

Farming at the Rural Urban Interface

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Agricultural Change at the RUI

Population growth and development in areas adjacent to large urbanized areas results in substantial farming amidst growing large nonfarm populations (Heimlich and Anderson 2001). Despite the challenges of farming in these settings (Berry 1979), agriculture has proven to be resilient (Ilbery 1985).

Several, generally nontraditional forms of agriculture have been promoted as ways to overcome some of the difficulties of farming at the RUI and to take advantage of urban proximity (Lapping and Pfeffer 1997; Lyson and Green 1999). While empirical analyses of overall sales and productivity reveal that agriculture persists at the RUI, less attention has been given to analyzing data that can reveal the extent to which nontraditional enterprises exist in these areas. In this poster, we ask two fundamental questions to understand the structure of agriculture at the RUI and validate existing models of urban influenced agriculture.

Q1: Are practices commonly thought of as urban oriented agricultural really more common in metro areas?

Q2: If these enterprises are more numerous at the RUI, are they more common in agriculturally important counties or in metro counties with more limited agricultural activity?

Background & Theory

Farm structure at the RUI can be characterized by a diverse a mix of traditional commodity farms as well as adaptive and hobby farms exploiting opportunities to direct market farm products to proximate large, urban populations. (Johnston and Bryant 1987).

To understand the spatial structure of agriculture at the RUI, several explanations/models exist:

Classic models of agriculture at the RUI anticipate the type of agriculture at the RUI will be organized according to distance from urban core (Von Thunnen) or land rents (Sinclair 1967). These models hypothesize the highest value and/or hard to transport or most easily perishable goods locate closest to the urban edge.

Thomas and Howell's (2003) analysis confirms the thesis that transportation or land rents are important factors. They found that metro counties tend to lead in sales of fruits /vegetables, and nursery/greenhouse crops, whereas poultry, dairy and other livestock concentrate in fringe metro counties, while non-adjacent non-metro counties dominate in sales of grains, cattle, and hog products.

Researchers have assumed that alternative farming strategies such as urban oriented agriculture (Farmers Markets, CSA's, U-Pick operations, Agri-tourism) are able to generate higher economic returns per acre, potentially offsetting the challenges of rising land values at the RUI (Lockerez 1997).

Data and Analysis

The number of farms and sales values for *direct sales*, *greenhouse and nursery production*, *organic production*, *horse sales*, and *recreational services* were obtained for each county in the 48 contiguous United States from the 2002 U.S. Census of Agriculture (n= 3068) (**Table 1**).

Counties were coded as Metropolitan or Non-Metropolitan and were further defined as agriculturally important or non-agriculturally important.

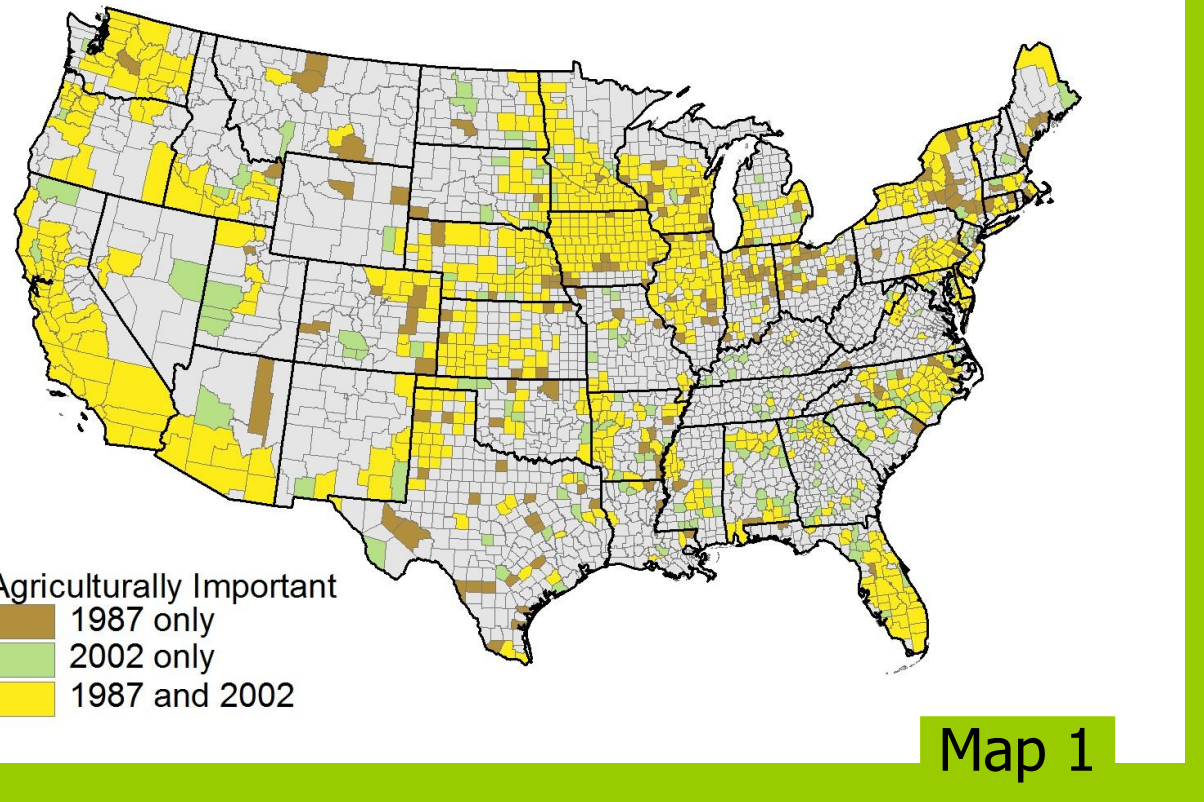
Agriculturally Important Counties were defined as either in the top quartile of sales in 1987 or 2002, or second quartile of sales in 1987 or 2002 AND top quartile of sales/farmland or sales/cropland in 1987 or 2002; AND had greater then 50 farms (**Map 1**).

To understand how the RUI influences the spatial patterns of structural changes we compared coded variables to national total sales for each Metro category. We then examined the top ten counties for farms and sales of each indicator.

Due to the small number of farms engaging in these activities sales data was suppressed for some counties. In this poster suppressed sales are treated as missing.

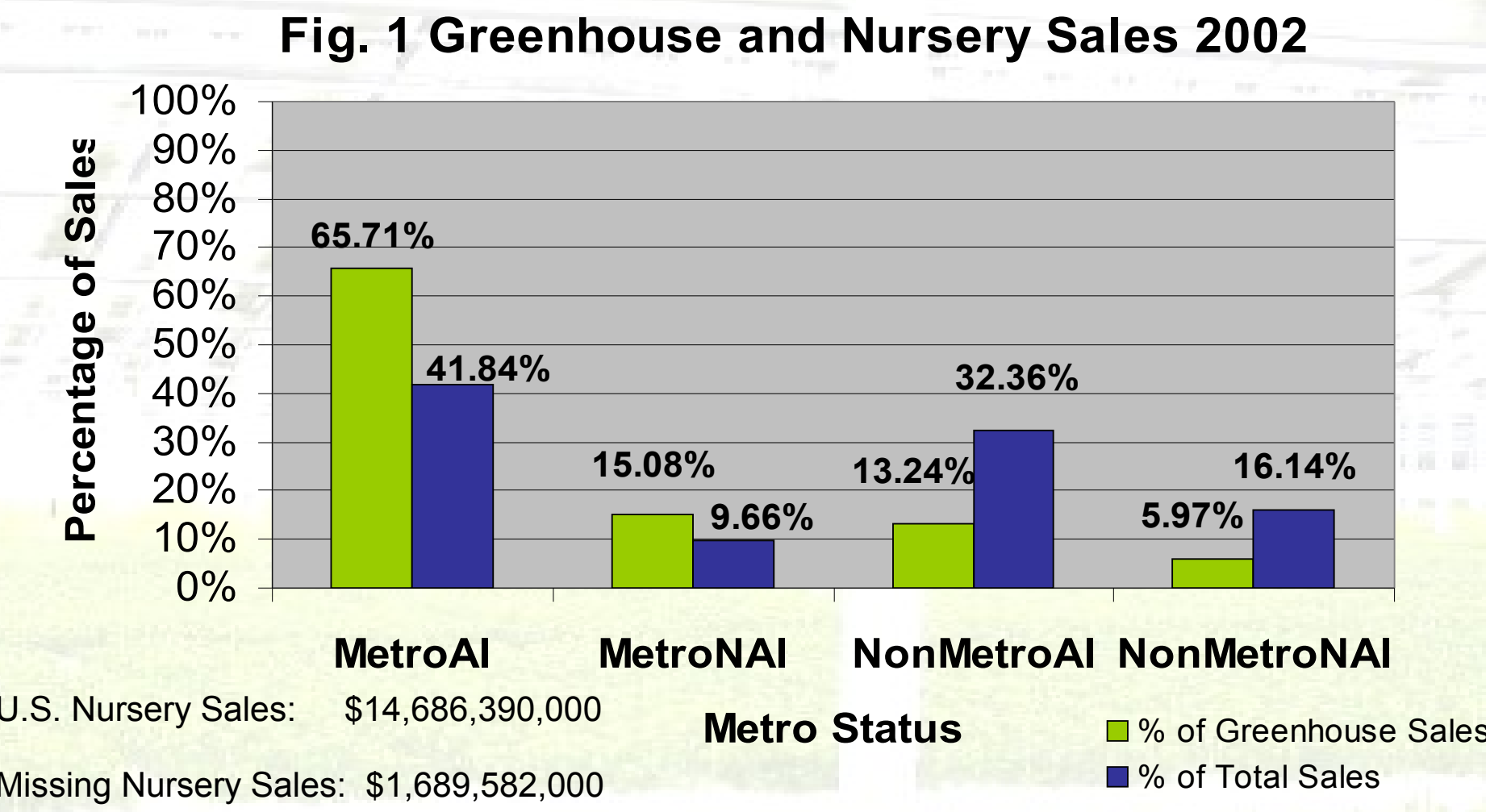
Initial analysis revealed the significance of California in organic production and direct sales. To better understand the spatial distribution of organic agriculture and direct sales, in some cases, California was treated separately in the analysis.

Table 1. Frequencies and Percentages of County Distributions		
	Counties	% of US Counties*
Metropolitan	1054	34.4%
Non-Metropolitan	2013	65.6%
RUI	1,522	49.6%
Ag. Important	1,946	63.4%
Ag. Important-RUI	619	20.2%
*lower 48 states		



Greenhouse & Nursery Production

Table 2. Top Ten Counties with Greenhouse and Nursery Sales 2002				
State	County	Metro Status	Farms	
California	San Diego	Metro-AI	895	
Florida	Dade	Metro-AI	714	
California	Monterey	Metro-AI	192	
California	Ventura	Metro-AI	202	
Pennsylvania	Chester	Metro-AI	213	
Florida	Orange	Metro-AI	315	
California	Los Angeles	Metro-AI	317	
Oregon	Clackamas	Metro-AI	778	
California	Orange	Metro-AI	106	
Oregon	Marion	Metro-AI	466	



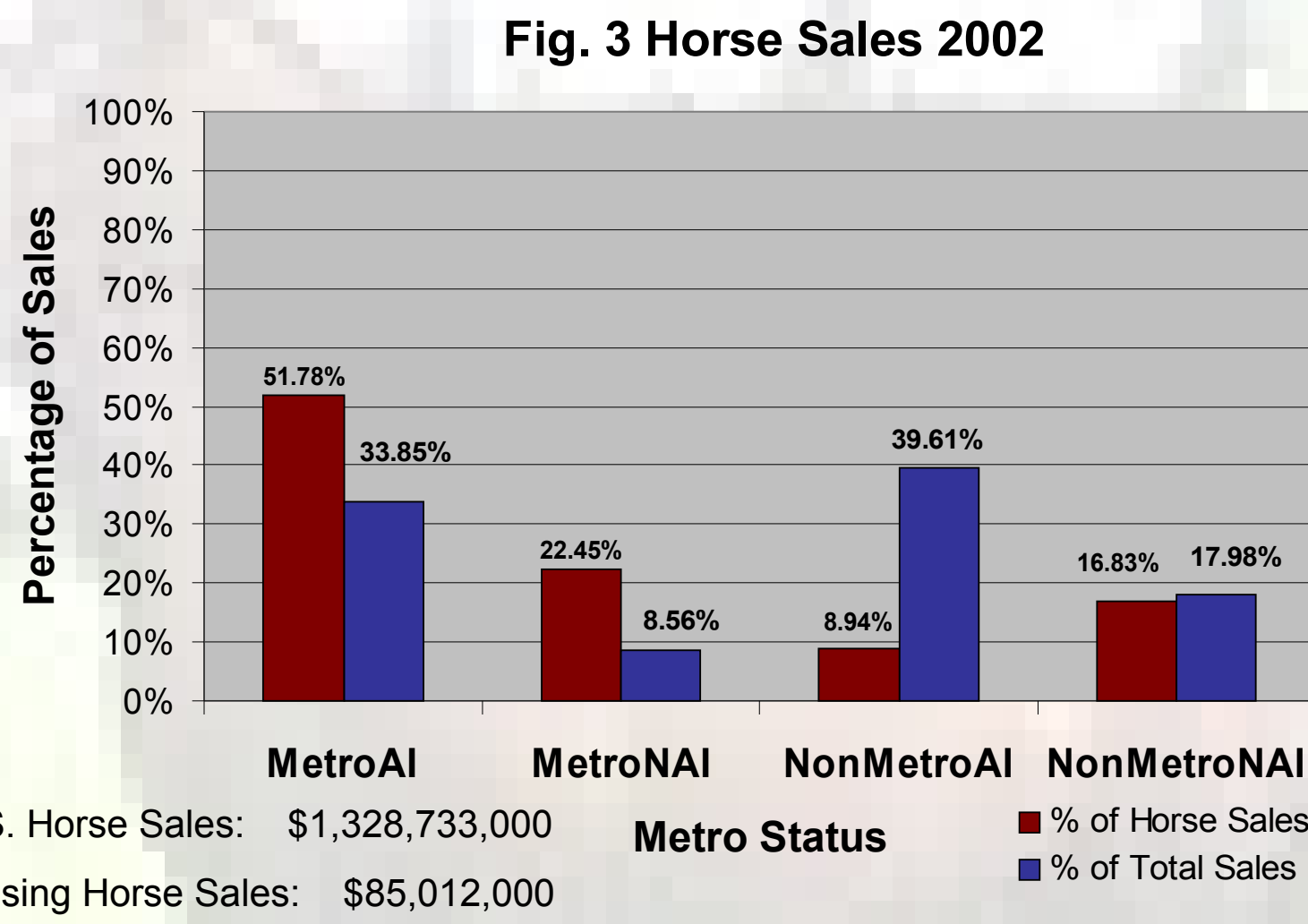
Q1: Greenhouse and nursery sales do appear to concentrate in metropolitan counties. 80.8% of greenhouse and nursery sales occur in Metro counties compared to only 19.2% of sales occurring in Non-Metro counties (**Fig. 1**).

Q2: Greenhouse and nursery sales are more predominant in AI counties. Twice as many greenhouse sales occur in AI counties vs. NAI counties.

Regionally it appears the top 10 counties for greenhouses farms and sales are almost all Metro-AI and with indications climate has an important role to play in location (**Table 2**).

Horse Sales

Table 4. Top Ten Counties with Horse Sales 2002				
State	County	Metro Status	Farms	
Kentucky	Fayette	Metro-AI	252	
Kentucky	Woodford	Metro-AI	178	
Kentucky	Bourbon	Metro-AI	154	
Florida	Marion	Metro-AI	911	
Kentucky	Jessamin	Metro-AI	91	
Kentucky	Scott	Metro-AI	107	
Pennsylvania	Chester	Metro-AI	205	
Virgina	Loudoun	Metro-AI	254	
Pennsylvania	Adam	NonMetro-AI	94	



Q1: Horse sales are concentrated in metropolitan counties. 74.2% of horse sales occur in Metro counties compared to only 25.8% of sales occurring in NonMetro counties (**Fig. 3**).

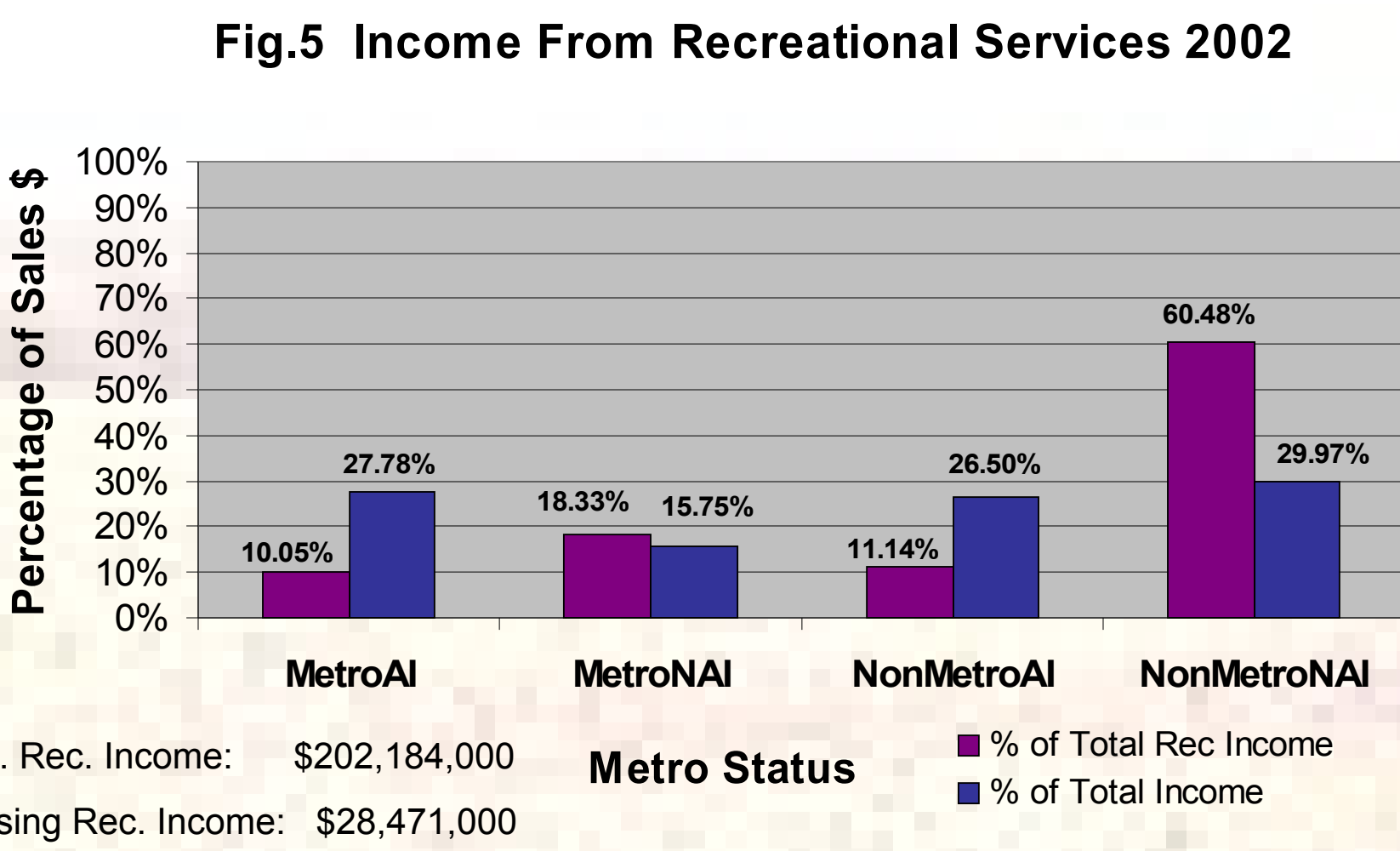
Q2: Horse sales tend to disproportionately occur in NAI counties compared to what would be expected with total sales.

Regionally the top 10 counties for horse sales are clustered in Kentucky (**Table 4**).

The top 10 counties for farms with horse sales include three counties (Lancaster - PA, Lagrange –IN, and Holmes-OH) with large Amish populations.

Income From Recreational Services

Table 6. Top Ten Counties with Income from Recreational Services 2002				
State	County	Metro Status	Farms	
Texas	Webb	NonMetro-NAI	568	
Texas	Vale Verde	NonMetro-NAI	285	
Texas	Edwards	NonMetro-NAI	349	
Texas	Uvalde	NonMetro-NAI	686	
Texas	Kimble	NonMetro-NAI	528	
Texas	Kerr	NonMetro-NAI	977	
Texas	Sutton	NonMetro-NAI	191	
Texas	Crockett	NonMetro-NAI	198	
Texas	Llano	NonMetro-NAI	692	
Texas	San Saba	NonMetro-NAI	706	



Q1: Income from recreational services is concentrated in NonMetro counties. 2.5 times more recreational sales occur in NonMetro counties compared to Metro (**Fig. 5**).

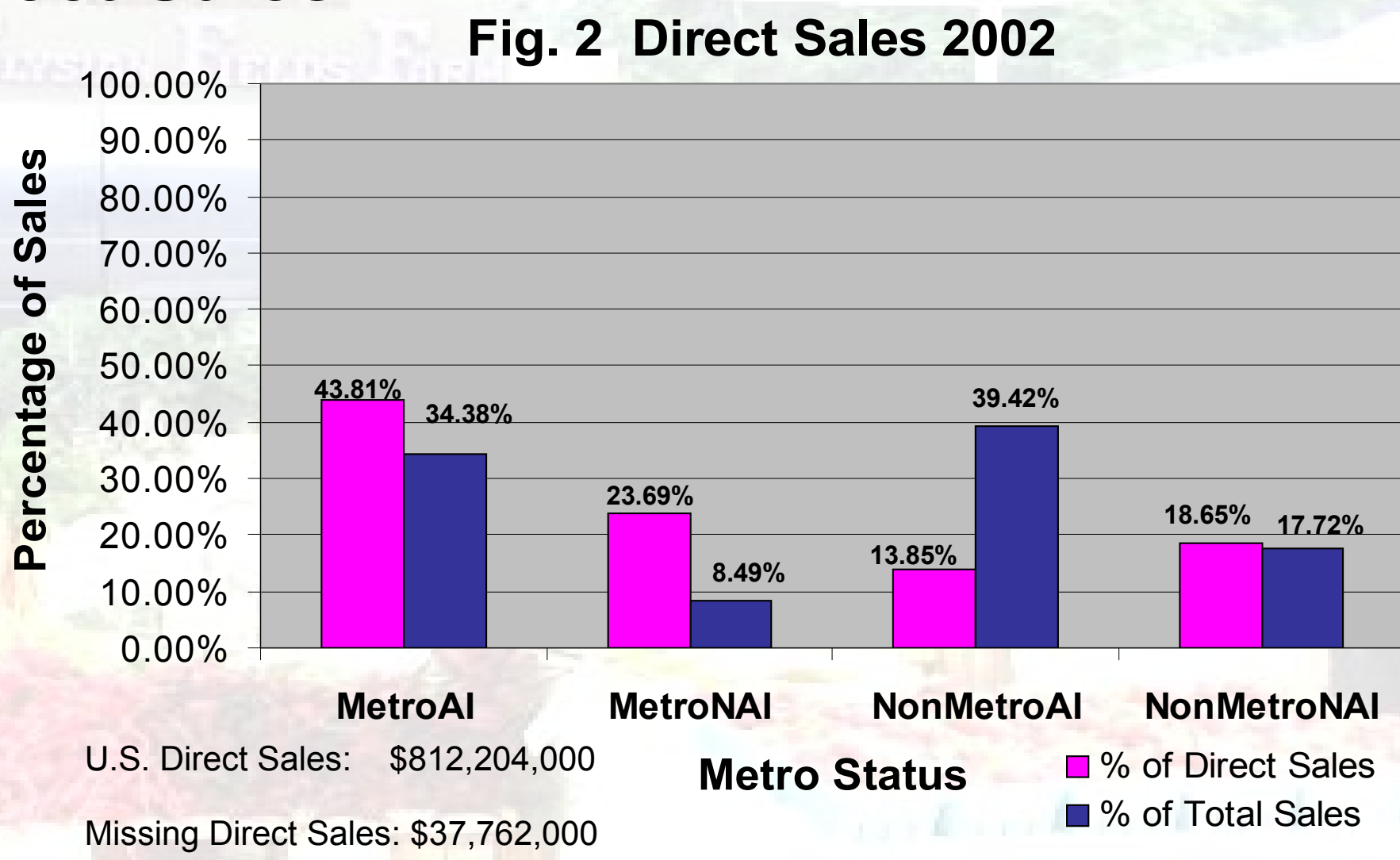
Q2: There is 3.5 times more sales generated in NAI counties compared to AI counties.

Recreational services can include agri-tainment but is more often associated with outdoor recreation (hunting, fishing, birding, and horseback riding). The top 10 counties for farms and sales with recreational services are all located in Texas and tend to be NonMetro-NAI counties (**Table 6**).

Abstract: Population growth and development at the rural urban interface (RUI) is creating challenges and opportunities for farmers. A standard thesis is that agriculture will steadily decline in the face of increased non-farm competition, but closer inspection reveals a more dynamic process of change. This poster describes the leading models for describing the structure of agriculture at the RUI and presents a bivariate analyses of Census of Agriculture data to assess the extent to which certain types of farm adaptations exist in proximity to large, urban areas. The aim of this research is to identify the relationship of urbanization and the structure of agriculture.

Direct Sales

Table 3. Top 10 Counties With Direct Sales 2002, Excluding California				
State	County	Metro Status	Farms	
Massachusetts	Worcester	Metro-AI	236	
Massachusetts	Middlesex	Metro-AI	157	
Pennsylvania	Lancaster	Metro-AI	537	
Connecticut	Hartford	Metro-AI	168	
New York	Ulster	Metro- NAI	115	
New York	Suffolk	Metro-AI	124	
Washington	Skagit	Metro-AI	165	
Connecticut	Fairfield	MetroN-AI	62	
Washington	Thurston	Metro-AI	191	
Colorado	Adams	Metro-AI	70	



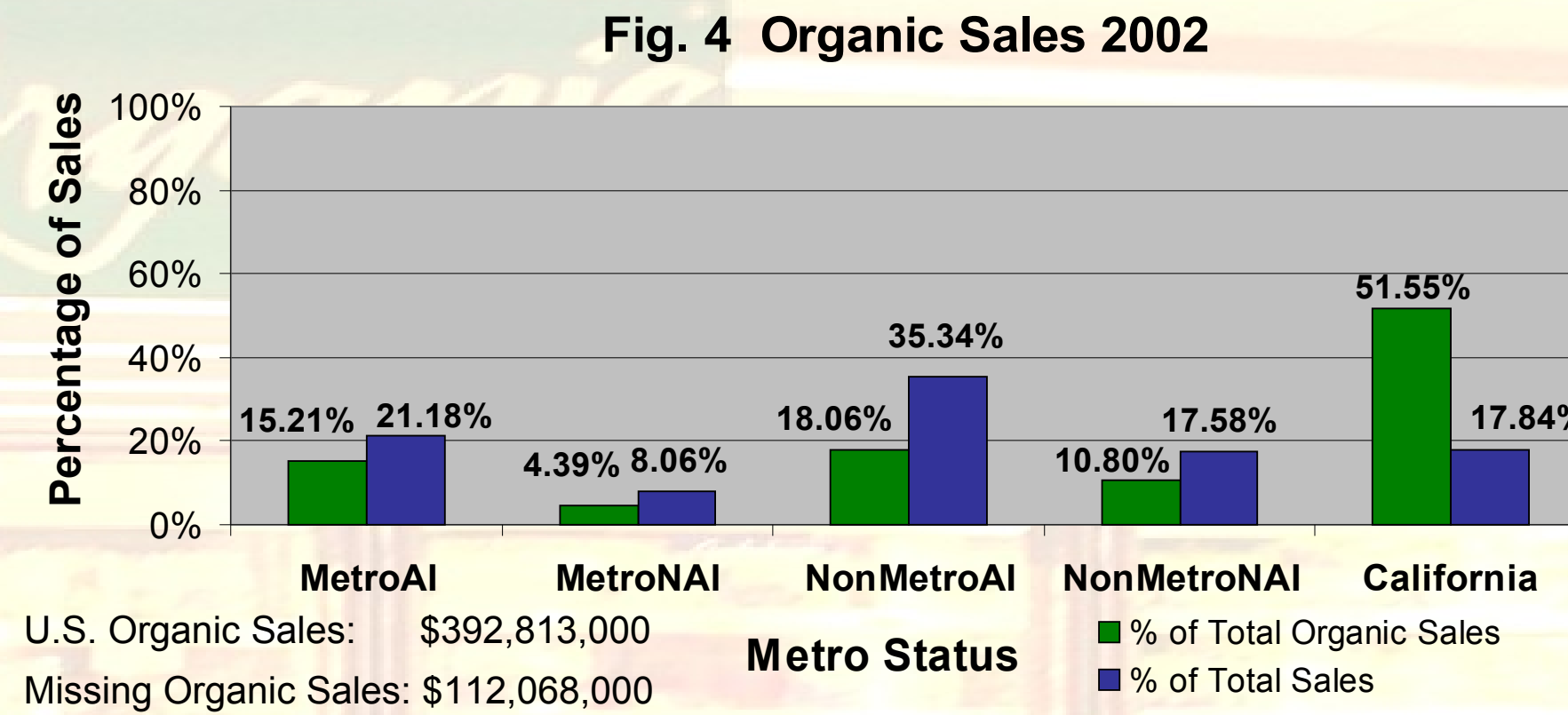
Q1: Direct sales do occur more frequently in metropolitan rather than nonmetropolitan counties. Fifty three percent of direct sales are in Metro counties (and when excluding California, it is 63%) (**Fig. 2**).

Q2: Although direct sales are greater in Metro-AI counties, 42.3% of direct sales are occurring in NAI counties.

Regionally California counties represented 8 of the top 10 farms with direct sales. When California is removed from the analysis direct sales tend to be most common in east coast counties (**Table 3**).

Organic Agriculture

Table 5. Top 10 Counties With Organic Sales 2002, Excluding California				
State	County	Metro Status	Farms	
Washington	Grant	NonMetro-AI	26	
Wisconsin	Vernon	NonMetro-AI	83	
Washington	Chelan	Metro-AI	27	
Washington	Yakima	Metro-AI	58	
Pennsylvania	Lancaster	Metro-AI	46	
Washington	Douglas	Metro-AI	26	
Florida	Dade	NonMetro-AI	36	
Arizona	Yuma	Metro-AI	12	
Iowa	Winneshiek	NonMetro-AI	16	
Vermont	Orange	NonMetro-NAI	14	



The concentration of U.S. organic production in California (51.5% of total U.S. organic sales), led us to treat California independent of our four categories.

Q1: Excluding California sales, 59.6% of sales occur in NonMetro counties compared to 40.4% in Metro. If California were included in the four category typology, organic production would appear to be a more Metro phenomena (**Fig.4**).

Q2: Organic sales are higher in AI counties when California is both included (84.5%) and excluded (68.7%).

The fact that NonMetro and AI counties stand out as the site of substantial organic production once controlling for the role of California, supports the industrialization of organic production thesis. Regionally the top 10 counties by sales and farms are dominated by California. Excluding California, the top counties reflect a greater geographical diversity that corresponds to the particular organic commodity (such as organic milk occurring in dairy regions) (**Table 5**).

Conclusions and Directions for Future Research

This analysis revealed strategies that have been generically labeled as “urban oriented” do not always occur most frequently in metropolitan areas. Direct sales, horse sales and greenhouse sales do correspond to indicators of urban oriented agriculture identified in the literature.

Although the majority of direct sales occurred in Metro counties a substantial portion of sales occurred in metro, NAI counties. High sales in these more marginal agricultural counties may provide future conditions for growth and agglomeration around direct sales in these settings. This trend may have relevance for those interested in building local food systems and maintaining agriculture at the RUI.

Organic sales are more concentrated in NonMetro and AI counties, perhaps reflecting its induction into the dominant commodity system structure. Recreational services, as measured by the Census, may be capturing income from agritainment that one might expect in more urban areas, but the real value from recreational services is clearly associated with outdoor recreation activities in nonmetro areas (particularly in the plains and Texas).

Future research investigating urban oriented agriculture may want to further assess the secondary data available for understanding the structure of agriculture to develop a more empirically grounded view of what types of agriculture are occurring at the RUI. Our initial assumption that organic agriculture and recreational services would be more prevalent at the RUI was proven false in this work, but direct sales, horse sales and greenhouse sales remain important features to further explore in assessing the strategies of farm adaptation at the RUI.

Acknowledgments: Special thanks to Jill Clark for context map and census data.

References: Berry, D. 1979. "Sensitivity of dairying to urbanization: a study of Northeast Illinois." *Professional Geographer*. 31:170-6.* Heimlich, R.E. and W.D. Anderson. 2001. "Development at the Urban Fringe and Beyond." *Agricultural Economic Report* No. 803. Washington DC: ERS, U.S.D.A.* Ilbery, B.W. 1985. *Agricultural Geography: A Social and Economic Analysis*. Oxford, UK: Oxford University Press.* Lapping, M.B. and M.J. Pfeffer. 1997. "City and Country: Forging New Connections through Agriculture." Pp. 91-104 in *Visions of American Agriculture*. Lockerez (ed.). Ames, IA: Iowa State University Press.* Lockerez. 1997. "City and Country: Forging New Connections through Agriculture." Pp. 1-31 in *Visions of American Agriculture*. Lockerez (ed.). Ames, IA: Iowa State University Press.* Lyson, Thomas A., and Judy Green. 1999. "The Agricultural Marketplace: A Framework for Sustaining Agriculture and Communities in the Northeast." *Journal of Sustainable Agriculture* 15 (2/3):133-150.* Sinclair, R. 1967. "Von Thunen and Urban Sprawl." *Annals of the Association of American Geographers*. 57: 72-87.* Thomas, J. K and F.M. Howell. 2003. "Metropolitan Proximity and U.S. Agricultural Productivity, 1978-1997." *Rural Sociology*. 68(3): 366-386.