



EXAMINING THE ANCIENT BATTLEGROUND WHERE URBAN BOUNDARIES TOUCH FARMLAND

This issue of INSIGHT demonstrates the strength of electronic communications. Rather than excerpted collections from important papers, we are able to present the entire paper for your information. The mission of the Thurmond Institute is to initiate conversation and promote movement on critical issues facing South Carolina, the Southeast and the Nation. The ideas presented in this electronic newsletter advance that mission.

The papers in this issue share a common thread of South Carolina's changing countryside and communities. The paper by Dr. James C. Hite prompts provocative questions about the sustainability of our agriculture interests and pressures on land for conversion to suburban expansion. It raises the serious question: are we planning for a future we wish or merely stumbling into a development pattern that no one wants?

The paper offered by Jeff Allen looks at the attitudes of rural South Carolinians toward a variety of agricultural practices. Developed as part of Clemson University's public service activities, the paper presents the preliminary findings by a cross-disciplinary team that consider the issues of public acceptance of various farming practices.

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FARMING IN THE SHADOW OF THE CITY: URBANIZATION AND THE CHANGING GEOGRAPHY OF SOUTHERN AGRICULTURE

BY JAMES C. HITE

IDENTIFYING ECONOMIC AND PUBLIC OPINION FORCES AFFECTING THE FUTURE OF ANIMAL AGRICULTURE IN SOUTH CAROLINA

BY JEFFREY S. ALLEN

FARMING IN THE SHADOW OF THE CITY: *URBANIZATION AND THE CHANGING GEOGRAPHY OF SOUTHERN AGRICULTURE*

By James C. Hite

As I sat by the fire one cold Tennessee night during this past Christmas, I saw on CNN a group of British farmers carrying signs: "Keep Britain Farming." And my mind recalled the occasional pictures on our TVs of French farmers protesting. I recalled, too, reading that German farmers are uneasy about their future in the new integrated European economy. It is very much an open question whether European farmers, especially western European farmers, are an endangered species.

In this country, there is a considerable movement concerned about the protection of farmland, if not farmers. An internet site devoted to protection of farmland contains a bibliography listing 570 titles, and the list is incomplete.¹ In 1982, the *International Regional Science Review* did a special issue on the subject, guest-edited by Peter Fisher, which is not included in that bibliography (Fisher, 1982; Simon and Sudman, 1982; Brown, Brewer, Boxley and Beale, 1982; Dillman and Cousins, 1982; Lapping and Forster, 1982). Currently, the South Carolina General Assembly has before it a 31-page bill entitled the "Farm and Forest Protection Act" that would empower local governments to buy development rights on farmland (Rich, 1998). The issue is clearly with us and is not about to go away.

The history of the South is that of an agricultural region. If the American South did not invent commercial agriculture, it certainly spawned the first large-scale manifestation of an economy based upon producing commodities (tobacco, rice, and cotton) for a global market, and the agriculture of producing staple commodities continued to dominate the economy of the South well up to

the middle of the present century.

The population of the South also remained largely rural well up to the middle of the present century. An agricultural South had minimal need for cities. Cities developed to service the export of the agricultural staples, and places like Charleston, Savannah, Mobile and New Orleans became significant urban centers. After the War Between the States, the growing railroad network spawned inland cities like Atlanta, and where natural resources were locally present, manufacturing cities like Birmingham and Chattanooga. Yet until the second half of the present century, none of these cities rivaled in size the big cities in other parts of the United States.

But the second half of the Twentieth Century has brought great change to the economic base of the South. The Southern economy diversified. The new nonagricultural economy had need for different kinds of urban places, some of them large urban centers; and farmers growing commodities on land near these growing cities found there was a ready market for land for nonagricultural uses that commanded considerably higher rents than could be gained from growing agricultural commodities. By 1992, the average price of farm land in every state of the South was higher than the national average. As new interstate highways and expanding ownership of motor vehicles enlarged urban zones horizontally, commodity agricultural is being driven to enclaves in the Southern hinterlands.

So it seems appropriate to look at the changing agricultural geography of the South. I will focus upon two states, South Carolina and Geor-

gia. I will use data from the Censuses of Agriculture and enterprise budgets developed by agricultural economics extension programs at Clemson and the University of Georgia to examine the changing geography of places where a farmer might expect to make a reasonable return on land growing the main commodities. Then I will discuss some of the ramifications for the farm economies in the two states and speculate about what the future may hold in store for the geography of farming in an urbanizing South.

II

Let me begin with some empirical analysis and examine the impact of urbanization on land prices and the potential for profitable production of the kinds of staple commodities that have been the mainstay of Southern agriculture since colonial times.

At least since the 1930s, agricultural economists have routinely been developing enterprise budgets for major agricultural activities. These budgets lay out and assign costs to the various variable and fixed inputs needed to achieve a given level of yield in specific types of farming regions. Some of the older enterprise budgets were based

on time and motion studies, but most today are based on the so-called “representative farm” model. Extension agricultural economists in almost every land-grant university maintain and update budgets keyed to the main farming regions and enterprises in the United States, and often today the budgets can be pulled down from the universities’ web pages.² Appendix A is an example of a rather typical contemporary enterprise budget.

For economic historians, the enterprise budgets are a valuable tool in that they allow one to estimate with reasonable accuracy the cost of production in various places at various points in time. In this paper, I have used budgets and prevailing commodity prices for three major Southern agricultural commodities — cotton, corn, and soybeans — to estimate the returns to risk, management, and land in South Carolina and Georgia around 1960 and in the 1990s. Those returns are shown in Table 1.

Deciding how much allowance should be made for risk and management is subjective. Arguably, risks for Southern commodity producers have increased from 1960 to the 1990s as a result of: a) reduction in support prices for cotton and corn, and b) greater variability in weather. The

Table 1. Estimated Returns to Land and Risks from Cotton, Corn and Soybean Budgets, Georgia and South Carolina, 1963-98.

State/Crop	1963-64	1997-98
Georgia:		
Cotton	\$67.31*/\$31.49**	\$153.68
Corn	8.43*/62.50**	48.40
Soybeans	NA	30.32
South Carolina:		
Cotton	\$28.16	\$96.66
Corn	23.27	76.00
Soybeans	25.09	58.32/73.68***

* Southeast Georgia

** Northwest Georgia

*** Second figure is total for soybeans double-cropped with wheat.

SOURCE: Calculated from Given and Shurley (1998); Hubbard, *et al* (1963); Perry, *et al* (1966); Worley, *et al* (1966); and Clemson Enterprise Budgets (1998).

opportunity costs on investments may have also increased. But, for the purposes at hand, great precision is not required. Using the estimated returns to risk, management and land shown in Table 1 as though they were returns to land alone, I have calculated the maximum market value of land that would allow an 8 percent return, assuming a zero return to risk. Those numbers are shown in Table 2. One could quibble over whether 8 percent is the right return to use in these calculation as one could quibble over ignoring the returns needed to get farmers to assume risk. Depending upon the outcome of those quibbles, one might end up with somewhat higher or lower numbers than those shown in Table 2. Accordingly, the estimates in Table 2 are intended to be only approximations, but reasonable approximations.

The Census of Agriculture reports the value of land and buildings by county, and hence it is possible to obtain a value of farm real estate per acre for agricultural census years. Note that the figure report is land buildings, and hence, a figure that is not directly comparable with the maximum crop land prices shown in Table 2. But if we ignore risk and management, interpreting the numbers in Table 2 as returns only to land, we will somewhat overestimate the return to land alone. And given that the Census real estate values overstate land prices, the imprecision in the numbers tends to be compensating. If we are willing to accept some imprecision in our analysis, we can use the estimates from Table 2 and the agricultural cen-

sus to identify counties in Georgia and South Carolina where land values are putatively too high to allow for profitable production of the main Southern commodities: cotton, corn, and soybeans.

Comparing the returns to land in the early 1960s with the farm real estate values reported in the 1959 agricultural census, we find that only one Georgia county (Cobb) had land values too high for cotton in 1959. Land prices were too high for corn in 16 counties, but only four [Bibb (Macon), Chatham (Savannah), Muscogee (Columbus), and Richmond (Augusta)] of those were counties with significant urban centers. There are a group of south Georgia counties that also stand out in Map 1 as places of relatively high land prices. The county seats of these counties are places like Baxley, Alma, Adel and Blackshear. So urbanization is not causing land prices to be too high for corn in parts of south Georgia in 1959. Instead, these are the counties of the Georgia tobacco and peanut belt, and the government price support programs for these two commodities introduce some distortions into the way land prices are distributed around the mean. There undoubtedly was considerable land in these south Georgia counties that could be purchased at prices attractive for production of corn in 1959; in fact, these counties, despite relatively low yields (and hence relatively low returns) accounted for about a fifth of Georgia's corn acreage in 1959.

The Georgia budgets reflect that south Georgia is not an area of high corn yields. Note

Table 2. Maximum Crop Land Prices Per Acre, Assuming Zero Return to Risk and Eight Percent Return to Land, Georgia and South Carolina, 1959 and 1992

Crop	Georgia		South Carolina	
	1963-64	1997-98	1963-64	1997-98
Cotton	\$841*/393**	\$1921	\$696	\$1208
Corn	105*/341**	605	304	950
Soybeans	NA	379	352	729/921***

* Southeast Georgia

** Northwest Georgia

*** Second value when soybeans are double-cropped with wheat.

that, in fact, the higher corn yields in north Georgia were sufficient to allow land prices in both Fulton and Dekalb counties at the very center of the soon-to-boom Atlanta to be hospitable to corn production in 1959. It is fair to say that commodity agriculture in Georgia in 1959 was not precluded by land prices but from a few relatively small urban counties.

Now examine Map 2. There were no counties in South Carolina where land values were too high for the potential of profitable cotton production, although values were too high for corn production in two counties (Horry and Marion) where the demand for land for tobacco had pushed up farm land values as in the tobacco/peanut belt counties of Georgia. Even allowing for a certain impreciseness in the numbers, it seems safe to say that in the late 1950s/early 1960s, the impact of urbanization on the land market had done little to reduce opportunities for continued traditional production of agricultural commodities in either Georgia or South Carolina.

Yet if we perform the same comparisons for the 1990s, the picture changes dramatically. By the time of the 1992 Census of Agriculture, land prices in 35 Georgia counties were too high for there to be much potential for profit growing cotton without irrigation, and in 15 counties even with irrigation (see Map 3). To be sure, these counties tend to be grouped in north Georgia where returns to cotton production have generally been lower than the rest of the state. Moreover, according to the Georgia budgets, there was not a single county in Georgia, not even in the most remote parts of south and middle Georgia, where land prices were low enough to be favorable for profitable production of non-irrigated corn or soybeans. Even if the budgets for irrigated corn and soybeans are used, 84 Georgia counties had average land prices too high for a representative farmer to make an 8 percent return on corn, and 102 had land prices too high for irrigated soybeans (see Map 4). In addition, increased land values in parts of south Georgia as well as down the Savannah Valley to Augusta have made commodity production a dubious economic proposition. By the 1990s, it is safe to say that, generally, land prices in all but a belt

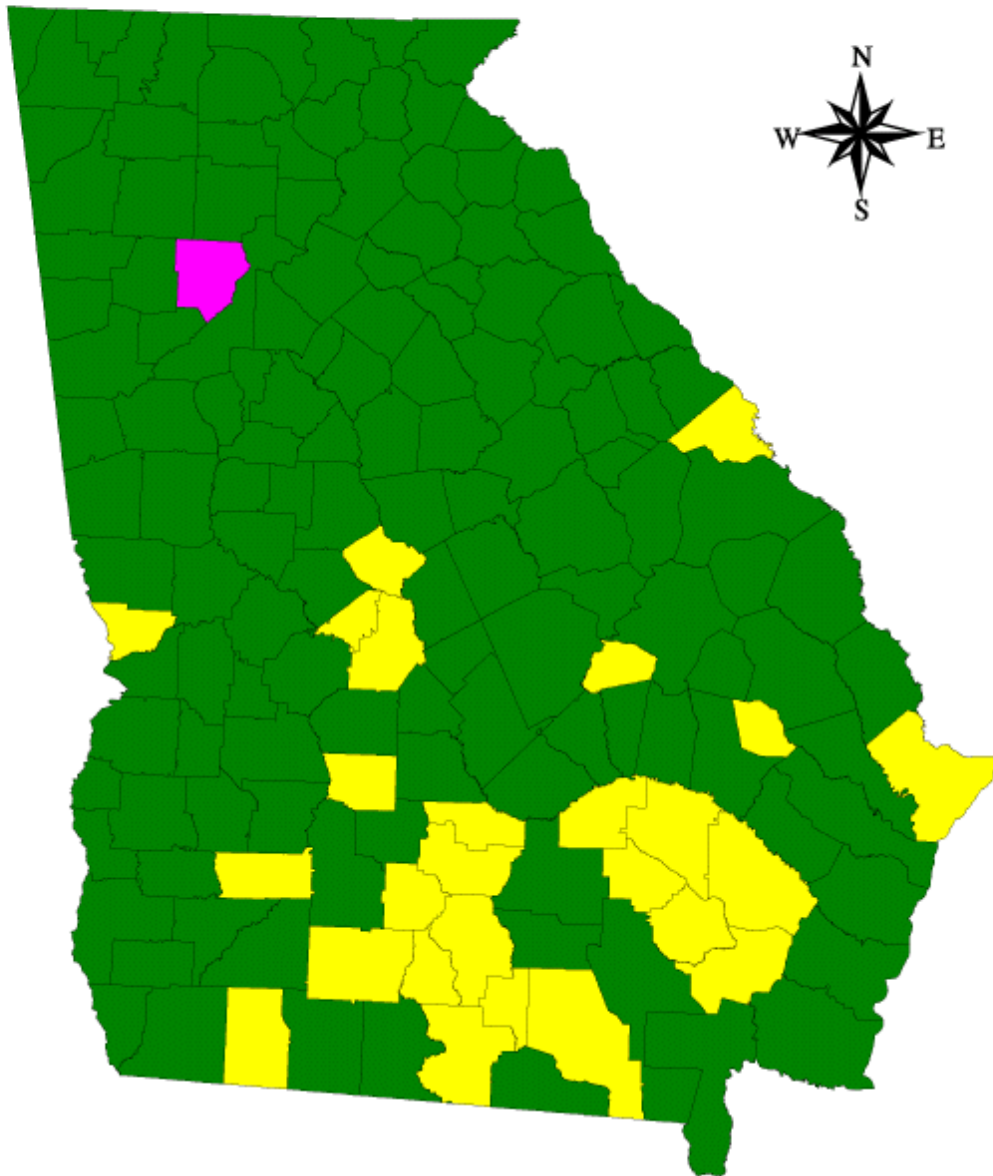
across middle Georgia make it difficult to realize a profit producing basic agricultural commodities.

The change is even more dramatic in South Carolina (see Map 5). South Carolina counties are larger than Georgia counties, and there is more heterogeneity in land prices within counties. But the counties in the northwestern part of the state, influenced by urbanization along I-85, have had large increases in rural land values and are now lost to cotton production. Similarly, counties where land values are being influenced by urban growth around Charlotte as well as those in the Columbia area are no longer attractive places for profitable cotton production. Although for reasons of soils and other factors, South Carolina's coastal counties were not major traditional cotton producers, the growth of tourism and retirement development along the coast has pushed land values beyond the range for profitable cotton production as well.

When the other major commodities — corn and soybeans — are considered, South Carolina is left in the 1990s with only four of its 46 counties where land values are unambiguously conducive to profitable commodity agriculture, and those are four of the state's smaller counties. All the of Piedmont of South Carolina is now lost to corn and soybeans. Tobacco continues to maintain a place in some of the counties in northeastern South Carolina, and double-cropping of soybeans with wheat has proven to be an effective response to higher land prices in some counties of the upper coastal plain (the belt of counties just below the Fall Line running southwesterly from Chesterfield to Barnwell). But the handwriting is on the wall: urbanization is driving South Carolina out of traditional commodity agriculture.

The impact of these rising land prices on production is indicated in Table 3. The counties where land prices are now too high to produce dry-land cotton accounted for about 11 percent of Georgia's cotton acreage in 1959, but nearly 21 percent of South Carolina's cotton acreage. By 1992, they accounted for none of Georgia's cotton acreage, and only about 3 percent of South Carolina's. Since land prices in all Georgia counties are now too high to produce either non-irrigated corn or soybeans, the counties lost account

Counties in Georgia where Average Land Prices were Too High for Major Commodities (Irrigated), 1992



- Counties with land prices too high for cotton (\$3088+ per acre)
- Counties with land prices too high for corn (\$905+ per acre)
- Counties with land prices too high for soybeans (\$874+ per acre)
- Counties without land price constraints for major commodities

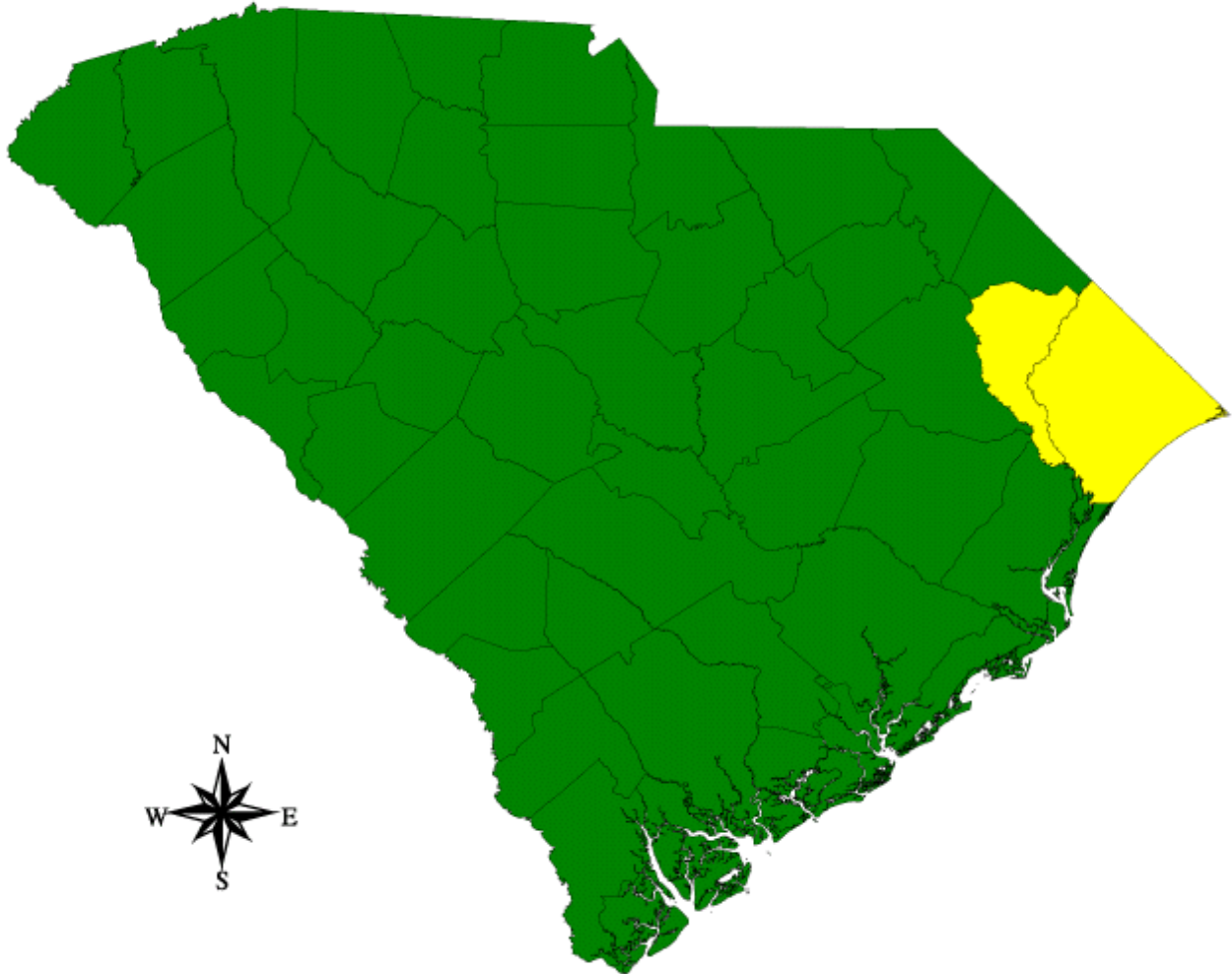
30 0 30 60 90 Miles

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Counties in South Carolina where Average Land Prices were Too High for Major Commodities, 1959



- Counties with land prices too high for cotton (\$696+ per acre)
- Counties with land prices too high for corn (\$352+ per acre)
- Counties with land prices too high for soybeans (\$304+ per acre)
- Counties without land price constraints

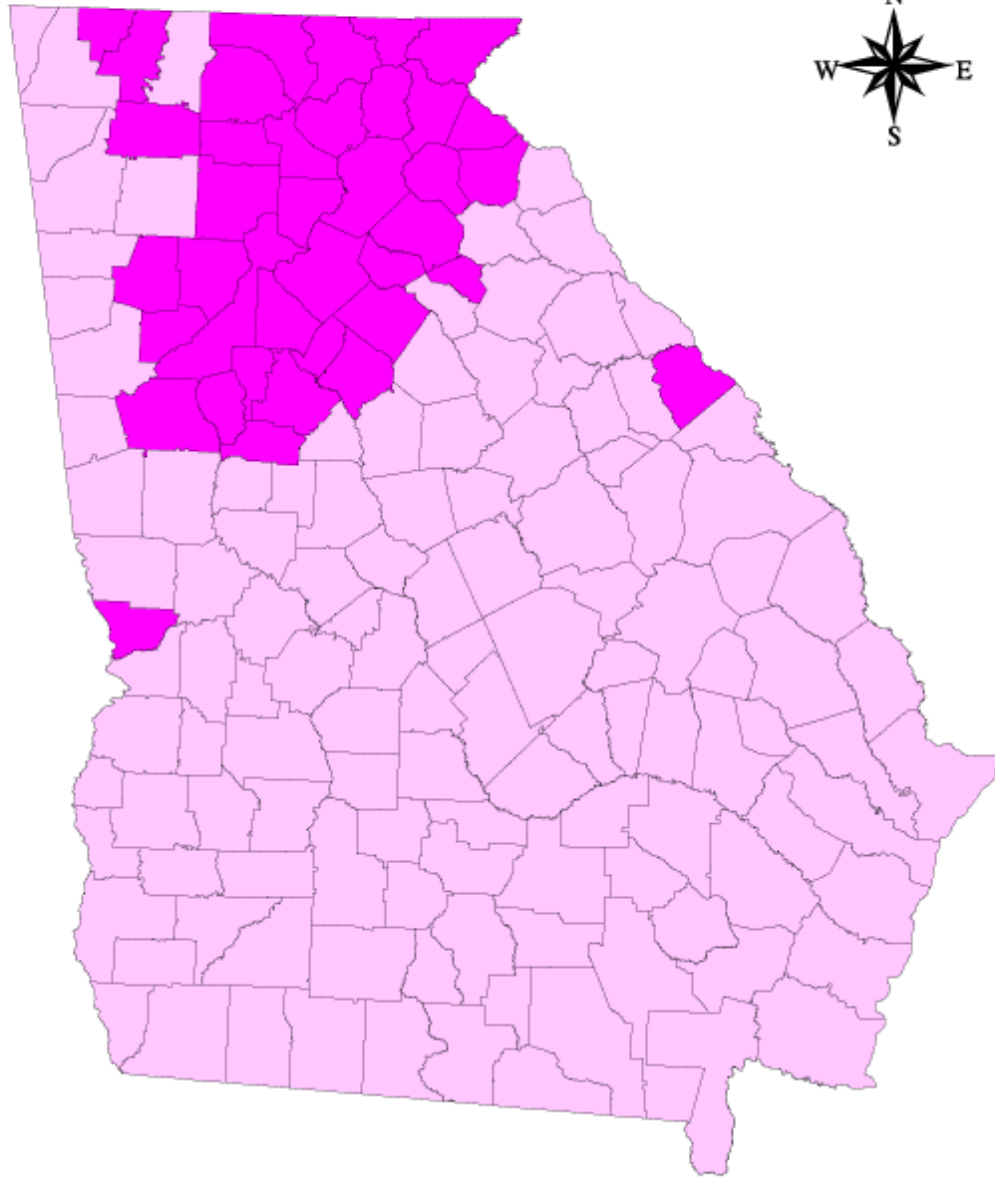
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25 0 25 50 75 Miles



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Counties with Average Land Prices Too High for Major Commodities(Non-Irrigated), Georgia,1992



- Counties with land prices too high for cotton (\$1767+ per acre)
- Counties with land prices too high for corn (\$338+ per acre)
- Counties with land prices too high for soybeans (\$52+ per acre)

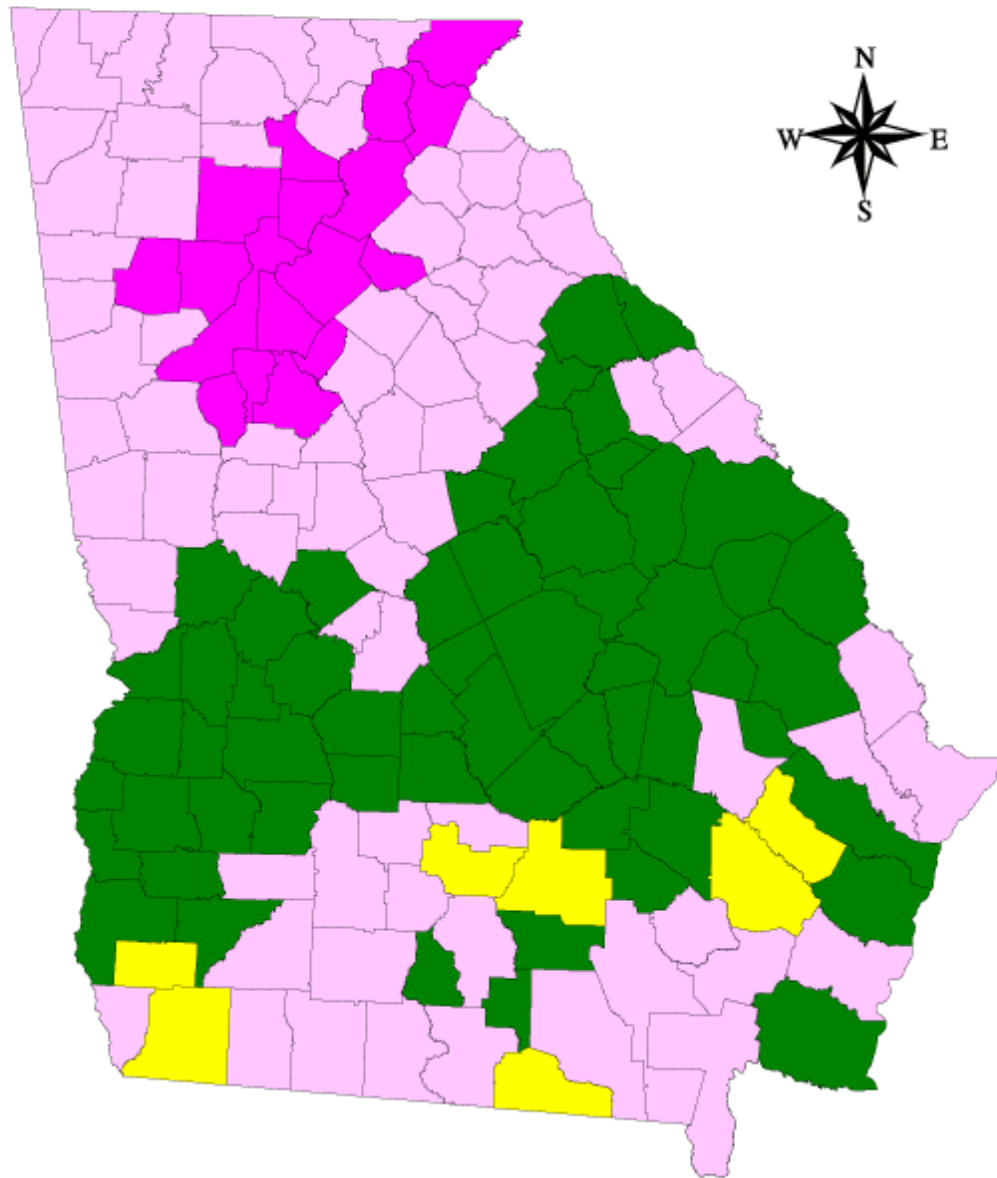
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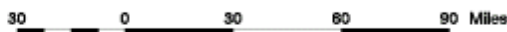
Spatial Analysis Laboratory, Strom Thurmond Institute, 4/18/1998

Counties in Georgia where Average Land Prices were Too High for Major Commodities (Irrigated), 1992

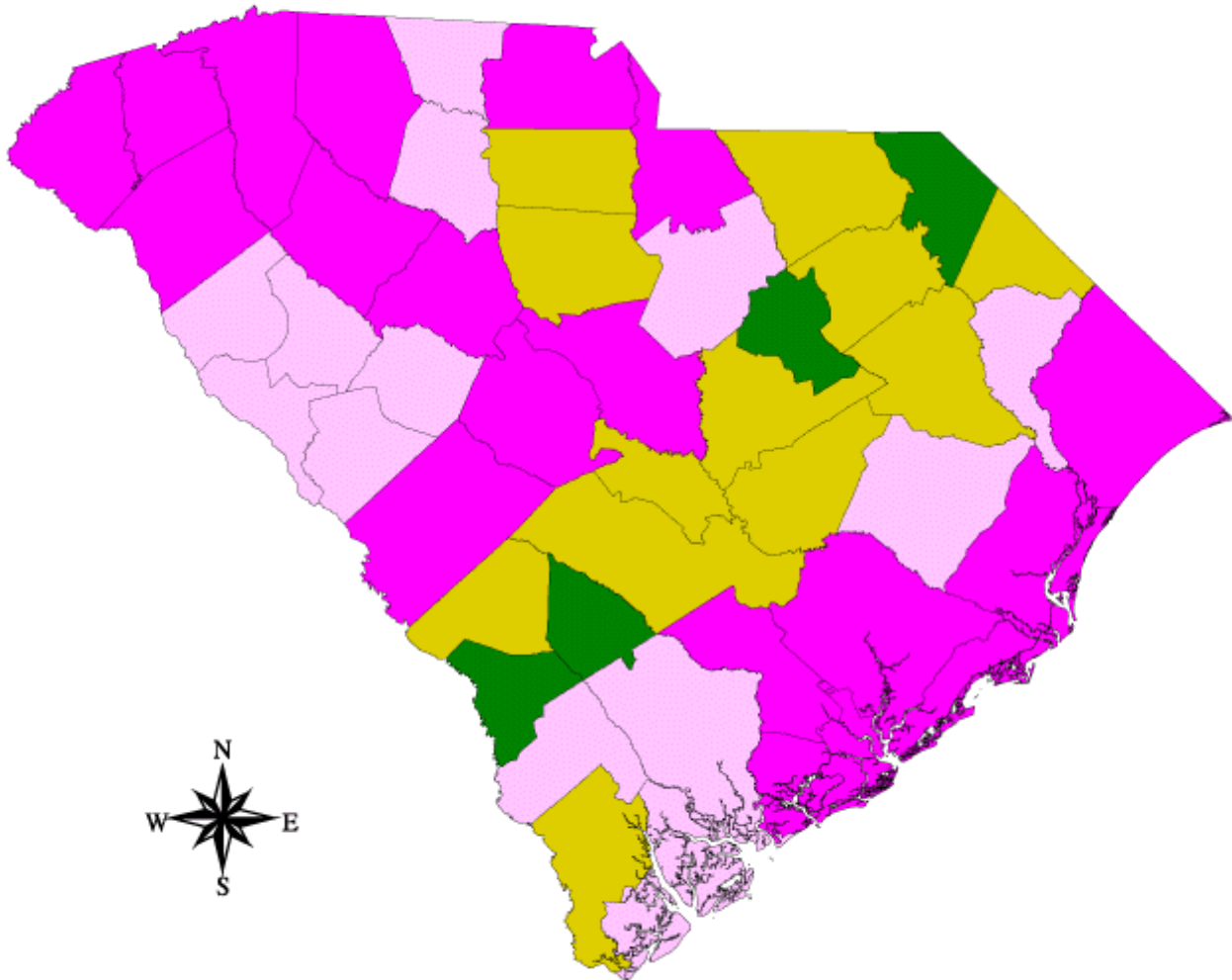


- Counties with land prices too high for cotton (\$3088+ per acre)
- Counties with land prices too high for corn (\$905+ per acre)
- Counties with land prices too high for soybeans (\$874+ per acre)
- Counties without land price constraints

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Counties in South Carolina where Average Land Prices were Too High for Major Commodities, 1992



- Counties with land prices too high for cotton (\$1208+ per acre)
- Counties with land prices too high for corn (\$950+ per acre)
- Counties with land prices too high for wheat/soybeans double-cropped (\$921+ per acre)
- Counties with land prices too high for soybeans (\$729+ per acre)
- Counties without land price restraints

25 0 25 50 75 Miles



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for 100 percent of corn and soybean production in both 1959 and 1992. The counties where land prices are too high for irrigated corn production accounted for 42 percent of Georgia's corn acreage in 1959 and 38 percent in 1992. Counties where average land prices are now too high for corn production accounted for almost 45 percent of South Carolina corn acreage in 1959 and 32 percent in 1992.

However, for at least three reasons, the impact of urbanization upon soybean acreage is more ambiguous. In the first place, soybeans were a relatively new crop in the South in the late 1950s and total acreage was relatively small in both **states**. Acreage has increased in both Georgia and South Carolina from 1959 to 1992. Secondly, soybeans have a relatively short growing season and lend themselves to double-cropping with small grain. Finally, soybeans have minimal labor requirements, and soybean production, like forestry, is sometimes a type of residual land use. Even so, returns to land from soybean production are low, and in 1992 there were no Georgia counties where an 8 percent return to land from growing non-irrigated soybeans appears to be in the cards. The South Carolina counties where average land prices make it economically non-feasible to produce soybeans in 1992 accounted for 76 percent of the acreage in 1959 and 86 percent in 1992 when the

double-cropping phenomenon is not taken into account. However, if the South Carolina counties in which land prices are still low enough to accommodate profitable double-cropping of wheat followed by soybeans are excluded, the acreage dropped from 76 percent to about 36 percent.

On the basis of the numbers above, it appears that soybean acreage has not been much affected by the increase in land prices. If the crop enterprise budgets are reasonably reflective of real world economics, soybeans are being grown in places where economic conditions are unfavorable. The question occurs: why? The most likely answer is that soybeans are being used to help offset some of the costs of holding land for speculation. A 1997 survey of Georgia farm landowners supports such an answer (Given, 1997). In that survey, farm land owners indicated expected annual increases in farm land values varying from a high of 10.7 percent in extreme southwest Georgia to 5 percent in coastal southeast Georgia. Hence, if land values are growing at 5 percent a year and one can earn a 3 percent or better return growing soybeans, the combined return to land is 8 percent or higher. But without soybean production, the returns to land drop below what one might reasonably hope to obtain from alternative investments.

III

Table 3. Percentage of Acreage of Major Crops Accounted for by Counties Where Land Prices Are Now Too High for Profitable Production, by Crop, Georgia and South Carolina, 1959 and 1992.

	1959	1992
Georgia		
Cotton	11.1%	0%
Corn	41.7 ^a	37.6 ^a
Soybeans	51.9 ^a	52.4 ^a
South Carolina		
Cotton	20.9	2.9
Corn	44.9	32.2
Soybeans	75.9	86.1*

^a irrigated

* 36.4 percent when counties where double-cropping of wheat followed by soybeans are accounted

Table 4. Prices of Selected Agricultural Commodities in Constant (1962) Dollars^a Georgia and South Carolina, 1962 and 1995.

State/Commodity	1962*	1995*
Georgia		
Cotton	\$0.32/lb	\$0.08/lb
Corn	1.28/bu	0.32/bu
Soybeans	2.34/bu	0.58/bu
South Carolina		
Cotton	0.34/lb	0.08/lb
Corn	1.31/bu	0.32/bu
Soybeans	2.44/bu	0.60/bu

^a. Prices deflated using the Producers Price Index.

* Source: *Agricultural Statistics*

The discussion above is premised upon the implicit assumption that all of the change in agricultural geography is driven by urbanization. That assumption must now be relaxed. Concurrently with the urbanization of the South, a general decline in the real prices of most agricultural commodities has occurred. Indeed, as shown in Table 4, if commodity prices are deflated by the Producers Price Index (PPI), the real prices of the commodities dropped by about 75 percent from 1962 to 1995. How much of that decline was due to increased on-farm productivity and how much due to the increased international competition arising from falling transport costs and lower trade barriers is a matter we might speculate about. Yet it is apparent that if the real prices of cotton, corn, and soybeans had not fallen over the last 30 years, producers of agricultural commodities in Georgia and South Carolina would have been able to return profits on at least some of the land where prices were being driven up by urbanization.

We can presume that the prices of cotton, corn, and soybeans kept pace with the rate of inflation measured by the PPI and recalculate the estimates of maximum land prices for 1995 shown in Table 2. If, at the same time, the gain in yields obtained from 1959 to 1992 had occurred, there would have been no loss of farm land; indeed, the counties where land prices were too high in 1959

would have been recaptured for production. Yet one reason for the decline in real commodity prices is that increased productivity indicated by the increased per-acre yields. If we assume that yields per acre did not increase and the prices of these cotton, corn, and soybeans had remained constant in real terms, south Georgia farmers could have had hopes of profits on cotton land worth as much as \$3434 per acre in 1995, and north Georgia corn farmers on land worth as much as \$3188 per acre. Similarly, South Carolina farmers could have realized positive returns to land and risk on cotton land worth as much as \$1436, on corn land worth as much as \$1187 per acre, and on soybean land worth as much as \$1280 per acre.

Even so, Georgia would have lost 22 mostly north Georgia counties to profitable cotton production accounting for about eight percent of Georgia's 1959 cotton acreage, although loss of cotton acreage would have been about the same. Georgia would have lost 40 counties to profitable corn production accounting for about 13 percent of 1959 corn acreage rather than all her counties accounting for one hundred percent of 1959 acreage, and 41 counties to profitable soybean production accounting for about 3.5 percent of Georgia's 1959 soybean acreage rather than all of her counties.

Even if the prices of cotton, corn, and soybeans had kept up with the PPI, South Carolina

would have lost 12 counties to cotton production because of higher land prices, accounting for about 15 percent of its 1959 cotton acreage, compared to 16 counties accounting for 21 percent of 1959 acreage. South Carolina would have lost 19 counties to corn production, accounting for about 32 percent of 1959 acreage rather than 27 counties accounting for 45 percent of acreage, and 14 counties to soybean production accounting for 8 percent of 1959 soybean acreage instead of 43 counties accounting for 76 percent of 1959 acreage.

It seems fair to say, therefore, that not all of the changes in agricultural geography in Georgia and South Carolina during the past 30 years or so are due to urbanization. Declining real commodity prices have played an important role, especially with regard to soybeans. But urbanization played the major role, especially with regard to the changing geography of cotton and corn production, and especially in South Carolina.

The differences in Georgia and South Carolina seem more closely tied to the specific urban geography of the two states. Even 30 years ago, Atlanta was the leading city in Georgia, but it was not substantially larger than Savannah, Macon or Augusta. Most of the urban growth in Georgia, however, has been concentrated in the Atlanta area, and hence, the impact of urbanization on farm land prices has been contained, more or less, to the northern third of the state where agricultural commodity production was on a small scale and of limited commercial significance. Consequently, urbanization has been relatively less important in its impact on Georgia commodity production. South Carolina cities are smaller than Atlanta, but there has been substantial urban growth around Greenville-Spartanburg in the upstate, around Columbia in the midlands, and around Charleston on the coast. Moreover, spillover urbanization from border cities like Charlotte and Augusta has affected farm land prices in South Carolina. Thus, the impact of urbanization on South Carolina agriculture has been geographically more pervasive and has affected counties that historically were significant producers of agricultural commodities. The result is that urbanization, even in the absence of a

decline in the real price of agricultural commodities, has had a relatively large impact on farming in South Carolina.

IV

What does all this suggest about the future of agriculture in the economy of an urbanizing South? Is there a future for farming in the shadow of growing Southern cities?

The analysis above is part of work in progress. The enterprise budgets are stereotypes. Some farms are more efficient and can profitably survive on higher-cost land than suggested by the budgets. Soils matter, and we have not taken them into account, a refinement that can be done using average county yields to adjust the estimated returns to land for individual counties. Earlier, we noted that our allowances for risk and management are arbitrary. The maps we produced are sensitive to changes in commodity prices and interest rates. Further refinement is in order, and one appropriately should be very cautious in drawing broad generalizations from what we have in front of us. Yet, none of these things are likely to do much but cause a few counties to be reclassified. The overall pattern of change in Southern agricultural geography must surely resemble in general outline what we see in Maps 1-5. What we see is broadly consistent with received theory in economics, geography and regional science.

The bag of theory that every regional scientist carries as part of our intellectual luggage suggest that producers of staple commodities for markets at a distance will be threatened by rising land costs triggered by exogenous forces, and especially when the production processes require significantly large land inputs. Southern agriculture traditionally has been about the production of just such commodities, and the impact of an exogenous urbanization could be expected to have produced the kinds of change in Southern agricultural geography that have, in fact, occurred during the last 30 years.

The influence of urbanization on farm land values is to raise production cost. In the case of tradable agricultural commodities, it is to put lo-

cal producers at a cost disadvantage relative to producers in the hinterlands where urban demand for land is not a significant factor in influencing land prices. Unless transport costs are relatively high, that land cost disadvantage is apt to be decisive. And there have been dramatic reductions in transport cost, particularly ocean-going transport, in recent years (Peters, 1989). Hence, it seems unlikely that farmers will be able profitably to grow staple commodities for world markets in the shadows of the South's growing urban centers.

To be sure, some farmers are still trying to grow these crops in urbanizing parts of the South. Land represents a fixed cost, and asset fixity will assure that some such production continues well after the time when land prices make it unprofitable. There is also evidence, as noted above in regards to soybeans, that commodity production may continue as a way of offsetting the carrying costs of speculating in land. A 4 percent return to land from producing commodities combined with a 4 percent annual appreciation in land values will also produce an 8 percent return on land, and there is evidence that many farmers (and farm landowners) expect relatively high appreciation in land values.

But in counties within a 100 miles or so of major metropolitan centers, the prospects for continued production of staple agricultural commodities very far into the twenty-first century seem poor. The opportunity costs are just too high, and there is little evidence that neither farmers, nor society (through the purchase of development rights) are willing to accept those costs. Using the 1992 Agricultural Census market values for farmland and buildings, the cost of purchasing development rights for farmland in South Carolina would amount to \$677 million. Amortized over 30 years at 5 percent, this sum would require an annual outlay of about \$44 million, an outlay that is not implausible, but significantly higher than willingness-to-pay surveys would suggest the public is willing to accept (Bergstrom, Dillman and Stoll, 1985; Beasley, Workman and Williams, 1986; Ready Berger and Blomquist, 1997).

There are some exceptions to that general-

ized assessment. Interestingly, it is cotton, the most traditional of all the Southern agricultural commodities, that appears to have the greatest ability to survive in the face of urban influences on land prices (since the returns to land from cotton production are relatively high). So it may be possible to continue making a profit from cotton production on land in the shadow of Southern cities if the land is particularly fertile and productive. If one crosses the Mississippi River at Memphis and heads west across the rich Arkansas bottoms one will see cotton presently being cultivated almost in the shadows of the city of Memphis, and because those Mississippi bottoms are so rich and are on a floodplain where building is very risky, that land may still be growing cotton for some time.

Yet the conclusion seems inevitable: commodity agriculture is not compatible with urbanization. Once commodity agriculture has declined to some level in a region, the infrastructure needed to support that type of agriculture collapses and will also disappear. Every cotton producer needs to be within a reasonable distance of a gin, and if there are no gins close by, few farmers will likely start growing cotton again. "Once lost/forever lost" might be a bit strong because forever is an infinitely long time. Yet it is unlikely that public policy can reestablish a commodity agriculture once it has been squeezed out by urbanization. The subsidies required would be enormous. Tara's cottonfields on the south side of Atlanta really are "gone with the wind," and Atlantans who want to see ripening cotton in the field will probably not find it any closer than south of Macon.

Yet that does not mean that urbanization is incompatible with all type of agriculture. It seems reasonable to assume there will always be some local demand for fresh produce in every city, and a willingness and ability on the part of some segment of consumers in the city to pay a premium price to satisfy such demand. That creates a niche for local producers, and for the survival of a niche-based agriculture that economizes on high-priced land. How big that niche will be depends upon the size of the city and the income of urban dwellers.

One example of such a niche might be

growing sweet corn for the local market. Let's take the Clemson enterprise budget sweet corn included in Appendix A. If one assumes that it might be possible to command a premium price of \$3 a dozen for such corn in direct to consumer sales, the return to land would justify paying as much as \$26,000 per acre for farm land. Three dollars a dozen is a high price, but not beyond reach for a truly high-quality sweet corn harvested fresh. And even if one halves the price the market will bear for fresh sweet corn, one can reasonably hope make an 8 percent return on land worth \$7278 per acre.

The niche for fresh sweet corn may not be very large, but it will almost always be there. Niches may be relatively large and numerous near major regional metropolises where there is an affluent population with a taste for fresh local produce. None of the niches may be very large in middle-sized provincial cities, but several of them will almost always be there waiting to potentially be filled by entrepreneurs in market-garden agriculture. Where such niches exist, the struggle for survival in the marketplace will create a very high probability they eventually will be filled. As transport costs decline, the number of niches will shrink. Yet since there is very little chance that transport costs will ever be zero, this hypothesis basically suggests that farming is not likely to disappear entirely in any region, even a highly urbanized one.

We do not have to look hard to see examples of such niche farming surviving in urbanized regions. The best example in the United States, perhaps, is in New England where market-garden agriculture continues to survive, and in some cases, prosper. Some of us remember the advice which Massachusetts Governor Michael Dukakis gave hard-pressed Iowa grain farmers in the 1988 Iowa primary: grow Belgian endive. That advice did not go down very well in Iowa, and probably was not appropriate for Iowa. But coming from Massachusetts, it is understandable that Dukakis would have offered it. Growing Belgian endive is a strategy for survival for farmers in Massachusetts that works.

The farms that survive in an urbanized region do not produce for markets at a distance. They

produce for the high-end of the local market. Such production requires nimble management and skill in reading markets that are quantitatively different from the management and marketing skills required to run big row-crop commodity production operations. Not all farmers have the requisite managerial abilities. And there may not be room in the local market for many Belgian endive producers, sweet corn growers, herb producers, honey producers, or any other specific product. But the key to survival is producing a product, not a commodity, and part of being a producer of products is establishing customer loyalty to a good of a particular type from a particular source. Successful market-garden entrepreneurs will find niches, occupy them and expand like lichen using a crack to split a rock.

V

Perhaps this paper should not end without some comment on public policy implications of the analysis above. Broadly speaking, there are three possible strategies for dealing with the effects of urbanization on farmland: 1) do nothing and let history unfold as it will, 2) intervene and try to save farmland, or 3) facilitate adjustments.

Although the first strategy may be the preferred one, at least for free-market economists, there will be considerable political pressure in many places to do something proactive. Intervening to try to save farmland, however, is apt to be a very expensive proposition. The establishment of land trusts to receive and hold voluntary donations of development rights can facilitate action by some philanthropic rural landowners who have special interests in conservation of farmland. Unless compensation is provided, it is probably unrealistic to expect that large numbers of landowners on the rural/urban fringe will voluntarily forgo realizing the rather large gains in wealth that can be had from developing their land. The sums that would be required are not beyond the fiscal capacities of any Southern state. Nevertheless, the studies cited above that have attempted to measure the willingness to pay for protection of farmland indicate that there is inadequate support for laying out public money at the realistic levels that would be required

to purchase a substantial portion of the development rights for endangered farm land. Half-funded buy-outs of development rights for farmland mean some farmers get bought out and others do not. Unless public attitudes shift and cause substantially increased willingness to pay to preserve farm land, schemes to buy up development rights will have to withstand political pressures to focus buy-out schemes in ways that benefit the politically well-connected and such schemes have considerable potential to fall prey to a rent-seeking frenzy, if not out-and-out corruption.

At least for the present, the option of intervening to try to save farm land does not appear to be feasible, at least not with regard to saving anything other than small remnants of land traditionally used to produce staple agricultural commodities through philanthropic gestures like land trusts. Buy-out schemes like those being considered in South Carolina have potential to waste large amounts of tax dollars without making much difference in the patterns of urban development, and a worrisome potential to increase political corruption.

That leaves the third option — facilitating adjustment by the farm sector to urbanization. As we have noted above, urbanization opens up opportunities for market-garden agriculture while closing out opportunities for profitable production of staple commodities. Public policy that improves marketing opportunities for fresh, locally-grown produce can, at the margin, help facilitate the adjustment and do so at relatively low costs. Refocusing agricultural research and Extension programs better to meet the needs of a market-garden agriculture could also be helpful. Rethinking how we educate agricultural students in Southern land-grant universities so as to produce nimble, market-savvy farmers/entrepreneurs might also contribute to the adjustment. But in the end, these things will probably only facilitate an adjustment process that is likely to occur anyway, and they will not, or cannot, assure continued existence of large expanses of open-country, whether just green space or working farmland, in the shadow of the cities.

If there is a political need to do something proactive, the adjustment strategy seems clearly the most promising. Programs that facilitate adjustment have the great advantage of working with historical processes, rather than against them. At the margin, such a strategy might shape the details of outcomes, reduce transaction costs and improve general quality of life. So a policy strategy of facilitating the adjustment of Southern agriculture to new geographic realities is probably the only proactive option with any probability of achieving some (limited) success.

Whether such a strategy beats a resolute laissez faire option is at least debatable, and needs debating. But that debate turns on philosophic values that run beyond the writ of regional science, and about which I manifestly have no license to preach.

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JCH

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APPENDIX A

<http://cherokee.agecon.clemson.edu/crnlomkt.pdf>

APPENDIX B

Calculations on Land Costs and Commodity Production

Break even with zero return to risk and management, 8% return on land

I. 1963 South Carolina

Budget Data: J. W. Hubbard, T. A. Burch, and

C. P. Butler. 1963. "Estimated Production Requirements and Returns from Selected Crop and Livestock Enterprises in the Upper Coastal Plain Area." Dept. of Agric. Econ & Rural Soc. SC Agric Ext Station in coop with Farm Production Economics Div, ERS, USDA. AE 243
Soybeans: 32 bus/acre at \$2/bus.

Land Price Max is \$352/acre

Corn: 60bus/acre at \$1.23/bus

Land Price Max is \$304/acre

Cotton: 600lbs lint @\$0.31/lb; .51tons/acre of seed at \$40/ton

Land Price Max: \$696/acre

1963 Piedmont

Budget Data: Charles P. Butler and Thomas A. Birch. 1960. "Production Requirements and Estimated Returns from Selected Crop and Livestock Enterprises in the Piedmont Area." as above. AE 202 Oct 1960.

Soybeans: 25bus/ace @ \$2/bus

Land Price Max: \$252/acre

Corn: 50bus/acre @\$1.23/bus

Land Price Max: \$160/acre

Cotton: 500lbslint@\$0.323/lb; 850lbs seed @\$0.017/lb

Land Price Max: \$878/acre

II. 1997 South Carolina

Wheat Followed by Soybeans: 50bu/aces wheat @ \$3.88/bus; 30bu.acre soybeans@ \$6.20/bu.

Land Price Max: \$921/acre

Soybeans: 35bus/acre @\$6.20/bus

Land Price Max: \$729

Corn: 100bus/acre @ \$3.12/bu

Land Price Max: \$950/acre

Cotton: 650lbs lint @ \$0.73/lb; 1253lbs seed @ \$0.05/lb

Land Price Max: \$1208/acre

III. 1963 Georgia

Southeast Georgia

Budget Data: C. E. Perry, O. L. Brooks, and F. B. Saunders. 1966. *An Analysis of Costs and Returns for Crops and Livestock Enterprises, 1963-65, at the Southeast Georgia Branch Experiment Station.* Ga. Agric. Expt. Station,

Univ. of Ga. Athens, Mimeo Series N.S. 254.

Cotton: 550 lbs lint @ \$0.32/lb; 1000lbs seed @ \$0.025/lb.

Land Price Max: \$841/acre

Corn: 38 bus/acre @ \$1.25/bu.

Land Price Max: \$143/acre

Northwest Georgia

Budget Data: E. E. Worley, D. D. Hayes, H. L.

Dorton, and F. B. Saunders. 1966. *An Analysis of Costs and Returns for Crops and livestock Enterprises, 1963-65, at the Northwest Georgia Branch Experiment Station.* Ga. Agric. Expt.

Station, Univ. of Ga., Athens, Mimeo Series N.S. 255.

Cotton: 554 lbs lint @ \$0.31/lb; 880 lbs seed @ \$0.023/lb.

Land Price Max: \$394/acre

Corn: 50 bus/acre @ \$1.25/bu.

Land Price Max: \$314/acre

IV. 1998 Georgia

Budget Data: William Given and Don Shurley.

1998. *Crop Enterprise Cost Analysis, South Georgia, 1998.* Cooperative Extension Serv.

Agricultural and Applied Economics, Univ. of Ga., Athens.

Dryland Cotton: 650lbs lint @ \$0.73/lb; 1253 lbs seed @ \$0.05/lb.

Land Price Max: \$1767/acre

Dryland Corn: 75bus/acre @ \$3.50/bu

Land Price Max: \$338/acre

Dryland Soybeans: 30 bus @ \$6.50/bu.

Land Price Max: \$52/acre

Irrigated Cotton: 1000 lbs lint @ \$0.73/lb; 1500 seed at \$0.05/lb.

Land Price Max: \$3088/acre

Irrigated Corn: 150 bus @ \$3.50/bu.

Land Price Max: \$905

Irrigated Soybeans: 58bus @ \$6.25/bu.

Land Price Max: \$874/acre

¹ <http://farm.fic.niu.edu/fic/home.html>

² <http://cherokee.agecon.clemson.edu/budgets.htm>

Identifying Economic and Public Opinion Forces Affecting the Future of Animal Agriculture

By Jeffrey S. Allen

Income from animal agriculture in South Carolina has lagged behind that in neighboring states. In order to make rational decisions about the trade-offs between the expansion of animal agriculture and regulation of animal agriculture, policy makers need more information about public opinions, about the proximity of current animal operations to human populations and watersheds and about the potential problems of animal agriculture and their solutions. Through the Agricultural Productivity & Profitability Competitive Grants (2x4 Program), a multidisciplinary team has come together to assemble information related to these concerns. The team consists of: Mellie L. Warner, Ag and Applied Economics; Jeffrey S. Allen, South Carolina Water Resources Center at STI; Harold M. Harris, Jr., Ag and Applied Economics; Catherine Mobley, Sociology; Brenda J. Vander Mey, Sociology; Peter Skewes, Animal and Veterinary Science; Christopher M. Sieverdes, Ag and Applied Economics.

The scope of the project is focused on three areas. First, primary data on public opinions of animal agriculture in South Carolina has been obtained through a phone survey of approximately 700 randomly chosen citizens. Second, other spatial data sources are being assembled and analyzed regarding the locations and scope of existing animal agriculture operations relative to human populations and watersheds. These will be presented visually using GIS mapping through the Spatial Analysis Laboratory at the Strom Thurmond Institute. Finally, a publication titled "Fact Book on Animal Agriculture in S.C." will be published. Conferences in Orangeburg and Florence will be held to highlight results.

Preliminary results from the first 167 respondents of the phone survey show a general acceptance of animal agriculture operations. Almost all (91 percent) indicated that the preserva-

tion of open spaces is important. Even more (97.6 percent) thought that family farms should be preserved. Most (74.9 percent) thought that most animal agriculture operations were working hard to reduce their environmental impacts while 90.9 percent of respondents said that animal agriculture is important in their county of residence, and three-fourths said that they would support more animal agriculture in their counties. However, 62.3 percent of respondents agreed that we need tougher environmental regulations around animal agriculture; 43.1 percent felt that animal agriculture raises ethical questions about the treatment of animals; 41.9 percent agreed that animal agriculture causes environmental harm; 32.39 percent said they have personally been bothered by the odor of animal agriculture; and 34.19 percent indicated that animal agriculture has negative effects on property values. Only 16.2 percent indicated that animal agriculture had reduced their quality of life.

When asked about the three most pressing problems in their counties, respondents most frequently mentioned crime (33.5 percent), drugs (33.5 percent) and "other" (44.9 percent). "Other" included race relations, untrained labor, lack of industry, small towns/communities breaking down, inadequate services such as trash pickup, and family breakdown. Interestingly, pollution or other environmental problems from agriculture or manufacturing were rarely mentioned.

It is hoped that when all of the data is assembled and analyzed that the resulting information will assist policymakers and South Carolina citizens in making informed decisions about the expansion and/or further regulation of animal agriculture in the state.

Jeffrey S. Allen is Research Coordinator at the Strom Thurmond Institute and Director of the Water Resources Center.

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