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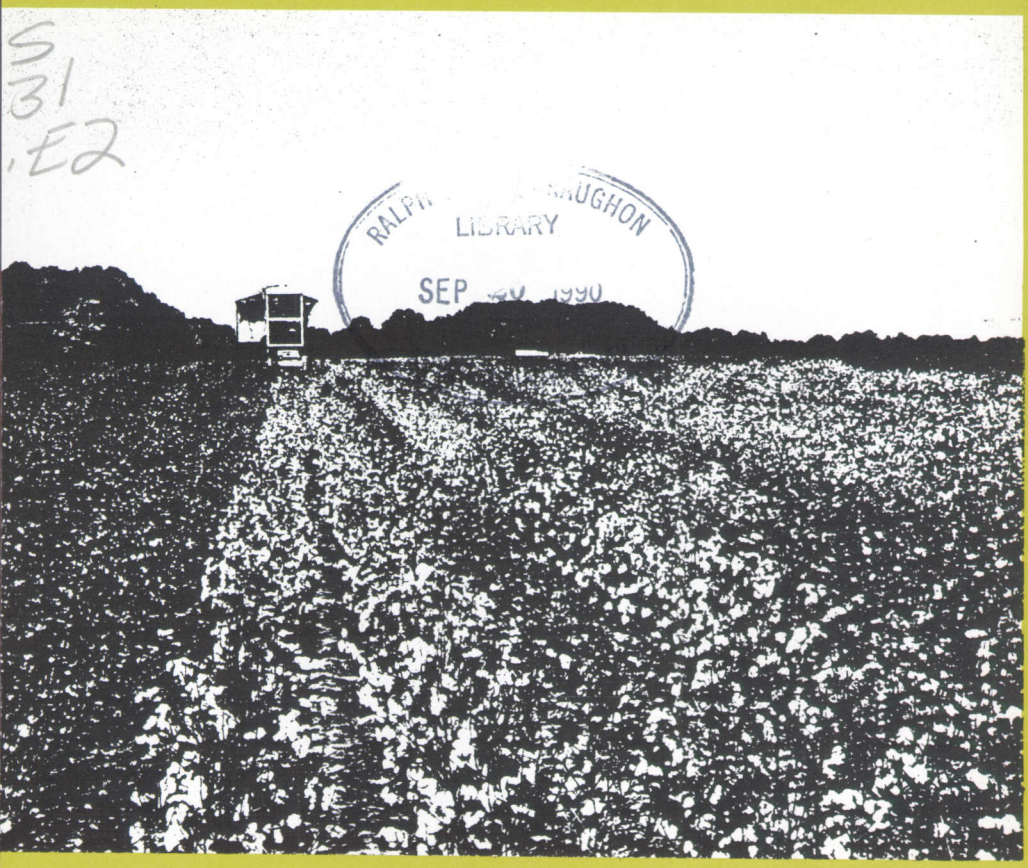
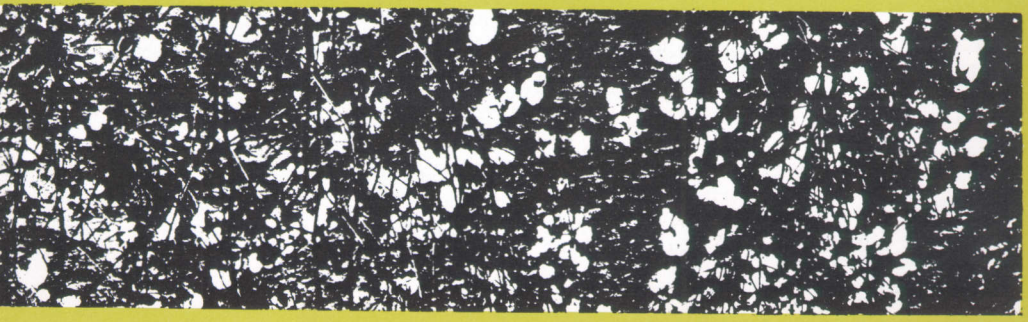


An Analysis of the Rural Land Market in the Limestone Soil Region of Alabama



AGRICULTURAL EXPERIMENT STATION
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CONTENTS

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An Analysis of the Rural Land Market in the Limestone Soil Region of Alabama*

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INTRODUCTION

RURAL REAL ESTATE has exhibited high rates of appreciation in value in recent years. Between 1970 and 1978, the national average farm real estate value jumped from $195 to $490 per acre, a 151 percent increase (*10*). In the last 4 years the increase was 62 percent. Between February 1977 and February 1978, value per acre went up 9 percent.

Although the appreciation rate has been less for Alabama than that reported for the United States, average value of farm real estate in Alabama more than doubled between 1970 and 1978, going from $200 to $452 per acre (*10*). The last 4 years had a 37 percent boost in value per acre while the state increase between February 1977 and February 1978 amounted to 5 percent.

The largest recent increases in value occurred in the United States and Alabama between March 1973 and March 1974—25 and 27 percent, respectively. These large increases have generated interest in the rural land market among investors. In fact, increases in the value of farm real estate have been greater than those for many forms of investment.

There are some indications that increases in land values are easing. The perennial upward trend of Midwest farmland prices is leveling off, indicating that tougher economic circumstances are making farmers reluctant to expand their oper-

*This study was conducted under Hatch Project Alabama 397, supported by State and Federal funds.

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ations. USDA reports that the rate of increase in farmland values nationally slowed in 1977, and in some cases actually declined in the last half of the year *(10)*. These recent decreases in the rate of value appreciation would probably be short-lived, however, if agricultural income and the general economic climate improved.

DESCRIPTION OF STUDY

Diversification of agriculture in Alabama primarily results from differences in physical, biological, economic, and institutional characteristics specific to particular areas of the State. Variation and interaction of these characteristics affect the rural land market. Analysis of the rural land market should focus on areas with similar characteristics. Since soil type has a major influence on agricultural production, study areas could be selected on major soil classifications. The study reported here is concerned with rural land in the Limestone Soil Region of north Alabama.

Study Area

The Limestone Region is so named because its soils were derived from limestone. This region is a geological area which includes major portions of about 11 counties in north Alabama. The area is characterized by fertile, deep, well-drained, brownish loamy soils, most of which are located on upland with some slope *(4)*.

The Limestone Soil Region is concentrated in the Tennessee and Limestone Valley areas of the State. The Tennessee Valley, located in the Tennessee River basin in the extreme northern counties of Alabama, has high soil fertility and intensive agriculture. The Limestone Valley consists of a series of limestone valleys of moderate width lying between wooded hills and ridges, generally along the Coosa River basin. This area is somewhat more broken and has a higher altitude, longer growing season, more variability in soil texture, and slightly lower yields for particular crops than the Tennessee Valley *(6)*.

In terms of cash receipts, major land-intensive agricultural commodities in this region in 1977 were: cattle and calves, $46,930,000; soybeans, $44,422,000; and cotton, $42,473,000 *(1)*. Other important agricultural products and their cash receipts were: broilers, $83,446,000; hogs, $44,646,000, and

eggs, $44,313,000. Counties in this region had total cash receipts from all commodities of $319,655,000 in 1977. This comprised 21 percent of the State's total cash receipts from all farm commodities.

The Tennessee and Coosa rivers are navigable rivers in this region. Other sources of water are also present, such as creeks, streams, reservoirs, and lakes. Reservoirs in the Tennessee Valley are Wheeler, Pickwick, Wilson, and Guntersville. Reservoirs in the Limestone Valley or Coosa River basin include Neely Henry, Logan Martin, and Weiss lakes. The combination of State and private parks with these water sources provides a major source of recreation for the area.

Justification for Study

The value of U. S. farm real estate climbed 16 percent in 1977, totaling nearly a half-billion dollars, more than double what it was 5 years earlier *(2)*. These value increases reflect changes in demand and supply that have occurred in the region. Demand for rural real estate has intensified due to population growth, technological advances, government policy, increased leisure time, larger disposable income, and speculation. The non-agricultural sector has had an increasingly important impact on the rural land market.

On the supply side of the market, acres of U. S. farmland declined from 1,183 million in 1959 to 1,081 million in 1977, an 8.6 percent change *(9)*. The Southeast and Alabama experienced similar changes for the same period. Total acreage in farms in the Southeast and Alabama declined 11.9 and 12.1 percent, to 53.3 and 14.5 million acres, respectively *(10)*.

In all sectors of the economy, information on the rural land market would be useful. Public and private (farm and nonfarm) decision-making relative to land use could benefit from availability of this information. Availability and use of such information provides an opportunity for the market system to function more efficiently. Potential buyers in the public and private sectors could use this information in determining the sale price per acre and future land-use policy for a particular location or area. Such information also would help property owners evaluate their assets. The changing structure of the rural land market has increased the need for this type of information.

A major portion of the variation in rural real estate value can

be attributed to a few identifiable factors. These factors may or may not be agriculturally related. It is not possible to identify or classify all of the factors affecting the market as totally agricultural or non-agricultural. The relative effects, individual or joint, on rural land value may be inferred from economic and related theory and estimated by mathematical and statistical techniques. Isolation of the relative impacts of the selected variables affecting rural land value could aid appraisers, financers, sellers, and buyers in evaluation of property values.

The Limestone Valley Region of north Alabama is an important agricultural region of the State. Its continued development for agricultural, industrial, residential, and recreational uses would benefit the State's economy. Decisions by public and private sectors require continuous knowledge of the rural land market. A study to provide this information for the Limestone Valley Region of Alabama was needed to show the relative impact of agricultural and non-agricultural factors which influence the rural land market.

OBJECTIVES AND PROCEDURES

The general objective of this study was to analyze the structure of the rural land market in the Limestone Soil Region of Alabama. Specifically, the study was designed to determine the significance and relative impact of factors which affect rural real estate value. Agricultural and non-agricultural factors were analyzed to determine their relative importance. Characteristics of buyers and sellers of rural land in the Limestone Valley region were summarized and included in the analysis.

This study considered only rural land, that is, real property located outside city limits. Omitted were all transactions involving tracts of less than 10 acres and transactions which were trades, foreclosures, tax sales, sales among relatives, or sales transacted under compulsion. Land in special use categories, such as rural highways, railroads, airports, parks, wildlife refuges, national defense areas, flood control projects, and national forests, also was excluded.

A listing of qualified land transactions taking place between January 1977 and June 1977 in the Limestone Region of Alabama was obtained from deed records of the 11 counties in the region. From this listing, a stratified random sample of small

(10-50 acres), medium (51-125 acres), and large (126 acres or more) tracts was selected in proportion to their frequency of occurrence in the listing, figure 1. Seventy-six transactions were selected.

Personal interviews with buyers and sellers were conducted to collect data on such physical characteristics as tract size, acres of cropland, acres of timber, acres of pasture, and presence of water in the form of ponds, lakes, or streams. Other

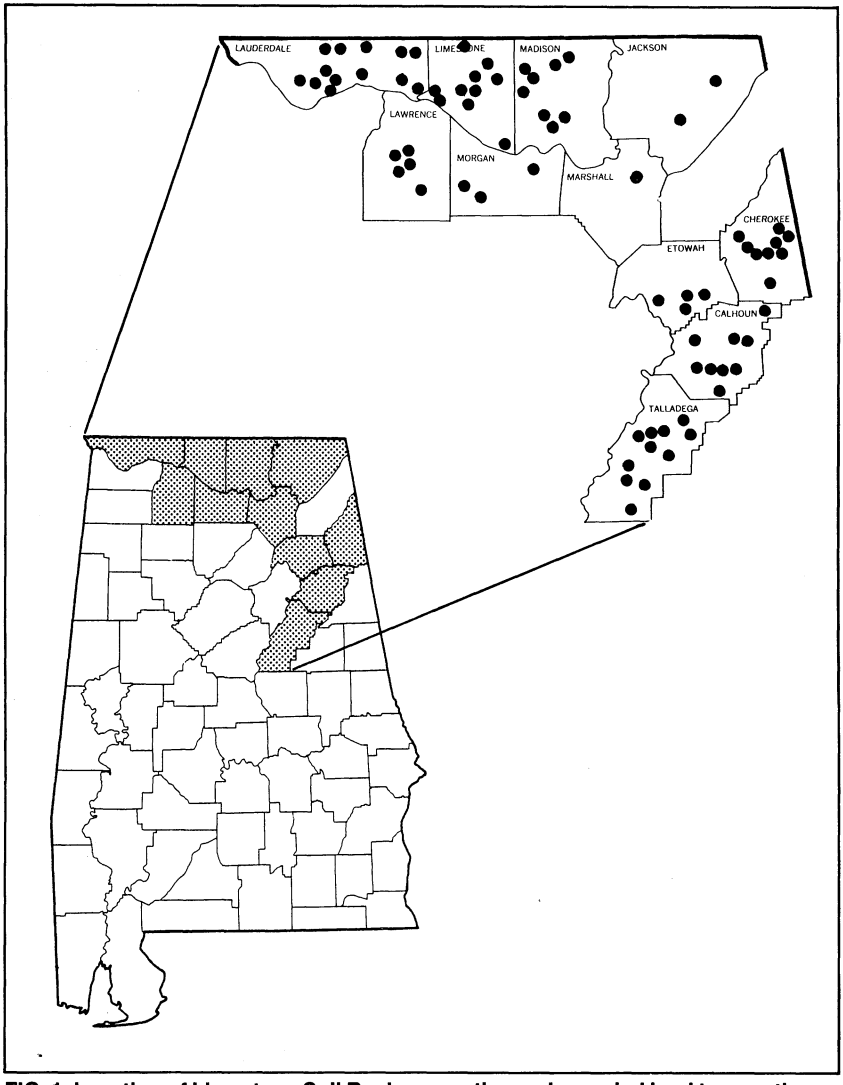

FIG. 1. Location of Limestone Soil Region counties and sampled land transactions.

physical relationships, such as distances to particular areas, major population centers, railroad access, navigable river access, stockyards, cotton gins, grain elevators, and airports, were obtained from county maps. Personal information, such as age, education, family income, percent income from farming, and reason for purchasing the tract, was obtained from buyers and sellers by personal interview. Also collected were data pertaining to county tax mill rate, percent of population classified as urban, number of farms, and average per capita income per farm for each county.

Some of the factors considered for the econometric model were: tract size, distance to major cities, distance to major river access, distance to state park, distance to railroad loading point, water frontage, road frontage, value of improvements, percent of openland, reason for purchase, type of ownership and sale, sources of financing, and buyer and seller age and occupation. Multiple regression analysis was used to determine the factors which had a significant impact on rural real estate value. Standard significance tests were used.

Characteristics of buyers and sellers were identified to provide a profile of parties involved in land transfers in the Limestone Soil Region of Alabama. Using this profile, along with data on the relative magnitude and significance of the above mentioned factors, structural components of the rural land market were determined.

ECONOMIC FRAMEWORK

Market value of farm real estate is determined by the interaction of supply and demand. Thus, an understanding of the factors which contribute to variations in supply and demand is necessary to understand the rural land market. The supply of land in the short run is fixed and relatively inelastic; that is, there is insufficient time to reclaim land from wasteland or to transfer land from one use to another. Since the short-run supply of land is relatively fixed, demand factors are important contributors to variation in rural land values. The theoretical influences of these factors are discussed in the following sections.

Location

Land is fixed in location and found at varying distances from centers of economic activity. Costs are involved in transferring

the output from rural land to markets and in bringing labor, capital, and other inputs to land. Therefore, location plays a significant role in determining economic uses made of land and in affecting the rent and value attached to its use.

As distance to population and industrial centers increases, the number of alternative uses for a tract of land decreases. This results in reduced competition for land and lower values. In contrast, rural land near centers of economic activity has strong demand for residential and industrial uses and thus would command higher values.

Distance from agricultural processing and marketing facilities influences the value of farm land by affecting transportation costs and production and marketing feasibility of alternative enterprises. Net farm income would decrease as transportation costs increase. Also, the availability of market outlets for certain products could affect the feasibility of purchasing a particular tract of land. A tract near a desirable marketing facility would be more valuable than a tract farther away.

Proximity to recreational areas also influences the value of land. Recreational areas attract people who demand food, lodging, and other services, which increases demand for land and boosts its value. Also, the recent upsurge in the desire of city dwellers to live in rural areas has affected rural land values.

Distance from various types and qualities of transportation routes would have an inverse relationship with the value of a particular tract of land. Accessibility to an interstate highway would be worth more than being near a dirt road. Location near a railroad could be beneficial for an industrial site and detrimental for a residence. Nearness to other transportation facilities, such as a navigable river or an airport, would tend to increase the value of land. Accessibility due to road frontage would be expected to increase value of the land. All of these factors would influence the value of land through transportation costs and convenience or inconvenience.

Population density (people per square mile) was expected to affect rural real estate value. In densely populated areas there is a strong demand for rural land due to the presence of more potential buyers in the local market. Demand also increases for land when there is a need for residential projects, shopping centers, and recreational facilities. Population den-

sity was expected to have a positive or direct relationship with rural land value.

Physical Characteristics

Physical characteristics are attributes of the land which will affect its use and value. These characteristics are below the surface, part of the surface, or attached to the land surface. Physical characteristics considered in this study were land use and soil classifications, topographic features, mineral deposits, improvements, and the availability of water sources.

Land use classifications include cropland, pastureland, woodland, idleland, and wasteland. Cropland and pastureland classifications, which indicate openland uses, were expected to have a positive effect on rural land value relative to other agricultural land uses. This is due to the productivity and income potential of cropland and pastureland.

Presence of water resources, a pond and/or streams, was expected to have a positive influence on rural land value. This feature increases potential uses for rural land, such as livestock watering, irrigation, fish production, and possible recreational aspects.

Improvements are man-made structures which are fixed to the land. Presence of houses, barns, fences, and other outbuildings was expected to have an effect on the value of rural land. As value of improvements increases, value of land was also expected to increase. However, improvements may detract from value when they are not functional.

Availability of a community water line was expected to have a direct influence on the value of rural land because it increases the number of alternative uses for the land. Residential development would be enhanced by the known presence and constant supply of water, especially in an urban fringe area.

Sales Characteristics

Sales variables are the characteristics a particular tract of land possesses which make it attractive or unattractive to potential buyers. Sales variables include tract size, distance to property from present residence of the buyer and of the seller, buyer's reason for purchase, type of sale, down payment, taxes, and financing terms.

As tract size increases, so does the initial investment or money outlay for purchase. Large financial expenditures limit some potential buyers in the market due to the financial constraint. High value uses of land, such as residential and/or industrial development, require less land than do farming and other lower value uses. Thus, smaller tracts of land were expected to command a higher value per acre than larger tracts.

Tax levels were expected to affect the value of rural land. Taxes on a parcel are based on the market value, assessment rate, millage rate, and the number of acres. High taxes result in higher annual costs to landowners, thus reducing net annual income. For this reason, increased taxes were expected to have a negative effect on the value of rural land. However, taxes have traditionally had little impact on land value in Alabama because of prevailing low property tax levels.

Distance that a buyer and/or seller lives from the transferred tract was expected to influence value. If a tract of land was adjoining property owned or leased by the buyer, then the buyer's desire to own the sale tract was expected to increase. On the other hand, tracts sold by a seller who lives or has lived on it for some lengthy period probably would bring a higher price because sentimental value would make the seller less willing to dispose of the property. To sell the property, the owner must be offered a price above the going market value or be in an unfavorable position relative to the market.

The buyer's reason for obtaining a given tract of land was expected to influence value. If the buyer's reason for purchase was for industrial, residential, or recreational uses, value was expected to be greater than if the land was purchased for agricultural uses. Farming may result in a relative negative impact on land value because it is possibly a lower use based on potential income producing capability than higher valued land uses.

Type of sale (by owner or broker) was expected to influence the final sale price for land. Brokers are usually better informed and knowledgeable of the land market and are generally in contact with more potential buyers than the owner. Thus, sale by a broker was expected to have a positive influence on land value relative to the owner negotiating the transaction. However, a portion of this higher price will be a monetary commission for the broker. Regardless of type of sale, the

negotiated sales price for the tract of land will be only what the market will generate.

Down payment and financing terms were other factors expected to affect value of rural real estate. Low down payments enable more potential buyers to enter the market, thereby increasing demand for land because of the attractiveness of the low initial investment or money outlay. Low down payments were expected to have a positive effect on land value.

Favorable financial conditions for the buyer could result in a higher price. A lower interest rate and lower down payment usually occur when the seller finances the transaction. The seller has a comparative advantage over financing agencies, such as the Federal Land Bank, Farmers Home Administration, local banks, and other financial institutions. The seller receives the principle and interest over a pre-determined time period. A small down payment could be required, which could result in a lower tax liability for the seller and less initial money capital for the buyer.

Buyers also have the option of paying cash for land. However, cash transactions are generally limited to the smaller tracts because of the large money outlay required.

Type of Ownership Variables

Four types of ownership were considered in this study: individual, partnership, corporation, and estate. Because estates were not expected to buy land, they were considered only as sellers.

Financial resources of the potential buyer would be expected to influence the value of rural real estate. Since financial resources increase with the number of persons who buy a unit, corporations and partnerships would be in better financial position to bid a higher price for land relative to individuals. However, corporations or partnerships would not be so inclined without market pressure. Due to these divergent impacts, no hypothesis was made concerning the effect of different types of buyers on value.

A tract of land may be sold by any of the four types of owners considered in the study. Ownership of land by an estate results from the death of the original owner. For the most part, heirs may lack knowledge of the property value, are often not interested in maintaining the property, and/or may live at great distances from the property. An estate is sold for the purpose of

dividing it among heirs. Thus, the sales price received was expected to be lower for estate sales than with sales by individuals, partnerships, or corporations. This is a market transaction, but it is more of a forced type of sale.

RESULTS

Analyses of data gathered in the study are reported under three headings, dealing with: (1) characteristics of rural land transfers and the participants in these transfers; (2) a model explaining variations in rural real estate value in the Limestone Soil Region; and (3) example data that illustrate the value and use of the model.

General Characteristics

The average tract of land sold in the Limestone Soil Region survey was almost 56 acres, table 1. Openland (cropland and pastureland) averaged 50 percent of each tract with timberland, idleland, wasteland, or pond acreage comprising the balance. Forty-four percent of the parcels had a pond or stream on the property and 41 percent had a community water line. Twenty-eight percent of the transfers had an occupied dwelling present. Road frontage was present on 88 percent of the transactions—66 percent on paved roads and 22 percent on non-paved roads.

Distance from the property to a creek or stream averaged less than 1 mile, while the average distance to a navigable river was 14 miles. Average distance to an area of at least 25,000 population was 20 miles. Average distances of the transferred tracts from other facilities or resources that affected value were: interstate access points and four-lane highways, 18 and 11 miles, respectively; stockyards, grain elevators, and cotton gins, 14, 10, and 7 miles; and recreational facilities, such as parks, national forests, and campgrounds, 27, 34, and 42 miles, respectively. Average county population density in this region was 104 people per square mile.

Sales price per acre of farmland averaged $1,077, table 2. This included an average of $365 per acre for total improvements—$31 for farm improvement value and $334 for residential improvement value. Forty-one percent of the sample had no improvements on the property while 28 percent had only farm improvements. Of those parcels having im-

TABLE 1. PHYSICAL CHARACTERISTICS OF RURAL LAND TRANSFERS IN THE LIMESTONE REGION OF ALABAMA, 1977

Physical characteristics	Unit	Average[1]	Low	High	Average[2]
Size	acres	56	10	270	
Cropland	acres	16	0	160	24
Pastureland	acres	13	0	126	26
Idleland	acres	6	0	160	34
Wasteland	acres	1	0	4	4
Woodland	acres	19	0	269	34
Pond	acres	1	0	17	4
Stream	miles	1	0	20	2
Tracts with community water present	percent	41			
Tracts with water	percent	44			
Tracts with road frontage	percent	88			
Paved	percent	66			
Non-paved	percent	22			
Tracts with dwellings	percent	28			
Open land per tract	percent	50			
Distance to nearest population center of					
5,000	miles	6	0.5	20	
10,000	miles	14	1	33	
25,000	miles	20	3	46	
50,000	miles	28	4	60	
100,000	miles	48	5	90	
Interstate access points	miles	18	2	60	
Four-lane highway	miles	11	1	34	
Military base	miles	37	4	84	
Stockyard	miles	14	2	40	
Grain elevator	miles	10	1	25	
Cotton gin	miles	7	1	25	
Park	miles	27	7	70	
National forest	miles	34	1	94	
Campground	miles	42	2	99	
Navigable river	miles	14	1	56	
Rail loading point	miles	13	1	33	
Population density (people/sq. mi.)		104	28.1	232.3	

[1]For all 76 tracts.
[2]For tracts possessing this characteristic.

provements, 18 percent had both farm and residential improvements.

The seller negotiated 80 percent and financed 16 percent of the transactions. Cash sales accounted for 25 percent of the exchanges, with buyers financing 75 percent of the purchases. Local banks financed 41 percent of the tracts which were financed. The average interest rate for a land loan was 7.88 percent. All or part of the mineral rights were reserved for 43 percent of the tracts. For these transactions, sellers retained either 50 or 100 percent of the rights, with an average of 94 percent.

TABLE 2. SALE CHARACTERISTICS OF RURAL LAND TRANSFERS IN THE LIMESTONE REGION OF ALABAMA, 1977

Sale characteristics	Unit	Average[1]	Low	High	Average[2]
Real estate market value per acre	dollars	1,077	115	5,667	
Total improvements per acre	dollars	365	0	5,667	
Residential	dollars	334	0	5,667	391
Farm	dollars	31	0	447	110
Down payment	dollars	16,076	0	159,000	
Transaction negotiated with owner	percent	80			
Cash sale	percent	25			
Financed	percent	75			
Local bank	percent	41			
Owner	percent	16			
Federal Land Bank	percent	9			
Credit union	percent	4			
Farmers Home Administration	percent	1			
Veterans Administration	percent	4			
Interest rate	percent	5	0	10	7.88
Mineral rights reserved	percent	43	0	100	94

[1]For all 76 tracts.
[2]For tracts possessing this characteristic.

Individuals purchased 90 percent of the parcels, with corporations and partnerships purchasing 6 and 4 percent, respectively, table 3. Twenty-four percent of the buyers derived some income from farming. Buyer age averaged 42 years. The average level of educational attainment of buyers was 13 years. Family annual income averaged $25,900.

Twenty-two percent of the buyers planned to live on the property. Average distance between purchased property and buyers' residence was 30 miles (only 10 miles when absentee owners were excluded). Almost 50 percent of the transactions were for property adjacent to previous holdings. Previous holdings of the buyers averaged 317 acres, with a range from none to 10,000 acres. Purchasing land for farming or home and farming accounted for 47 percent of the transactions. Speculation and development were reasons for 28 percent of the transactions, while recreation and residences accounted for 2 and 19 percent, respectively.

Sixty-seven percent of the parcels of rural property were sold by individual landowners, while 3 percent were sold by corporations and 9 percent by partnerships. As an average, individual sellers were 50 years old, had attained 13 years of education, and had family annual income of $22,300. Over 50

TABLE 3. CHARACTERISTICS OF BUYERS INVOLVED IN RURAL LAND TRANSFERS IN THE LIMESTONE REGION OF ALABAMA, 1977

Buyer characteristics	Unit	Average	Low	High
Corporation	percent	6		
Partnership	percent	4		
Individuals	percent	90		
Age	years	42	22	67
Education	years	13	6	20
Family annual income	dollars	25,900		
Reason for purchase				
Home	percent	19		
Farming	percent	23		
Home and farming	percent	24		
Recreation	percent	2		
Speculation	percent	21		
Development	percent	7		
Tax shelter	percent	4		
Distance residence from property	miles	30	0	1,000
Previous holdings	acres	317	0	10,000
Plans to live on property	percent	22		
Percent having farm income	percent	24		
Owned adjacent property	percent	46		

percent of the sellers sold their property for income, 14 percent sold because of age, 7 percent sold to divide the property among heirs, 14 percent sold because the distance from their residence was too great to effectively manage the property, and 13 percent for reasons not given. The sellers had owned the parcels an average of 10 years. However, 16 percent of the

TABLE 4. CHARACTERISTICS OF SELLERS INVOLVED IN RURAL LAND TRANSFERS IN THE LIMESTONE REGION OF ALABAMA, 1977

Seller characteristics	Unit	Average	Low	High
Corporations	percent	3		
Partnerships	percent	9		
Estates	percent	21		
Individuals	percent	67		
Age	years	50	27	89
Education	years	13	5	20
Family annual income	dollars	22,300		
Reason for selling				
Income	percent	52		
Age	percent	14		
Divide between heirs	percent	7		
Distance	percent	14		
Other	percent	13		
Years seller owned property	years	10	0.2	52
1 or less	percent	16		
3 or less	percent	41		
5 or less	percent	54		
10 or less	percent	66		

tracts were held 1 year or less, 41 percent were held for 3 years or less, and 54 percent were held for 5 years or less. Well over half (66 percent) of the tracts sold had been owned 10 years or less.

Rural Real Estate Value Model

The real estate value model was specified as follows:

$$V = a + b_1L_1 + b_2L_2 + b_3L^2{}_2 + b_4L_3 + b_5L^2{}_3 + b_6L_4 + b_7L_5 + b_8L_6 + b_9L_7 + b_{10}L_8 + b_{11}P_1 + b_{12}P_2 + b_{13}P_3 + b_{14}P_4 + b_{15}P_5 + b_{16}P_6 + b_{17}P_7 + b_{18}S_1 + b_{19}S_2 + b_{20}S_3 + b_{21}S_4 + b_{22}S_5 + b_{23}S_6 + b_{24}T_1 + b_{25}T_2 + U_1$$

where:

V = dollar value of rural land in terms of the real estate value per acre (including dwelling and other buildings), which was calculated as the quotient of total sale price divided by the size of the property in acres.

Location variables were:

L_1 = population density (persons per square mile) of the county district in which a parcel of property was located
L_2 = distance (miles) property was from a city of greater than 5,000 population
L_3 = distance (miles) property was from a city of greater than 25,000 population by road
L_4 = distance (miles) property was from a campground by road
L_5 = distance (miles) property was from a grain elevator by road
L_6 = distance (miles) property was from a cotton gin by road
L_7 = distance (miles) property was from a railroad loading point by road
L_8 = distance (miles) property was from the buyer's residence by road

Physical characteristics of a parcel of property were:

P_1 = value (dollars) of total farm improvements per acre[1]
P_2 = value (dollars) of total residential improvements per acre[1]
P_3 = percent of the property which was open; i.e., cropland and pastureland
P_4 = 1 if a pond, all weather stream, or river frontage was present on the property and = 0 otherwise
P_5 = 1 if the property had paved road frontage and = 0 otherwise
P_6 = 1 if the property had a community water line available and = 0 otherwise
P_7 = the number of farms in the county

[1]Based on the valuation of the buyer and seller at the time of sale.

Sales characteristics were:

S_1 = size of the property in acres
S_2 = 1 if the property was purchased for farming and = 0 otherwise
S_3 = 1 if the buyer negotiated the price with the owner and = 0 otherwise
S_4 = 1 if the buyer financed the purchase and = 0 otherwise
S_5 = 1 if the buyer lives or plans to live on the property and = 0 otherwise
S_6 = years owner has held the property

Type of ownership variables were:

T_1 = 1 if the buyer was a partnership or corporation and = 0 otherwise
T_2 = 1 if the seller was an estate and = 0 otherwise

There are numerous variables which affect the market value of farm real estate. Many of these were included and discussed in the theoretical model. The variables included in the statistical model measure the influence of factors expected to significantly affect rural real estate value. Some variables were excluded because of insufficient data and the high degree of correlation between various factors in the model.

Eighty-nine percent of the variation in rural land value was explained using the factors specified in the statistical model, table 5. Five of the variables accounted for 84 percent of the variance: location relative to cities having more than 25,000 population, value of residential improvements, paved road frontage, community water line on property, and size of tract.

Location relative to cities of greater than 25,000 population significantly influenced rural land value. As distance from cities of this size increased, value per acre decreased at a decreasing rate; that is, the relationship between value and distance to cities with over 25,000 population was curvilinear, figure 2. With other factors held constant, parcels of property within 6 miles of cities having 25,000 or more population commanded prices in the $1,500 to $2,000 range. Value was fairly stable for property 25-30 miles from such cities, selling for approximately $800 per acre. Beyond this distance predictions were not relevant because the relationship was outside the range of the data. The mean distance to the tract from cities of 25,000 or more population was 20 miles.

Three physical characteristics were significant: total value of residential improvements, paved road frontage, and presence of a community water line. Value of rural land

TABLE 5. ESTIMATES OF STRUCTURAL COEFFICIENTS FOR FACTORS AFFECTING THE RURAL REAL ESTATE VALUE PER ACRE IN THE LIMESTONE REGION OF ALABAMA, 1977

Factor	Coefficient	Standard error
	Dollars	*Dollars*
Intercept	1,463.48***	458.20
Location		
Population density of county district (L_1)	−0.69	1.32
Distance to a city of greater than 5,000 (L_2)	−3.48	44.87
Distance squared to a city of greater than 5,000 (L^2_2)	0.29	2.43
Distance to a city of greater than 25,000 (L_3)	−79.65***	30.23
Distance squared to a city of greater than 25,000 (L^2_3)	1.39***	0.63
Distance of parcel from a campground (L_4)	2.68	3.71
Distance of parcel from a grain elevator (L_5)	−5.60	12.84
Distance of parcel from a cotton gin (L_6)	−15.78	14.00
Distance of parcel from a railroad loading point (L_7)	13.07	10.75
Distance from buyer's residence (L_8)	0.42	0.48
Physical characteristics		
Total value of farm improvement per acre (P_1)	0.14	0.74
Total value of residential improvement per acre (P_2)	0.80***	0.07
Percent openland (P_3)	264.18	164.69
Presence of water on property (P_4)	−71.47	126.89
Presence of paved road frontage (P_5)	268.54*	140.15
Presence of community water line (P_6)	247.31*	128.69
Number of farms in the county (P_7)	−0.11	0.21
Sale characteristics		
Size of tract in acres (S_1)	−2.51*	1.39
Purchase for farming (S_2)	−59.40	150.96
Type of sale (S_3)	46.25	147.11
Buyer financed property (S_4)	32.51	155.00
Buyer planned to live on property (S_5)	182.46	122.19
How long seller owned property (S_6)	−4.44	5.33
Type of owner		
Business buyer (T_1)	26.34	186.88
Estate seller (T_2)	−126.45	154.41
Coefficient of determination (R^2)	0.89	
Standard error of estimate	402.64	

*Significant at .10 level.
**Significant at .05 level.
***Significant at .01 level.

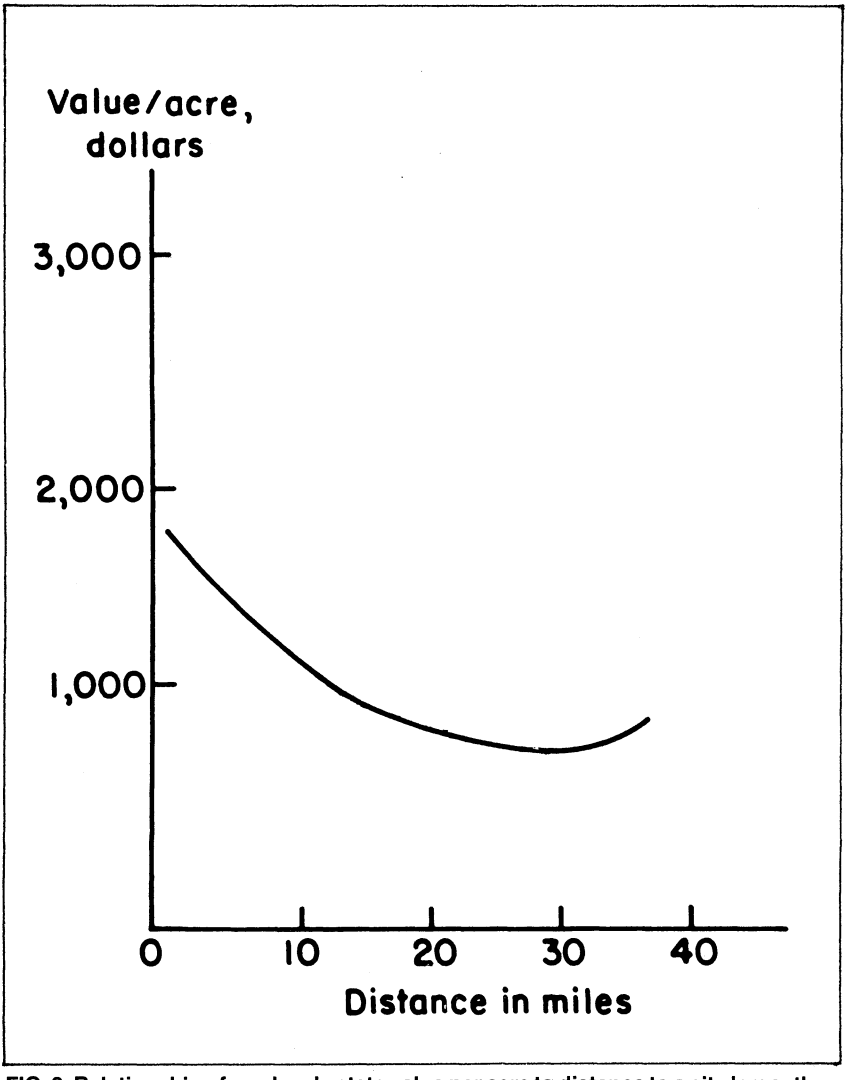

FIG. 2. Relationship of rural real estate value per acre to distance to a city larger than 25,000 population, with other factors entered at the mean.

increased by $0.80 per acre for each additional $1 of residential improvements per acre.[2] Presence of paved road frontage on a tract of property had a positive impact on rural land value, relative to gravel or no road frontage, adding $269

[2]A separate model was estimated aggregating improvement values, farm plus residential improvements. The estimated coefficient of 0.79 was significant.

per acre. Presence of a community water line added $247 per acre to value.

Tract size was the only sale characteristic to have a significant negative impact on value. For each additional acre in a tract of land, value decreased $2.51 with other factors held constant.

Utilization of the Model

Interest in the rural land market has heightened in recent years due to high rates of appreciation in land values. Buyers and sellers of rural property and others interested in the rural land market desire information about factors contributing to differences in land values and also estimates of value. The model developed in the previous section can be used to develop such data.

To illustrate use of the model, consider the following hypothetical example tract of land located in the Limestone Soil Region using the specified model to predict value per acre. Assume the example parcel has the characteristics shown in table 6. Given this information and the estimated coefficients of the specified model, rural real estate value per acre for the example property can be predicted as follows:

$$\begin{aligned}\text{Value per acre} = {} & 1463.48 - .69\,(150) - 3.48\,(10) + .29\,(10)^2 - 79.65\,(20) + \\ & 1.39\,(20)^2 + 2.68\,(10) - 5.60\,(20) - 15.78\,(10) + 13.07\,(11) \\ & + .42\,(1) + .14\,(150) + .80\,(400) + 264.18\,(.50) - 71.47\,(1) + \\ & 268.54\,(1) + 247.31\,(0) - .11\,(900) - 2.51\,(50) - 59.40\,(1) + \\ & 46.25\,(1) + 32.51\,(1) + 182.46\,(1) - 4.44\,(13) + 26.34\,(0) - \\ & 126.45\,(0) = \$808.13.\end{aligned}$$

Thus, the predicted value for this particular tract is $808 per acre or $40,400 total.

Several considerations are inherent in the effective use of this model. First, the model has relevance only in the sample area from which the data were collected. It should not be used for property outside the Limestone Soil Region as indicated in figure 1. Also, estimated values depend on the time when the original data were collected. Structurally, model coefficients should be valid for several years, especially if the local economy changes little. Thus, estimates should be updated periodically to reflect appreciation of value. USDA estimates of changes in farmland values or personal estimate can be used to accomplish this. For example, data for the estimated model were collected in the first 6 months of 1977. Assuming that

land values have increased by 8 percent since then, the current estimate of value would be $873 per acre ($808.13 x 1.08).

This method does not exclude or substitute for use of the traditional approaches to value—income capitalization approach, market comparison approach, or replacement cost ap-

TABLE 6. CHARACTERISTICS OF AN EXAMPLE PARCEL OF PROPERTY LOCATED IN THE LIMESTONE SOIL REGION OF ALABAMA TO BE USED IN ILLUSTRATING THE MODEL

Factor	Units	Quantity
Location		
Population density of county district (L_1)	persons/sq. mile	150
Distance to a city of greater than 5,000 (L_2)	miles	10
Distance to a city of greater than 25,000 (L_3)	miles	20
Distance of parcel from a campground (L_4)	miles	10
Distance of parcel from a grain elevator (L_5)	miles	20
Distance of parcel from a cotton gin (L_6)	miles	10
Distance of parcel from a railroad loading point (L_7)	miles	11
Distance from buyer's residence (L_8)	miles	1
Physical characteristics		
Total value of farm improvement per acre (P_1)	dollars/acre	150
Total value of residential improvement per acre (P_2)	dollars/acre	400
Percent openland (P_3)	percent	50
Presence of water on property (P_4)—yes	1 or 0	1
Presence of paved road frontage (P_5)—yes	1 or 0	1
Presence of community water line (P_6)—no	1 or 0	0
Farms in the county (P_7)	number	900
Sale characteristics		
Size of tract in acres (S_1)	acres	50
Purchase for farming (S_2)—yes	1 or 0	1
Type of sale (S_3)—owner	1 or 0	1
Buyer financed property (S_4)—yes	1 or 0	1
Buyer planned to live on property (S_5)—yes	1 or 0	1
How long seller owned property (S_6)	years	13
Type of owner		
Business buyer (T_1)—no	1 or 0	0
Estate seller (T_2)—no	1 or 0	0

proach. It is a supplement to these methods which is fairly simple to use and provides a reflection of forces operating in the market.

SUMMARY AND CONCLUSION

The primary objective of this study was to isolate and analyze the influence of various physical and economic factors affecting the value of rural property in the Limestone Soil Region of Alabama. Since the supply of land is relatively fixed in the short run, demand factors were expected to be the main determinants of the value of rural real estate. A random sample of the bona fide land sales which had taken place between January 1977 and June 1977 was made. Seventy-six transactions were selected for analysis. Interviews, tax office records, and deed books were sources of study data pertaining to these rural real estate transactions. Characteristics of the tracts transferred and personal characteristics of the buyer and seller were summarized. The average price of rural real estate in the region was $1,077 per acre while the average value of bare land was $712.

Multiple regression analysis was used to isolate factors which had a significant impact on rural real estate value. A model was specified with value per acre as the dependent variable and physical, location, sales, and type of ownership characteristics as the independent variables. This model explained 89 percent of the variation in rural land value.

Five factors were identified as significant contributors to variation in land value: location relative to cities having more than 25,000 population, the value of residential improvements, presence of paved road frontage, presence of a community water line, and size of the tract.

A curvilinear relationship existed between value and distance to cities of 25,000 or more population. As distance to cities of this size increased, value increased at a decreasing rate. Near these cities value was $1,500 to $2,000 per acre, while value was approximately $800 per acre 25 to 35 miles away.

Real estate value increased by $0.80 per acre for each additional $1 of residential improvements per acre. However, farm improvements did not significantly influence value. Presence of paved road frontage, relative to gravel road frontage or no road frontage, added $269 per acre to value with other factors

held constant. Also, value per acre increased by $247 when a community water line was present, other things being equal. Value per acre decreased $2.51 for each additional acre in the tract.

From the results of this study, it was concluded that the rural land market in the Limestone Soil Region of Alabama in 1977 was primarily agricultural but had several strong influences from the non-agricultural sector. Forty-seven percent of the parcels were bought for farming and/or home and farming. In contrast, 55 percent of the sellers had originally bought for farming reasons. Home and speculation comprised 18 and 21 percent of the transactions, respectively.

There was a rapid turnover of property in this region of Alabama. Sixty-six percent of the tracts sold were owned by the seller for 10 years or less, while 54 percent were sold after the owner held the parcels 5 years or less. Forty-one percent of the sellers held the property for 3 years or less and 16 percent for 1 year or less.

Average size of a tract was 56 acres. Only 16 percent of the sampled parcels were equal to or greater than 100 acres, while 59 percent were less than 50 acres.

The majority of land transactions were negotiated between an individual buyer and individual seller. Sellers were 8 years older than buyers on the average. Eighty percent of the buyers owned land prior to the analyzed transaction, indicating that buyers were adding to existing holdings. Almost 50 percent of the transactions were for property adjacent to existing holdings, indicating that farm or land expansion was a primary motive for purchasing the additional property. Since rural property is generally sold infrequently, buyers were taking advantage of the opportunity to purchase adjacent property. Competitiveness of the market was evident from the fact that no single buyer was involved in a large number of transactions.

Sixty-six percent of the transactions were for property with paved road frontage, and 88 percent of the tracts had some type of road frontage. Presence of paved road frontage and a community water line resulted in an increase in value per acre of $269 and $247, respectively, which tends to indicate the importance of non-agricultural or development potential of rural land in this area.

The Limestone Soil Region of Alabama tended to have smaller size tracts with higher value per acre relative to the Black Belt and Wiregrass regions *(7,8)*. The influence of non-agricultural factors seemed to be more important in affecting the rural land market and value in the Limestone Soil Region.

The non-farming sectors will become increasingly important to the rural land market in the Limestone Soil Region, especially if land value trends continue upward as they have in the past. High land prices coupled with low farm returns could force important changes in land use patterns in the area. Already, it is questionable whether typical farm incomes can justify the land prices observed in the region. Without fairly rapid rates of appreciation in farmland values, it is doubtful whether farmers could purchase and hold such property. Indications are that rural land will tend to shift to higher value uses, especially when tract sizes are small. Farmers' ability to remain in business will greatly affect this situation.

SELECTED REFERENCES

(1) Alabama Crop and Livestock Reporting Service. 1978. Alabama Agricultural Statistics. Montgomery, Ala.

(2) Anonymous. 1978. Farm Facts and Fancies. The Furrow. April 1978.

(3) Barlowe, Raleigh. 1972. Land Resources Economics. Prentice Hall, Inc., Englewood Cliffs, N. J.

(4) Hajek, B. F., F. L. Gilbert, and C. A. Steers. 1975. Soil Associations of Alabama. Auburn Univ. (Ala.) Agr. Exp. Sta. Agronomy and Soils Dept. Ser. No. 24.

(5) Laird, David T. 1978. Variations in Rural Land Values in the Limestone Soil Region of Alabama. Unpublished M.S. Thesis, Auburn Univ.

(6) Lanham, Ben T., Jr., J. H. Yeager, and Ben F. Alvord. 1953. Alabama Agriculture, Its Characteristics and Farming Areas. Auburn Univ. (Ala.) Agr. Exp. Sta. Bull. 283.

(7) Nelson, W. E. and J. L. Adrian. 1976. Variations in Rural Land Values in the Black Belt Region of Alabama. Auburn Univ. (Ala.) Agr. Exp. Sta. Bull. 483.

(8) Spurlock, S. R. and J. L. Adrian. 1978. Variations in Rural Land Values in the Wiregrass Region of Alabama. Auburn Univ. (Ala.) Agr. Exp. Sta. Bull. 504.

(9) U.S. Department of Commerce. 1977. Statistical Abstract of the United States. Washington, D.C.

(10) Walker, Larry A. and John F. Jones. Farm Real Estate Market Developments. USDA, ESCS, NEAD., Washington, D.C.

Alabama's Agricultural Experiment Station System
AUBURN UNIVERSITY

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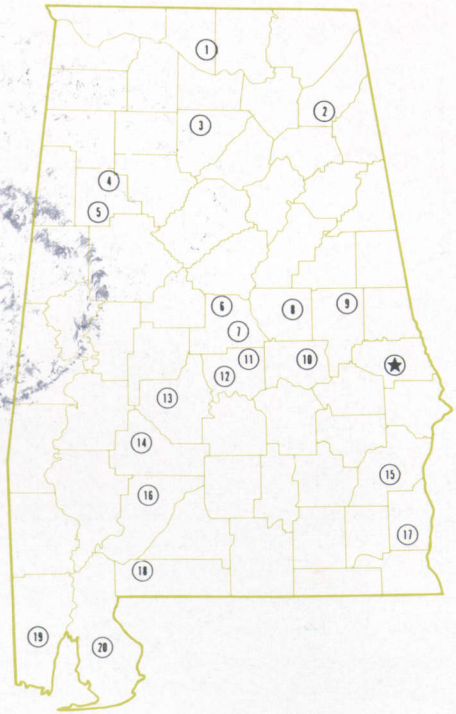

Research Unit Identification

★ Main Agricultural Experiment Station, Auburn.

1. Tennessee Valley Substation, Belle Mina.
2. Sand Mountain Substation, Crossville.
3. North Alabama Horticulture Substation, Cullman.
4. Upper Coastal Plain Substation, Winfield.
5. Forestry Unit, Fayette County.
6. Thorsby Foundation Seed Stocks Farm, Thorsby.
7. Chilton Area Horticulture Substation, Clanton.
8. Forestry Unit, Coosa County.
9. Piedmont Substation, Camp Hill.
10. Plant Breeding Unit, Tallassee.
11. Forestry Unit, Autauga County.
12. Prattville Experiment Field, Prattville.
13. Black Belt Substation, Marion Junction.
14. Lower Coastal Plain Substation, Camden.
15. Forestry Unit, Barbour County.
16. Monroeville Experiment Field, Monroeville.
17. Wiregrass Substation, Headland.
18. Brewton Experiment Field, Brewton.
19. Ornamental Horticulture Field Station, Spring Hill.
20. Gulf Coast Substation, Fairhope.