FOREWORD

Agricultural Lands: A Southern Perspective, by Dr. Merle C. Prunty, is a reprint of a base paper by the same name that was presented to four Agricultural Lands Study workshops in the South. The workshops were conducted by the Southern Rural Development Center in cooperation with the land-grant institutions of the South. The Southern region workshops were a part of 17 being sponsored nationwide by the federal interagency National Agricultural Lands Study.

Workshops were conducted in Memphis, Tennessee; Irving, Texas; Burlington, North Carolina; and Tallahassee, Florida during November and December of 1979. The purpose of the workshops was to assess the feeling and opinions of the publics being affected by the transfer of agricultural lands.

Agricultural Lands: A Southern Perspective provides insight into the land base for agriculture in the South and gives possible reasons for its loss. It provides an overview to the critical situation.

The typescript for this manuscript was prepared by Dawn Tolbert, Dr. Prunty’s personal secretary. Dr. Prunty is Alumni Foundation Professor of Geography at the University of Georgia, Athens, Georgia.

This paper will be included in the National Agricultural Lands Study final report to the President in January, 1981.

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February, 1980
Agricultural Lands Study Workshops

AGRICULTURAL LANDS: A SOUTHERN PERSPECTIVE

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One of the difficulties we face in this Seminar is the great diversity of landforms, soils, and agricultural activities that occur across the South. Generalizations about the South as a whole are, therefore, dangerous. We are not discussing a region anywhere near as homogeneous as the Middle West with its endless miles of flat to undulating plains filled with a succession of corn-hog-soybean-small grain farm operations.

Of all the natural features of the South, the only one that is reasonably close to uniform from central Texas to Virginia is climate, but even the climate isn't truly uniform. There is a lot of difference, for example, in the 180-190 day growing season of central Kentucky and the 300-plus day growing season of the lower Gulf Coast. And while everyone knows that annual precipitation averages about 45 to 50 inches across the region, with no distinct dry season such as California has, the Louisiana-Texas Gulf Coast and the southern Appalachians get much more rain than the rest of the region. Our monthly precipitation averages mask a critical fact for all agriculture in the South, and that is the great variability, hence the unreliability, of rainfall during the growing season in most parts of the region. I estimate that three years out of five one or more large subregions of the South experience some significant crop damage from short-term summer droughts that monthly rainfall averages don't record. Of course that is the principal reason for the region-wide interest in supplemental irrigation during recent years. Heavy autumnal rains from hurricanes along the Gulf and South Atlantic coasts add still another dimension of climatic variability.
If our most nearly uniform environmental element, that of climate, contains variations of the sorts I've just mentioned, then what of the differences in landforms, soils and natural vegetation?

The differences are enormous. There is only one alluvial Mississippi valley with its tremendously productive soils, distinctive bottomland hardwood forest complex, and huge farms. The southern high plain in west Texas, the Llano Estacado, is a vast flat short-grass upland plain dotted with small sinks, or depressions, has no permanent streams across it, supports relatively deep and permeable soils, and has something more than 40,000 irrigation wells dotted across it. No other southern area approximates the Llanos. Florida's Central Highland Ridge, with its deep sandy soils on a rolling terrain covered with citrus groves, is unique in the South. The same thing can be said about the Piedmont of Georgia, the Carolinas, and Virginia. There is no other southern subregion quite like the Piedmont.

The foregoing examples are enough to underscore the point. Generalizations about the land base for agriculture in the South are dangerous, if not unacceptable. The South is not "a region" in terms of its natural and environmental attributes; instead, it is a collection of areas each of which is distinctive. When the South is identified as a region it must be done on the basis of its cultural traits and its common economic and cultural history, and not on the basis of its natural environments because of the diversity involved. There are a number of widely available sources that delineate the characteristics of the South's natural subregions in detail; other than referring occasionally to key traits of some subregions in connection with pressures on our agricultural lands, I do not intend to repeat all this available information. I have provided references to these sources for those who wish or need to consult them. (1)
TABLE I

LAND IN FARMS AND AVERAGE FARM SIZE IN THE SOUTH, 1949 AND 1974

<table>
<thead>
<tr>
<th>State</th>
<th>Land in Farms (1,000 acres)</th>
<th>Percentage of Decline</th>
<th>Average Acreage Per Farm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1949</td>
<td>1974</td>
<td></td>
</tr>
<tr>
<td>Virginia</td>
<td>15,572</td>
<td>9,678</td>
<td>38</td>
</tr>
<tr>
<td>North Carolina</td>
<td>19,318</td>
<td>11,244</td>
<td>42</td>
</tr>
<tr>
<td>South Carolina</td>
<td>11,879</td>
<td>6,177</td>
<td>49</td>
</tr>
<tr>
<td>Georgia</td>
<td>25,751</td>
<td>13,878</td>
<td>46</td>
</tr>
<tr>
<td>Florida</td>
<td>16,528</td>
<td>13,199</td>
<td>20</td>
</tr>
<tr>
<td>Kentucky</td>
<td>19,442</td>
<td>14,432</td>
<td>26</td>
</tr>
<tr>
<td>Tennessee</td>
<td>18,534</td>
<td>13,103</td>
<td>31</td>
</tr>
<tr>
<td>Alabama</td>
<td>20,889</td>
<td>11,853</td>
<td>45</td>
</tr>
<tr>
<td>Mississippi</td>
<td>20,711</td>
<td>14,300</td>
<td>31</td>
</tr>
<tr>
<td>Arkansas</td>
<td>18,871</td>
<td>14,642</td>
<td>24</td>
</tr>
<tr>
<td>Louisiana</td>
<td>11,202</td>
<td>9,133</td>
<td>18</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>36,007</td>
<td>33,083</td>
<td>8</td>
</tr>
<tr>
<td>Texas</td>
<td>145,389</td>
<td>134,185</td>
<td>8</td>
</tr>
</tbody>
</table>

TOTALS 380,093 298,907

Regional Percentage Decline: 21.4

Regional Decline Per Year, Average: 3,247,440 ac.

Sources: U. S. Censuses of Agriculture, 1950 and 1975
The general problem which confronts us is indicated by Table I. In the years since World War II there has been a general decline across the South in the amounts of farmland. The two western most states have experienced the smallest declines and, as of 1975, Texas and Oklahoma contain a little more than half the farmland in the southern region. The South Atlantic states plus Alabama have experienced the largest proportionate losses. For the region as a whole, a bit more than 3,000,000 acres have disappeared each of the last 25 years, on the average. The table cannot show it, but declines have been less severe since 1970 than they were in the 1950s and '60s.

The decline in overall farmland acreage has been accompanied by Census reports of major increases in average size of farm. However, the Census is quite misleading in this respect. Beginning in 1880, after sharecropping had become widespread in the South, the Census reported each sharecropper unit on a plantation or other large farm as a separate farm. The result was a mammoth increase in number of farms reported in 1880 versus 1870, and thereafter. Sharecropping has virtually disappeared in the South since World War II, and as former share-tenant units have been coalesced into the landholdings of which they always were parts, the number of farms enumerated by the Census has dropped accordingly. The result is that the Census now reports far fewer but much larger farms in the South than formerly. In addition, there has been a considerable increase in acreage owned per farm through purchases by those who have chosen to remain in farming during a period of population outmigration from our rural areas. Finally, the actual size-of-unit farmed is considerably larger than the Census figures on average farm size indicate. Multiple-unit farmers are widespread -- in fact, they may be the backbone of
American agriculture today. A multiple-unit farmer may own all the tracts he farms, he may own none of them and rent them all, or he may own one or two and rent the rest. But he is farming two, five, or a dozen noncontiguous tracts that may be scattered over a radius of a dozen miles or more. (2) There is no way to break the sizes of multiple units out of the Census reports; however, it is generally agreed that their average size is considerably greater than the average size-of-farm figures shown on Table I.

Another side of the story of farmland decline is displayed by the map of cropland increase and decline (Figure I). Note that it displays only cropland, not land in farms, nor farmland used for pasturage, nor farmland in woodland. The only large areas which display increases in cropland are on the Gulf coastal plain and in Florida, and in the alluvial Mississippi Valley. The Florida and eastern Gulf Coast areas of increase had relatively small amounts of cropland in 1939, and still do. Because they have experienced moderate cropland increments to what was a small acreage in 1939, the percentage of increase which they display is considerable, even though their present cropland acreage isn't great. The alluvial Mississippi valley, on the other hand, has experienced large cropland increases both proportionally and in absolute amounts. There has been a great deal of land clearing and forest removal throughout the valley in the past 35 years -- more, apparently, than in all the rest of the South combined.

The map makes some essential points. All areas in white on the map have undergone cropland losses of more than 50 percent. Since the cropland inventory has grown in the alluvial valley sections of Arkansas, Louisiana and Mississippi, the farmland losses in the remaining portions of those states has been severe to give them the farmland declines we saw on the
Cropland Harvested 1974 as a Percentage of 1939


Figure I.
preceeding table. Areas that have gone heavily into permanent pastures or poultry production are displayed as cropland decline areas on this map. That does not mean, by itself, farmland loss proportionate to the cropland loss which the map displays. Nonetheless, the overall message from the map is alarming. It is one of broad decline, with only a few exceptions.

There are several causal forces that have been responsible for agricultural land declines in the South since World War II. I want to present these, as I see them, one at a time and then summarize by listing them at the close of this presentation.

First, the South has undergone a dramatic economic renaissance, a transformation, since the 1930s. People who write and talk of the rise of the Sunbelt are, for the most part, discussing this southern renaissance, for most of it has occurred in the South and not the Southwest. No other region of the nation has experienced anything close to the economic transformation that the South has experienced during the past 40 years. In my opinion this involves the most important economic and demographic developments in the nation during the 20th century, the intra- and extra-regional implications of which are beginning to be recognized only now. While urbanization is the most easily identifiable consequence, much more is involved.

Large-scale examination of many areas could attest to the changes since 1930, but I have selected just one. The economic hub of Morgan and Limestone counties, in northern Alabama's portion of the middle Tennessee River valley, is the growing city of Decatur. Founded in the 1830s, it was served by the first U.S. railroad built west of the Appalachians (in 1833), became one of the earliest rail centers in the South, and it always has had the advantage of location on the Tennessee River waterway. In recent years
it also has become the focus of several major highways and currently is
experiencing the trauma associated with completion of Interstate 65 on its
eastern margin. In the 1930s Decatur was a county seat market service town
of about 12,000. By 1950 it had grown to some 20,000, and today it contains
about 45,000. It has tripled its population and about quadrupled its urbanized
area in 35 years. In the late 1940s its industrial inventory included a
couple of textile mills, a fertilizer plant, a small boat works, a woods
products plant, a flour mill, and a grist mill that produced corn meal and
grits. Today the Decatur waterfront is lined for miles with major industrial
plants, including mammoth installations by 3M, Monsanto, and Amoco; a large
fabricator of steel barges; several huge grain elevators and livestock feed
mills; a giant cement plant; and a major producer of seamless steel,
aluminum, and copper tubing. There are more plants, but this listing is
sufficient to make the point. Most of these plants have been constructed
on what was prime agricultural land 25 years ago. Decatur has been trans-
formed from a predominantly farm market service town to a burgeoning little
industrial center. The same transformation has occurred in hundreds of
towns, large and small, everywhere from Virginia to Texas. Urban growth,
expansion, or "urban sprawl" -- take your pick of terms -- has consumed a
lot of one-time agricultural land since World War II. This condition is
obvious when one takes a look at any metropolitan area -- Richmond or Dallas
or Memphis, or any others -- and the ability of the farm operator to retain
his land near the urban fringes of any metropolitan center today is marginal.

Decatur, Alabama, is not a metropolitan area. A point often overlooked
is the growth and sprawl of the smaller towns across the South. The region
contains about 2,270 towns with populations between 1,000 and 50,000 and
2,123 of these (all but about 150) gained substantially in population and built-up area between 1940 and 1970. (3) So it is not merely metropolitan growth but expansion of the built-up areas of virtually all urban places that has consumed agricultural lands adjacent to southern towns in recent decades. (4) I don't mean to imply that the agricultural sector of Decatur's economy has been knocked out by urban sprawl. While it has burst into bloom in an industrial sense, agriculture in Decatur's trade territory has undergone the same fantastic mechanical and technologic revolution that all southern agriculture has since World War II and today produces more than four times the product value that it did in 1940 with one-fifth as many people employed.

Urban expansion at the expense of agricultural land is not confined to any one natural or physical sub-region of the South; it has occurred in nearly all of them. Consider the case of the Radford-Blacksburg-Christianburg triangle, located in the Appalachian Ridge-and-Valley of southwestern Virginia. These three small towns are experiencing rapid population influxes and their built-up areas are sprawling in all directions at the expense of superior agricultural land. The inadequacy of rural zoning and planning to protect the farmland inventory is strikingly illustrated at Blacksburg by handsome silos that now are essentially surrounded by recent residential developments. We can see the same sprawl north, south and west of Houston, and nearly everywhere else across the region.

The causes of the urban expansions in the South are three-fold. The first is the dramatic industrial upsurge in most parts of the area since the 1930s. Agriculture was displaced by industry as the primary source of employment during the early 1950s. The industrial upsurge came at about the
same time that mechanization of agriculture hit the South and the attractive wages offered by industry pulled many workers off of farms into factories. Indeed, it is my considered opinion that, until the mid-1960s, the "pull" on farm population exerted by factory and city employment was a considerably greater force than was the "push" exerted by mechanization on the farms, and I am on record to that effect. (5) During the '40s, '50s and early '60s, most farm operators had no choice; they had to mechanize to stay in business as erstwhile rural workers left the countryside.

The results of all this can be summarized in a few words. In the 1930s the South's population was 70 percent rural; today it is about 70 percent urban. Approximately 25 of the remaining 30 percent are rural non-farmers who are urban-oriented for both employment and services. The residual five percent consists of the families of farm operators but nearly half of these operators derive most of their income from non-farm employment. Thus of some 60-plus million people in 12 southern states today, something less than 1,400,000 derive their support primarily from farming. There are fewer farm residents in the South now than in the 12 North Central states, both in absolute numbers and in proportion of total population. The most rural, or agrarian, regions in the country now are the Middle West and the Great Plains, not the South. Today's South still is slightly less urban than the national average but the differential is diminishing rapidly and probably will have disappeared by 1985. This means that disappearance of agricultural lands along the fringes of towns and cities will continue for the foreseeable future, and probably at a greater rate than in the recent past because we appear to be using about 60 percent more land area today for each person that we add to an urban population than we used 30 years ago. (6)
Present trends suggest that the South will be slightly more urbanized than the nation as a whole by the end of the century. This gets us to the third cause of urban growth, which is population migration into the South.

Throughout this century until 1965, there was a consistent pattern of population out-migration from the South. But since the middle 1960s this historic trend has been reversed by a steady and growing in-migration. There are indications from the Census Bureau that the out-migration of blacks also has been reversed since 1970, again a reversal of a historic trend. Presently, net population inflow from the Northeast and Middle West appears to be about 2.5 times larger than outflow.\(^7\) The rate of population growth for the South since 1970 has been about 10.4 percent while in the Northeast and North Central states the growth rates have been about one and two percent respectively. The in-migration has been heavily oriented toward our urban areas, though not wholly so. It is partially related to industrial growth but it also signifies long-term expansion in the service industries and in the aggregate market attraction of the South to still more industry. Secondary portions of this in-migration involve people moving into resort and retirement communities and into second-home developments. Florida, the southern Blue Ridge, southern Cumberland Plateau, the Arkansas Ozarks, and nearly all of the Gulf and South Atlantic coastal zones have felt the impact of resort and retirement developments on what once were agricultural lands.

There is no end in sight to the growth of towns and metropolitan areas in the South. The forces behind the population growth are long-term ones. Therefore, the pressures on agricultural lands adjacent to urbanized areas will continue unless there is some intervening action in legislative form, or zoning, or similar. But as things are now, some astonishing metropolitan
growth can be expected. By the end of this century, we can expect the entire east coast of Florida from Jacksonville to Coral Gables to be one vast belt of metropolitan counties, and the same will be true of Florida's west coast from Naples to 50 miles north of St. Petersburg. Another major metropolitan area will stretch from New Orleans and Baton Rouge solidly across Mississippi to Mobile Bay and then eastward across the Florida panhandle as far as Fort Walton. Southwest Louisiana, the Texas coastal counties along the Sabine River, and Galveston and Houston will all have grown together into another megapolous. San Antonio and Austin will have grown to the point where they overlap as metro areas, and the Dallas-Fort Worth cluster will have expanded far enough north to encompass Denton. Memphis probably will double in area as it expands both east and west -- especially west on the Arkansas side of the Mississippi. On the Piedmont we can expect a solid belt of metropolitanized counties essentially from the Alabama line across Georgia northeastward through the South and North Carolina Piedmont into southern Virginia. Richmond will be the northern growth-pole of this metro belt, Atlanta the southwestern growth-pole, and North Carolina's "urban crescent" of cities that now stretches from Charlotte to Raleigh-Durham will have all grown together to form the middle of this vast metropolitanized area. This whole belt will consist of those counties athwart, and to either side of, the transportation "corridor" supplied by the main lines of the Southern and Seaboard railways plus Interstate 85. And don't forget those 2,100 small towns, most of which are outside of these emerging metropolitanized belts. They too will grow and expand areally. The rates of growth of non-metro towns and counties in the U.S. has been about a third greater than that of metropolitan areas during the 1970s.\(^{(8)}\)
To now I've been discussing the urban expansion phenomenon at regional scale. Let's shift, now, to the level of the community and its urban fringe, for that is where urbanizing forces gobble up agricultural land. The notion of the urban fringe as the zone around a town in which agricultural land and urban-suburban-industrial land uses are intermingled is widely accepted. But there is no workable definition of the urban fringe. We have to treat it as a variable from one community to another. There is broad agreement that the width of the urban fringe increases as the size of the town or city increases, but even that is a generality. In nearly any urban fringe there is some agricultural land that is next to the town proper and some suburban or residential land at the outer edges of the area. The actual urban influence extends well beyond any reasonable delimitation of the fringe, however, and is most noticeable in the effect that urban centers have on land values as much as one or two counties' width away from the city. (9)

The processes whereby agricultural lands are lost to urbanization can be illustrated by several examples. One process is to tax the farmland as though it were not farmland. Tax valuation of land on the basis of its "highest and best potential use" (also known as "best current market value"), instead of on the basis of "current land use," tends to drive farmland out of agricultural usage and into something else. My family presently is the victim of the "highest and best use" concept on one of our farms in Dyer County, northwestern Tennessee. The home farm forms the southeastern boundary of the little town of Newbern. Four years ago tax equalization, so-called, and re-evaluation under the "highest and best use" or "best current market value" concept, as ordained in Nashville, tripled the valuation and tax load on this property. It is tied up in a trust that cannot be dissolved during the life of my wife
or her sister; it has to be operated as a farm. Upon appeal, the assessors refused to recognize that under the terms of the trust this property could not be converted to the urban or residential land uses which were the basis for the new assessment. How something that cannot be sold can be said to have a market value escapes me! We are stuck. The added tax load has placed our beef cattle farm in a position which, at best, is marginal. I was last on this farm in August, 1979, and was dumbfounded to find four apartment houses under construction on a small farm across the road from us. That owner got the same valuation out of reassessment that we did, and now is following a logical line of economic thought to the effect that, if one is stuck with an urban tax rate, one might as well convert to urban land use. It isn't a large farm, but another piece of agricultural land is in the process of disappearing.

Five miles east of Newbern is the unincorporated village of Churchton, situated a quarter-mile from the junction of two blacktopped state roads. Under the highest and best use concept, the farms fronting on the junction got the same kind of re-evaluation treatment that our farm did. Some assessor decided that a junction out in the country could do better than serve as mere farmland. One owner sold off about 40 acres and in the past year it has been filled with new houses. What will happen to the tax loads of all agricultural lands within a mile or so of this junction when they are next reassessed is obvious. This "beyond the fringe" type of residential development can be seen all over the South today. It complements the rural residential strips along many highways, created by the sale of one-time agricultural land in 1, 2 or 5 acre tracts for residential purposes.
And then there is the land speculator or developer. He buys farmland at the outer edges of the urban fringe, waits for urban expansion, then sells for a considerable capital gain when the fringe encompasses his tract. Frequently he rents the farmland until he sells it, and he doesn't care if the renter puts it into row crops continuously because soil preservation means little to him. But also it is common to see such tracts standing idle -- frequently they grow up in bush and brush. Both speculators and developers much prefer flat, level land because building and development costs on such sites are lower than on rough terrain. The result is that the Class I and II agricultural lands are the most attractive. That land best for agriculture is the land most likely to be lost from the agricultural inventory near towns and cities.

The "factory in the country" is another phenomenon that consumes good agricultural land. Industries moving into the South have, again and again, opted for non-urban sites for construction of their plants. The Carolina Piedmont is loaded with such cases. They nearly always want vastly more land than their actual plant operation requires. They prefer sites on which construction costs will be minimal, which translates into level and relatively well-drained land, the superior farmland. The prices they are prepared to pay overwhelm the rural land owners; they cannot afford to turn them down. A case in point exists presently in my home town, Athens, Georgia. IBM is in the process of purchasing 900 acres eight miles west of the city adjacent to a four-lane section of U.S. 78. IBM publicly states that less than a fourth of this land area will ever be used for any purpose in connection with its manufactural and research processes. The land involved is mostly of good quality -- class II and III land under the SCS classification system -- and
it is principally farmland. An initial payroll for 5,000 people is projected. The business and political leaderships of the city and of the two counties involved are jumping up and down to do anything that IBM wants in order to install this plant. Not one word has appeared in print about the farmland losses that are involved and no one seems to be giving it a thought. This is not a unique case. IBM purchased a 700-acre site near Charlotte in 1970 and is installing a plant there that will use less than a fifth of the area they bought. At Boca Raton, Florida it has done the same thing on 550 acres of land and it did it again in Austin, Texas when it built a plant on a tract of about 1000 acres. I don't want to pick on IBM; in these cases they have done only what many firms have done. Those of you familiar with the Carolina Piedmont, the Houston area, or Orlando, Florida, or the tri-cities area of northeast Tennessee can cite case after case that parallels the present IBM situation in Athens.

Then there are the repeated instances in which livestock farmers close to cities have been forced to move or sell out as residential and suburban growth came close to or next to them. I call this the "zone-out" process. Suburbanites don't like the smell of animal manures, flies they attribute to animals, truck traffic to and from farms, and cows that moo in the night. The huge MacArthur Dairies on the northwest side of Miami found themselves in trouble with their new suburban neighbors before 1960 and decided to sell their lands and move. They relocated close to the northeast shore of Lake Okeechobee, far from the Florida east coast urban agglomeration. The lands they sold were wholly converted to urban uses by 1965. Only five miles south of Athens, Georgia, and one mile into Oconee County, is the farm of Phil Campbell, the former Undersecretary of Agriculture. This farm has been owned
by the Campbell family for more than 100 years. The Athens suburbs have
sprawled into Oconee County and several developers have successfully marketed
their residential properties within a mile of the Campbell farm. The Campbell
property is zoned for general agricultural usage with no restrictions. Two
years ago Phil Campbell and his son started into the development of a 1000 sow
confined hog farrowing and finishing operation. The buildings involved would
have been more than a mile from the nearest suburban residence, and lagoons
had been planned to handle all manures. There would have been some daily
inshipments of grain and outshipments of hogs. As soon as Campbell's
suburban neighbors heard of the project an almighty ruckus arose. The
matter went to the Oconee Zoning and Planning Commission immediately, with the
request that Campbell be rezoned so as to stop his hog operation. After some
weeks and several public hearings Campbell decided to fight no further; he
relocated the hog operation about 10 miles to the south on land adjacent to
absolutely nothing residential or suburban. In effect, Campbell was "zoned out".

The MacArthur Dairies and Phil Campbell cases bring to mind the little
"dairy cities" east of Los Angeles. Their origin goes back some 25 years to
a time when there were a number of 10 to 20-acre drylot dairy farms scattered
about in the San Fernando and nearby small valleys. Each had hundreds of cows
on its drylot surface, and feeds and grains were hauled in virtually daily
from the southern San Joaquin Valley. Tank trucks loaded with milk left for
the city once or twice a day from each farm. As the Los Angeles suburbs
sprawled into the valleys each dairy operator found himself surrounded by
suburbanites who objected to cows, manures, flies, and truck traffic. In due
course each suburban area was incorporated and in due course each came up with
zoning regulations that satisfied the suburbanites by zoning the drylot
dairies out of their communities. But the dairymen were ingenious. They got together and bought tracts farther to the east which they divided among themselves for their drylots, placed side-by-side except for the houses of their employees. They then incorporated their tracts as towns and then passed regulations that zoned out suburbanites and businesses and everything else except dairies and dairy employees.\(^{(10)}\) It seems there is still strength in numbers and joint action, and that the "zone out" process can be made to work both ways.

It is improper to convey the impression that formal urban absorption of farmland operates in the same manner in all states. In Georgia, for example, a city cannot annex adjacent territory without the consent of those being annexed by referendum. In Missouri a town can annex an adjacent area, if the town so decides, without the consent of those occupying the area involved. Each of you will know the situation in your own state. However, the urbanizing processes we have been discussing proceed, for the most part, beyond the formal limits of a city because the built-up area of most towns extends beyond the town boundary. Therefore the legal mode of annexation in the several states is of secondary importance.

Now -- these processes whereby agricultural land disappears into urban-suburban uses tend to happen most frequently in the urban fringe zone, please remember. Since the fringe extends beyond the formal city or town limits, the disappearances occur in what is, legally, the rural sector. Much of what I have recounted so far reflects the weakness of rural zoning regulations, and the weakness with which the regulations are applied, in the southern states. I view the lack of protection given farmland because of inadequate zoning as a major problem everywhere.
Interstates and other four-lane highways consume a lot of land -- something we all know, so I won't belabor the point. On the average, we pass through an acre of land for each 220 feet we roll down an interstate. Interchanges along interstates bother me, for nearly always some adjacent land has gone from agriculture to commercial uses. It also is bothersome to see about 100 acres of the Black Prairie near Dallas consumed by an interchange. Do the engineers have to be that flagrant in the use of land when they design these things? It seems that, when we build new highways or interstates, we never recoup the land along the old roadway that is being supplanted. The state or county retains the easement that it acquired for that old road and never do we take up the old road and revert the easements along it.

Tax laws of several sorts have been charged with causing disappearance of agricultural lands. Among these is the inheritance tax. Since the 1976 revision of the Federal inheritance tax I have looked for cases in which application of that tax actually caused farmland to disappear, but I have found none that were primarily chargeable to the tax. Both before and after 1976 there have been plenty of cases of farmland sold in order to meet the inheritance tax, but in those instances that I have "scouted" the land has passed to someone who continued to use it as farmland. The number of family-held farming corporations seems to be increasing even though the 1976 tax revision raised the minimum size of an estate subject to the inheritance tax by stages to roughly $250,000 by 1983. Those landowners with whom I have discussed all this clearly recognize that current escalation of land values coupled with inflation will place their properties in about the same position by 1982 or '83 -- in terms of relative values -- that they were in prior to passage of the 1976 tax act. Their response is to incorporate if they have
not already done so. In my opinion the move to incorporation of family-held farms, large or small, can add an element of stability and continuity to the farming scene which will tend to protect existing agricultural lands.

However, the "carryover basis rule" enacted in the Tax Reform Act of 1976 is a different and potentially dangerous matter. This rule does not affect inheritance taxes as such. It applies to income or capital gains tax due on any later sale of property, including timber harvested, by the heirs of an estate. The 1978 Revenue Act delayed the effective date of the "carryover basis rule" until January 1, 1980. Presently a strong effort is underway to repeal this rule, in the form of Senate Bill 112. Under existing law the tax basis on inherited property is its fair market value on the date of the deceased owner's death. If the heir sells immediately after inheriting the property there is no gain and therefore no tax. In contrast, the "carryover basis rule" sets the tax basis of the property at its cost to the decedent at the time the property was acquired, which may have been 10, 20, or 50 years before his death. Under this rule the heir who sells property will be taxed on the increase in value way back to the time when it was obtained by the decedent. This tax concept has been called a "capital gains tax at death" which has been deferred and imposed on the heirs of an estate. If not repealed, the "carryover basis rule" will -- ultimately but not immediately -- pose a threat to continuation of many farming and timber-growing enterprises not merely in the South but across the nation.* It also threatens many small businesses.

Excluding western Texas and Oklahoma, forests occupy more than 60 percent of the South, and roughly 75 percent of the forested acreage is privately owned. The total forested acreage in the South is between 200 and 208 million

*By an overwhelming vote, the Senate approved repeal of the "Carryover Basis" provision before recessing in December 1979 and, as of January 1, 1980, this repeal action was attached to the Windfall Profits tax bill (still pending) as an amendment.
acres (depending on whose estimates you wish to use). Production of woodstuffs is a slow-growth long-term business, heavily influenced by the nature of the capital gains tax. Therefore the repeal or reversal of the "carryover basis rule" is of substantial importance to practically all parts of the southern region. I am hoping for repeal, even though President Carter has threatened to veto a repeal action.

Taxation of forest lands presents some other current problems. Presently, if a landowner invests capital in reforestation -- say by mechanically replanting a tract after harvesting everything on it -- he cannot recover his reforestation costs until he begins to harvest from that tract which may be 25 or 40 years later, or even longer. He then can recover those costs before the capital gains tax is computed. If the owner takes the same money and puts it into any conservative investment today, such as Federal Savings and Loan deposit certificates, he can double his money in less than ten years (not allowing for income taxes). In other words, the returns from alternative investments reduce the amounts of forest land managed in an optimum manner because of this taxing pattern. An owner has another alternative, and that is to let natural reseeding restock the forest on his tract. He has no capital inputs to recover if he follows this route. If he goes this way the forest will be roughly 10 years longer getting to harvestable sizes, the quality of the forest will be lower and the gross yield also will be less per acre.

There is a bill in the U.S. Senate presently that could do much to rectify this condition. It is Bill #100, called the Reforestation Incentive Bill, and it has gotten through the Senate Finance Committee. This bill would allow private non-industrial forest-land owners a 10 percent tax credit the first year plus a 7-year amortization of capitalized reforestation costs, up to a
maximum of $10,000 annually. (It also contains provisions to promote the reseeding of publicly owned lands.) The average size of forested tracts held by private non-industrial owners is less than 70 acres, and about 145 million acres are held by this group of owners. Also, it is common knowledge that yields are lowest and forest management poorest -- or nearly absent -- on the tracts held by this group of owners. If the Reforestation Incentive Bill becomes law it can have a tremendous effect over the years in upgrading the quality and yields from roughly 70 percent of the South's forest lands. Higher yields from the forest lands are exceedingly important to the whole land use outlook for the South in the next two or three decades, a point I shall return to in a few moments.

At the state level, the manner in which ad valorem taxes are applied to forest land varies considerably. Two states -- Kentucky and Tennessee -- tax only the land and not timber as such. Three others -- Alabama, Florida, Louisiana -- employ a yield, or severance, tax at the time of harvest and thus postpone the tax until the forest is cut. Two states, Arkansas and Virginia, impose a yield, or severance, tax plus an annual tax to boot. All the other southern states use an annual tax on timber and land. It may be based on the "current use" concept or the "highest and best potential use" procedure, depending on which is in effect in the particular state. Missouri uses a "Bareland plus Yield" concept. Under this program the assessed value of the land is reduced to $1.00 per acre and a yield tax is assessed when the timber is harvested. An annual bareland tax plus a yield tax, when properly applied, can be about the most fair of all taxing systems applied to forest land. (11)

Currently, however, it is ad valorem taxation of rural property on the basis of the "highest and best use" or "best current market value" concept
that most upsets landowners in those states where it has been applied. You already have heard of a couple of examples from Tennessee. Georgia has it also. South Carolina is in the process of backing out of it and returning to "current use" as the valuation yardstick. Professional tax assessment firms customarily are employed to produce the new land valuations when the "highest and best use" concept is adopted. How a group of people with no prior knowledge of an area right down at the level of the individual landholdings can suddenly move into a county and then can exercise that pre-ordained knowledge necessary to determine precisely what is the best current market value of every single tract is beyond me. When coupled with urbanizing influences, I view the "highest and best use" property valuation concept as a major threat to the rural landscape. I'll be interested to hear how it is viewed by the participants in the seminar.

Some Federal programs have contributed to losses of agricultural lands. The best example probably is the Conservation Reserve Program, commonly called the Soil Bank. The program started in 1956 and ended in January of 1970. By 1960, some 4,829,000 acres of farmland were in the Soil Bank program in the eastern South, and western Texas and Oklahoma together came up with about another 4,000,000 acres in the Soil Bank. Some land went into the Soil Bank after 1960, so the foregoing figures are conservative. From central Texas eastward, the land that went into the Soil Bank went overwhelmingly into pine forest. Some areas of the South were much more heavily affected than others. The Blue Ridge and Appalachian Ridge-and-Valley areas were little affected, and the outer coastal plains of the South Atlantic and Gulf also were scarcely involved -- this because they already were heavily committed to forest land use. On the other hand, the Piedmont and Inner Coastal Plain of
the Carolinas and Georgia, southeastern Alabama, and north central Florida, went heavily into the Soil Bank -- in Georgia alone better than 1,000,000 acres were involved.

I have had no opportunity to check the western South, since the Soil Bank ended, to find out what has happened to that Soil Bank land since 1970. Since little of it in Texas and Oklahoma went into pine forest, I suspect that large acreages there have been reconverted to active farmland. But in the eastern South I am pretty sure of the story because my students and I have been checking it out. The eastern acreage placed under leguminous cover has mostly returned to production and appears to be related to the rapid expansion of soybean acreage in the Carolinas, Georgia and southeastern Alabama since 1970. But little of the pineland -- and that was the overwhelming majority of the Soil Bank acreage in the southeastern states -- has returned to productive farmland. We have interviewed hundreds of owners to determine their intentions regarding these pinelands in the future. Those that clearly intend to return these lands to farmland use within any reasonable time comprise a small minority. Many are no longer active farmers and are now employed in urban areas. Still others -- almost half of our sample -- believe another Federal subsidy program may come along that would include their one-time Soil Bank pineland, but say that if such a program does not appear they will begin to cash in on their pines in the next 5 to 10 years by harvesting for pulpwood.

The Piedmont and southeastern Coastal Plain have a history of gradual farmland decline that started prior to World War II. In general, the physically poorer land had gone out of cropland use before the Soil Bank was started, which means that Soil Bank pines went onto land that farmers had perceived for two or three decades as good enough to retain as cropland -- in short, their
better lands in many cases. (13) Thus, in a curious way a Federal program perceived by its designers as needed, and beneficial, now has a different look to it. We now are beginning to realize that we may need that forestland for cropland in the not-so-distant future.

Consider this Forest Service estimate of demand versus supply of softwood for the year 2,000, the right-hand figures in Table II. We are in a deficit situation, projected to become much more critical. This projection does not take into account any conversion of forest land into the production of energy from biomass or forest materials -- such as production of wood alcohols -- and that is a possibility that is growing every day as research on biomass for energy proceeds rapidly. The projected deficit in softwoods has particular significance for the South's Coastal Plain everywhere from eastern Virginia to eastern Texas because that is the southern realm of the softwoods, the pine forests. If the deficit is to be averted, altered and/or new technology in forest production must be put to work, OR -- and this a big OR -- more land area in the Coastal Plain must go into forest.

But the Coastal Plain contains what I consider to be the most important single potential for additional, future, agricultural production that the nation possesses. My estimate is that there is at least 25 million acres of Coastal Plain land under forest cover today that can support rotation cropping. Some of this land needs drainage in order to produce consistently. Some of it was cropland before 1956 that was put into pine forest under the Soil Bank. Most of it is neither drainable land nor one-time Soil Bank pineland. Instead, it is scattered throughout the Coastal Plain everywhere from southern Virginia to Texas in about every conceivable sort of setting. Some of it is in one-time large farm holdings that now are wholly forested. Some is in the holdings of
### TABLE II

**ESTIMATED SUPPLY AND DEMAND**

Softwood Timber*  
Billion Board Feet

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<tr>
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<tbody>
<tr>
<td>Total U. S. Demand</td>
<td>47.1</td>
<td>58.7</td>
<td>66.7</td>
<td>72.5</td>
</tr>
<tr>
<td>Supply from U. S. Forests</td>
<td>45.1</td>
<td>48.6</td>
<td>50.9</td>
<td>54.0</td>
</tr>
</tbody>
</table>

*Based on 1970 relative prices and management levels.

### COMMERCIAL FOREST LAND IN U. S.

Thousand Acres

<table>
<thead>
<tr>
<th></th>
<th>1963</th>
<th>1970</th>
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</thead>
<tbody>
<tr>
<td>SOUTH</td>
<td>199,906</td>
<td>192,542</td>
</tr>
<tr>
<td>WEST</td>
<td>133,142</td>
<td>129,254</td>
</tr>
<tr>
<td>NORTH</td>
<td>180,713</td>
<td>177,901</td>
</tr>
</tbody>
</table>
industrial concerns, notably the paper companies. Still more is in small to medium-sized forest tracts within working farms today. I never visit the Carolina Coastal Plain without wondering about all those modest-sized tracts of forest scattered across it, and I never travel south-central or southwestern Alabama without astonishment caused by the vast tracts of forest covering every conceivable sort of terrain and soils.

What I am attempting to delineate is a national, regional and local conflict of interests that already is with us on the Coastal Plain. It will grow more serious as time proceeds unless we face it now. On the one hand, the Coastal Plain contains a vast reserve of land of agricultural quality that is not used for agricultural purposes today. On the other the national need for more softwood production requires that the Coastal Plain produce more forest output. Place this potential competition for land within the framework of the vast expansion of metropolitanized areas along the shores of the Gulf and South Atlantic that we already have indicated is coming during the next two decades. Add to that the in-migration and growth of population in areas outside the metropolitanizing belts of the Coastal Plain -- resort growth, retirement growth, lakeside and streamside rural residential communities, and all the rest. Remember that non-metro areas are experiencing greater proportionate population growth than are metro areas. There is an impending triad of pressures on Coastal Plain land: forest use on one side, population growth on another, and the need for agricultural land on the third.

The Coastal Plain contains virtually half the South's land area. Can this conflict of interests across such a large area be resolved? I believe that it can be, but it will take some "doing" and we should start immediately.
The first step toward resolution of the conflict is information on where the land is that is of agricultural quality: we need maps that delineate these lands at large scale, such as the county level. A major step toward such information is already underway in the Soil Conservation Service in the form of their new series of maps delineating "Prime Agricultural Lands."
The first map in this series that I saw was of Peach County, in central Georgia. It displayed not only open agricultural land but other use categories such as urban-industrial, transportation uses, water and recreational areas, and woodland. What it did not delineate were those areas of agricultural quality under forest cover presently. The location and distribution of such land is information that is badly needed. The SCS already possesses the information in its Soil Surveys that is needed to identify such land. If this information could be added to the new Prime Agricultural Lands series of maps, then a tool of tremendous value could be placed in the hands of all interested parties at the local level as rapidly as the map series is produced. The Prime Agricultural Lands map series is needed quickly, all over the country.
A special Congressional appropriation just to expedite completion of the series could have many benefits. All planning and zoning and developmental workers at the community level need the sorts of information which this series contains.

Once those lands of agricultural quality that are in forest are identified, a more complex set of problems arises: that of convincing owners to revert such lands to agriculture when the forest is harvested. A program designed to accomplish this would have to extend over decades because harvesting of the forest would necessarily occur at different times in different places over many years. Among the complexities involved would be owner preferences for forest versus agriculture, absentee owners, the local availability of farmer lessors or renters to those owners no longer in the farming business, and the
costs of stumpng land once the forest is harvested. I would favor Federal
tax legislation to permit owners to deduct from income tax the cost of stump
removal after the forest harvest on land the SCS has classed as being of
agricultural quality. In other words, some assistance or incentives to shift
land into agricultural uses probably will be needed.

Another side of the coin is this: assuming that the SCS has given us a
series of county-level or community-level maps that identify the lands of
agricultural quality, how can that information be used to stop the conversion
of such lands into uses that make it impossible to reclaim the land for
agricultural purposes? I doubt the utility of legislation at the national
level in this connection. The "action" goes on at local levels, and what is
needed is protective zoning that has legal teeth in it. From what I know now,
I tend to think state-level legislation may be the best approach.

Still another aspect is the potential of many Coastal Plain areas for
enormously expanded production from land already in farms. A few examples,
now. In 1978 a certain farmer in southwestern Georgia planted two adjacent
tracts, on the same sandy soils, to soybeans. One tract was given supplemental
irrigation and produced 70 bushels; the other was not irrigated and produced
11 bushels. That's a measure of what the irregular rainfall and non-periodic
droughts of the South can do to yields, and it also underscores the value of
supplemental irrigation. With the vagaries of rainfall eliminated under
supplemental irrigation, the farmer can afford to optimize his fertilizer and
other production inputs because he is sure of his returns. Staggering yields
result. Use of center-pivot and self-propelled "big-guns" has boomed in
southwest Georgia during this decade, and 200-bushel corn yields are reported
frequently. Double-cropping is being practiced by some irrigators. Edible
pea and bean crops, vegetables, the grain crops, cotton, soybeans and
what-have-you are produced in stunning amounts when the Coastal Plain gets
that supplemental irrigation. Tobacco growers in eastern Carolina have
used a small-pond version of irrigation for the better part of two decades
with excellent results. Large operators in the alluvial Mississippi valley
also have had much success with it, and so have south Texas and some south
Florida vegetable producers. I saw 3-bale per acre cotton on irrigated
farmland near Greenville, Mississippi, twenty years ago. The value of
supplemental irrigation has been proven for a long time.

My points here are two. First, the agricultural production potential
of the Coastal Plain is far beyond present production levels when supplemental
irrigation is used. Second, we know a lot about available surface water
supplies but not enough about ground water supplies in connection with
supplemental irrigation. Widespread development of irrigation will necessitate
some sort of regulatory mechanisms in the several states to insure permanence
and equitable distribution of the water supplies.

Still another developmental prospect for agricultural lands on the
Coastal Plain -- and on the Piedmont also -- is idle land within existing
farms. This is land not in forest, not in crops, not in pasture; it's just
sitting there, doing nothing except growing weeds, bush and brush. If you
travel much across the Coastal Plain, you've seen it again and again -- in
the uplands of eastern Texas, in central Mississippi, Georgia, the Carolinas --
everywhere. Why these pieces and patches of idle land in farms? I'm sure the
answer is not poorer soil quality, but I'm less sure what the cause is. I
know that in some areas this idle land phenomenon is related to part-time
farming, but knowing that for a few places (as I do) is insufficient to generate a comprehensive answer. We don't even know how much idle land our southern farms contain. In any event, these idle acres present an obviously unused production potential.

What about the forest resource side of the competing demands on the Coastal Plain? In my opinion, the national need for softwood from the southern forest can be met from somewhat less land than is now in forest through the application of existing technology and expertise, plus some newly emerging technology. What our foresters already know about how to grow woodstuffs, but the rest of us fail to use, is amazing. It is that 145 million acres of woodland in the hands of private non-industrial landowners that contains nearly all the under-managed or non-managed forest in our area. Existing, well-known management practices could triple the output of the average privately held forest acre. So that is one obvious solution. The question is how to get the typical private owner to use the expertise of the forester on his typical small forest stand of 60 or 80 acres. Can he afford the forester's services on such a small average acreage? Can consortiums of small owners be formed on a county basis, under the leadership of county agents, to produce an aggregate forest acreage in one locality that would periodically justify the consulting services of a forester? Do you have any other ideas?

New technologies in forestry are on the way and they are highly promising. One is tissue-culture cloning of the very best individuals of a particular species. The cloning process permits extremely rapid reproduction instead of propagation from seeds in a tree nursery. Thus the very best of genetic material can be commercially available in a small fraction of the time needed heretofore. Another technology is what is called "coppice harvesting of
biomass". This procedure is the brainchild of colleagues of mine in the School of Forest Resources at the University of Georgia. It has been under development for about 15 years and I have watched it with great interest. The basic idea is to find and develop species with tremendous resprouting ability that will achieve the peak biomass, the maximum volume of woodstuffs that an acre can support, in a very short time -- such as 5 years -- instead of the 25 or 40 years that the pines need to get to peak biomass. It appears that the answer lies in sycamores and sweetgums species that resprout from roots rapidly after they are cut. In the test fields the initial plantings have been made on four-foot spacings. When about 5 years old the biomass has peaked and then the whole field is harvested with a silage forage harvester with heavy duty blades on the cylinder. Resprouting begins immediately after harvest and comes up thicker than the original stand. In another 5 years or so there is another harvest. The chopped-up biomass can go directly into manufacture of paper or paperboard, or particle board, or it may be used as an energy source through conversion to wood alcohol or through direct combustion. The energy potential in the coppice harvesting procedure has caught the interest of DOE, which has placed a 7-figure grant in the hands of the Georgia foresters to expedite their work. The "bottom line" on the outlook for the coppice harvesting technology is this: under practical field conditions it is producing eight -- repeat, eight -- times the volume of woodstuffs obtained from a characteristic stand of pine.

We have, then, the potential from both existing and emerging technology to meet the woodstuffs demands of the nation during the next several decades. But we need to find and develop the communications systems and the incentives to put the expertise our foresters are developing "into place," into operation,
at the level of the individual forest-land owner.

Changes in the agricultural scene which will protect our farmland inventory from additional declines during the years ahead will require changes in the attitudes of urbanists toward rural areas. It is sad, but true, that our urban populace simply does not realize its level of dependence upon farm and forest production. It does not comprehend the amazing growth in productivity in American agriculture during the past four decades, which is responsible for the largesse of our national agricultural supply during a period of declining farmland acres and farming population. Our city folk only dimly sense that, overall, food and fiber products are relatively inexpensive in this country. The cost-price "squeeze" that the American farmer has faced since the close of World War II they sense not at all. Indeed, in the cities the notion is widespread that each farmer has a Cadillac or two parked out back of his barn. Because the urban population is overwhelmingly preponderant, it is the dominant force in the selection-election of the Congress, and the voice of the agriculturalist carries much less weight in "Washington than in the past. Yet the interests of urban areas are intimately tied to the national rural scene. One essential part of the effort to preserve, or expand, our national agricultural inventory, in my opinion, MUST be a program to enroll the self-interests of urbanists and their Congressional representatives in protection of our farm and forest land. Farmland is somewhat like petroleum, in the sense that once it is gone there isn't any more. Farmland differs from petroleum in that it will produce indefinitely if it is retained and protected. It would seem that urbanists could understand their stake in the nation's farmland inventory if these fairly simple points are "hammered home". Cheap food and fiber are no one's "right" or
inheritance but -- for the future -- they will be available to the urban family if it actively supports the maintenance of the farmland inventory.

Anyone who thinks he can cover the manifold aspects of the agricultural land demand situation in the South in a discussion of this length is kidding himself. What I've covered is what I consider to be salient aspects, or highlights, of the situation. There is a great deal more that I trust will appear as you proceed in your meetings.

The points which I have brought to your attention are the following:

Causes of Urban Growth, which include

Industrial upsurge, and higher per capita incomes.
Mechanization of agriculture.
Population migration into the South.

Processes Whereby Rural Land is Lost, which include

Taxing the farmland as though it were not farmland.
"Beyond the fringe" suburbanization.
Growth of rural residential strips.
Activities of land speculators or developers.
Growth of the "factory in the country".
The "zone-out" process.
Formal urban absorption of rural land.
The weakness of rural zoning regulations.
Highways and other transport media as land consumers.
Effects of tax laws.
Taxation of forest lands.
Ad valorem taxation procedures in rural areas.
Federal programs that reduce the land inventory.

The impending conflicts of forest, agricultural, and urban land interests on the Coastal Plain.

The situation which you confront -- which we all confront -- in assessing the agricultural land problem is a complex of interwoven forces, pressures, demands and needs that intermesh with one another at the local level, particularly at the level of land ownership. As I've thought about all this in preparing this paper, Uncle Willie McIntire has come to mind again and again. Uncle Willie is a sweet, little retired farmer, now in his 80s, who lives about three miles east of my wife's ancestral home on her farm at the east edge of Newbern, Tennessee. Uncle Willie now is a bit dotty in the head, forgetful, and spends much of his time walking back and forth between town and his home. Everyone in the neighborhood is very fond of Uncle Willie, and all try to keep an eye on his wanderings. Early one beautiful September morning about five years ago my friend Charles Murray, who operates my wife's home farm, found Uncle Willie standing at our northwest pasture gate with a piece of rope in his hand. Willie was gazing out across the pasture when Charles drove up. Charles exchanged the usual pleasantries with Uncle Willie, and each assured the other that it was a beautiful day and that each was feeling fine. Then Charles got down to the point. "Uncle Willie," he said, "what are you doing over here at our pasture gate with that piece of rope?" Willie gazed vacantly across the pasture then turned to Charles and, smiling sweetly, said, "Do you know, Charles, I have been standing here trying to figure that out myself. I don't know whether I have found a rope or lost a calf!"
As you get down to cases in your discussions, you will confront all these intermeshing items that influence what happens to our farmland. What you confront will be something like a web of ropes that are tied together in various places. As you untie the web, I hope that each of you finds a calf at the end of your rope.
REFERENCES

1. Standard references include:


5. Prunty, op. cit., footnote 2, p. 3.

6. This calculation came from the work of Professor Ronald Boyce, of Seattle Pacific University, but to my knowledge it has not been published.


The SRDC is one of four regional rural development centers in the nation. It coordinates cooperation between the Research (Experiment Station) and Extension (Cooperative Extension Service) staffs at land-grant institutions in the South to provide technical consultation, research, training, and evaluation services for rural development. This publication is one of several published by the Center on various needs, program thrusts, and research efforts in rural development. For more information about SRDC activities and publications, write to the Director.

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