length in operation indicators are somewhat unexpected, the observed temporal characteristics of firms' operations were more consistent with the expected metropolitan and non-metropolitan differences. That is, non-metropolitan greenhouses are more likely to operate seasonally. Survey results indicate that two urban firms are open on an annual basis for every non-metro establishment open year-round. No doubt the relative market potential of MSA and non-MSA regions account for this difference. However, the chi-square analysis was not statistically significant.

FIGURE 2
METROPOLITAN STATISTICAL AREAS: OHIO

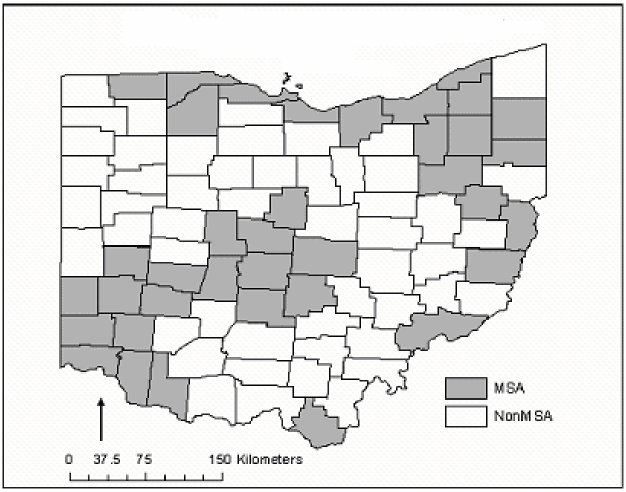


TABLE 2

	YEARS OF INDUSTRY EXPERIENCE (RESPONDENT)					TOTAL
	<1	1-5	6-10	11-20	21-40	
MSA	4	7	11	36	7	65
NonMSA	3	7	14	16	4	44
						N=109

5.2 PRODUCTION

The production capacity of greenhouse firms varies by MSA designation (χ^2=11.4, p=.044). MSA firms tend to have larger facilities in terms of total production under glass, plastic, or other translucent medium (TABLE 3). However, non-MSA respondents indicate that production facilities are expanding (or planning to expand) at a greater rate than MSA firms (TABLE 3). According to respondents, rural firms are steadily developing greater production capabilities by adding total square foot under glass, plastic, or other materials. Urban growers have expanded facilities at a rate 12 percent less than that observed by non-MSA firms.

5.3 SALES & PRODUCTION CAPACITY

The gross sales reported for the 2003 term clearly suggest that it paid to be located within an MSA. Gross revenues of at least one-hundred-thousand dollars were recorded for more than 81 percent of urban entrepreneurs (TABLE 4).

TABLE 3

	AREA OF PRODUCTION GREENHOUSE (SQ. FT.)						TOTAL
	<10k	10k-24,999	25k-99,999	100k-249,999	250k-499,999	>500k	
MSA	13	8	24	13	3	5	66
NonMSA	9	15	15	4	0	1	44
							N=110

TABLE 4

	GROSS GREENHOUSE SALES 2003 (THOUSANDS)				TOTAL
	<10	10-99.999	100-499.999	>500	
MSA	3	9	18	34	64
NonMSA	0	16	16	12	44
					N=108

In contrast, 64 percent of rural growers exceeded \$100,000 in sales. More impressively, 63 percent of MSA operations earned more than one-half of one million dollars in 2003. In comparison, slightly more than one-quarter of non-metro businesses attained the same financial benchmark as nearly two-thirds of urban growers. While the amount of enclosed production space appears to co-vary positively with the amount of gross sales, size is not indicative of growth potential in regard to gross increase. Five-year sales trends for non-MSA firms are out-performing urban growers in all three measured parameters- as increase, decrease, or no change in gross sales since 2000. Based on chi-square analysis, the observed rural and urban differences are statistically significant (χ^2=12.1, p=.006). More marked are the percentages of increases for rural firms. Nearly 19 percent of non-MSA growers reported increases in gross margins of more than 40 percent (TABLE 5). One-third of all rural producers realized gains in gross sales of more than 10 percent. While only 18 percent of urban firms grew sales of 10 percent or more. Interestingly, both urban and rural growers sell about 77 percent of their finished products to local customers. However, rural producers sell 20 percent more finished products to on-site customers than metropolitan growers. These findings--with respect to geography of sales--will have further implications upon the perceptions of competition by growers in regions of varied distances from individual firms.

TABLE 5

	SALES TREND SINCE 2000			TOTAL
	NO CHANGE	INCREASE	DECREASE	
MSA	20	34	12	66
NonMSA	12	30	6	48
				N=114

5.4 MARKET COMPETITION

Businesses located outside of the MSA perceive less local competition than their urban counterparts. Nearly one-third of urban greenhouses feel the local marketplace is highly competitive; whereas, about 20 percent of rural growers rate local competition high. In fact, firms located within MSAs are more sensitive to competition than rural growers. One-quarter of MSA greenhouses feel Canada is an important competitive threat. In contrast, roughly one out of ten rural producers perceived the existence of a Canadian threat to markets. The delineation of the geographies of competition and sales, combine to influence methods adopted by firms to address perceived competition. Clearly a product of physical location is the decision of 23 percent of MSA growers to lower price to address the competitive nature of

Ohio’s greenhouse industry. Less than 9 percent of rural businesses feel that lowering price is necessary to meet competitive demands. Developing a niche product market to address competition is a strategy largely employed by non-metro firms. For instance, more than three-quarters of rural greenhouses believe that the creation of a niche market is a profitable strategy. In contrast, 60 percent of metropolitan enterprises are working to cultivate products within a particular niche.

5.5 INDUSTRY TRAJECTORY

To assess the overall trajectory of the industry, respondents were asked about future plans concerning the facets of labor growth, procduction expansion, structural trends, (e.g., co-operative, production, and marketing arrangements) and the overall potential for industry growth. The overwhelming majority (i.e. 93 percent) of Ohio’s greenhouses have no immediate plans of selling, downsizing, or closing facilities. In fact, 68 percent of rural firms and 73 percent of metropolitan growers have intentions of modernizing production facilities during the next five years. About two-thirds of MSA and rural firms report having interest in creating cooperatives with other growers. These cooperatives would provide an effective means of addressing increasing costs associated with fuels, soil-media, and plastic products necessary to plant production and distribution. While approximately one-third of firms within both MSA and non-MSA regions have increased the total number of employees during the past five years, 18 percent of MSA growers have decreased the number of workers within their respective facilities (TABLE 6).

TABLE 6

	EMPLOMENT TREND SINCE 2000			TOTAL
	NO CHANGE	INCREASE	DECREASE	
MSA	26	20	10	56
NonMSA	22	15	5	42
				N=98

Decreasing gross sales, lowered employment, and stagnant growth in regard to total production area resulted in urban growers reporting a less than optimistic outlook for the statewide industry. Alternatively, rural growers have an overall positive outlook for the greenhouse industry during the next five years. More than 39 percent of non-metro firms expect profits to increase during the next several years. This is in contrast to the less than one-quarter of metro growers that believe their profits will increase. Furthermore, just more than half of metropolitan statistical county growers forecasted that their businesses will be less profitable in the near future (TABLE 7). There are a number of factors that could play into the attitudes and ultimately this discovery of regionally dependent cultural outlooks. As previously stated, MSA firms are more likely to be family ran businesses in operation for more than two decades. Thus, rural growers are more often younger, less experienced, and aspiring entrepreneurs that believe in the viability of their fledgling businesses and related substantial investments.

TABLE 7

	FIVE-YEAR INDUSTRY PROFIT FORECAST			TOTAL
	NO CHANGE	INCREASE	DECREASE	
MSA	15	13	29	57
NonMSA	7	15	16	38
				N=95

6. CONCLUSION

The goal of the 2004 Ohio Greenhouse Survey was to measure observed practices, attitudes, and fiscal realities of the firms. This paper demonstrates the landscape of the Ohio greenhouse industry varies between metropolitan and non-metropolitan statistical designations. However, the observed variations suggest the geography of greenhouses is counter-factual. Whereas the researchers expected rural firms to be larger, more likely to be family-owned, more experienced, and have longer operational histories based on the historical geography and conventional wisdom surrounding agriculture, urban firms met these criteria. As such, the findings reveal that the greenhouse firms may be a suburban phenomenon. That is, the market potential of urban areas appears to drive industry growth, as urban firms tend to be year-round activities. This assertion is indirectly supported by the observation that non-MSA firms (most likely in suburban areas) are younger-growing firms based on the self-reporting of respondents. Indeed, non-MSA firms are more optimistic about the future as markets move in their direction. The real challenge facing smaller non-MSA firms may be the growing cost structures associated with urbanization and pressures associated with competing land uses and their ability to strike a balance between capital investment and market growth. For this reason, the overall health of non-MSA firms is heavily dependent upon strategic planning and market development activities. In contrast, the future trajectory of MSA firms is unclear, as their capacity to expand production and to grow markets is uneven.

In the end, the geography of Ohio's greenhouses is an unexpected one. Whereas agriculture has been a rural phenomenon—urbanization (and perhaps more importantly suburbanization) and its associated lifestyle dynamics appear to be the primary determinants of firm structure, sales, as well as the highly localized nature of greenhouse markets. Indeed, suburbanization itself may explain the shorter terms of operation as traditional farmers may have transformed their operations from the fields to the greenhouses in an attempt to adapt to the changing economics of agriculture. In any event, the Ohio greenhouse is a dynamic industry with observed urban and rural differences. Over the next two fiscal years, the USDA Ohio Greenhouse research team will explore a number of interrelated policy and research issues. In the future, we anticipate exploring cooperative marketing and branding efforts in NW Ohio—as well as the changing perceptions of growers with respect to market changes locally and globally. Indeed, a more focused analysis of greenhouse economics at the county scale is necessary to properly contextualize the statewide study. Additionally, we anticipate completing a series of intensive interviews and focus groups to expand on the initial statewide survey results reported in this paper. Finally, we hope our research encourages other geographers to explore the intriguing geographies of under-studied industries like greenhouses.

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