



9-1957

## Pastures and Pasture Practices

University of Tennessee Agricultural Experiment Station

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# **Pastures and Pasture Practices**

**Pastures On Haywood County, Tennessee, Farms—How  
They Were Produced And Used**

By  
**H. A. Henderson**

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## TABLE OF CONTENTS

SUMMARY .....	3
INTRODUCTION .....	5
Objectives of the Study .....	5
Location of the Area Studied .....	5
Procedure .....	6
Resources of the Brown Loam Area .....	7
THE PLACE OF PASTURES ON SAMPLE FARMS .....	8
Organization of Sample Farms .....	8
Amount and Kinds of Pasture .....	9
PASTURE PRACTICES USED .....	11
Improved Perennial Pastures .....	11
Supplementary Pastures .....	12
Aftermath Grazing .....	13
ESTIMATED ADEQUACY OF PASTURES .....	13
LIST OF AGRICULTURAL EXPERIMENT STATION LEADERS .....	15

## SUMMARY

- In the Brown Loam Area of Tennessee, farmers' experiences with commercial livestock and pasture production have been limited. However, developments in technology and changes in economic conditions are encouraging shifts from specialized cotton production to livestock systems in which cotton will be relatively less important than in the past. Therefore, pasture production should become a relatively more important segment of farm organizations in that area.
- A survey of 24 livestock farms having some improved pasture showed that 168 acres were grazed on the average farm in this sample. Slightly less than half—or 72 acres—was in perennial pasture, of which only 29 acres was classified as improved pasture. The average farm also had about 50 acres of aftermath grazing, almost 30 acres of summer and winter supplementary pasture, and 15 acres of woodland pasture.
- In general, many farmers in this sample were not following practices recommended by the College of Agriculture for establishing and maintaining the improved pastures reported on their farms. Soil was tested in only a third of the fields, but in many instances recommendations of the soil-testing laboratory were not followed. Soil amendments were used on only two-thirds of the fields during their establishment. Less than half received both lime and fertilizer during establishment. Only half of the fields were ever clipped to control weeds, and many of these were clipped only infrequently.
- Supplementary summer and winter pastures make up a large part of the pasture program. The sample farms averaged 33 acres of this type of pasture. About a third of this was for summer grazing and two-thirds were for winter grazing. Oats seeded in mixtures was the most popular supplementary pasture in both number of fields and number of acres.
- About 40 percent of the supplementary pastures were fertilized with an average of 300 pounds of 6-12-12 per acre. Ammonium nitrate was added on some fields.
- Most farmers thought that their present pasture program will be adequate for their livestock if "average" or better weather is experienced. If the weather is poor, only 15 percent of the farmers expected to have adequate pasture.

# Pastures and Pasture Practices

## Pastures on Haywood County, Tennessee Farms— How They Were Produced and Used<sup>1</sup>

H. A. Henderson<sup>2</sup>

### INTRODUCTION

#### Objectives of the Study

Livestock farming with improved practices has been suggested as a profitable farming system for the upland cotton producing areas of West Tennessee. Some factors that favor a shift to extensive enterprises, such as livestock and pasture production, are: (1) restriction of cotton acreage; (2) development of technology in cotton production that reduces costs of production in other areas more than it does in this area; (3) a rapid outmigration of labor; and (4) improvements in technology of pasture production.

**Pasture Knowledge Needed.**—If farmers are to expand livestock and pasture enterprises, they need to know about pasture capabilities and limitations, costs and returns from pastures, and risks involved in pasture establishment and maintenance.

Knowledge of the present practices and conditions on farms should help agricultural leaders plan effective pasture educational programs, and help individual farmers make an inventory of their own practices.

The specific objectives of this study were:

- (1) to describe the place of pastures in the present farm organization, and
- (2) to describe practices followed by farmers in establishing and maintaining improved perennial and supplementary pastures.

In later studies, the costs of establishing and maintaining pastures and the returns from pastures will be analyzed.

#### Location of the Area Studied

The general area selected for this study is the Grenada-Loring Soil Association Area in the southwestern part of the state. It

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<sup>1</sup>This is a part of a larger study, "Farming Adjustments in Tennessee with Emphasis on Economics of Conservation Farming."

<sup>2</sup>Agricultural Economist, Production Economics Research Branch, Agricultural Research Service, U. S. Department of Agriculture.

makes up the major part of the general area sometimes referred to as the Southern Brown Loam Area, or Type-of-Farming Area 3. The specific area studied was Haywood County in which a study of the possibilities of increasing farm incomes has been made (Figure 1).<sup>3</sup>

**A Representative Area.**—Haywood County appears to be representative of the Grenada-Loring soil association area with respect to general agriculture and pasture problems. Improved pasture would be an important enterprise in many of the profitable alternative farming systems in this area. Therefore, a study about present pastures and pasture practices there should be useful in understanding some of the problems associated with developing pastures in alternative systems of farming in that general soil area.

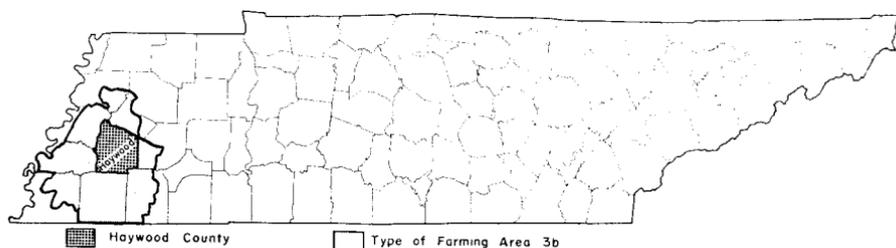


Figure 1. Location of Type of Farming Area 3 and Haywood County, Tennessee

### Procedure

Information on pasture practices, land uses, and livestock numbers were obtained by personal interview with 24 farm operators who reported having improved perennial pastures during the year beginning April 1, 1954. These farmers interviewed were selected from a list suggested by the County Agricultural Agent and other professional agricultural workers in Haywood County as having important commercial livestock enterprises and possibly having improved pastures. Twenty-nine of the approximately 40 farmers listed were interviewed; five reported no improved pasture. Only 43 farms in Haywood County reported any improved pasture in the Census of Agriculture for 1954.

**Improved Pasture Defined.**—For this study a pasture was considered to be improved if the farmer considered it to be improved and one or more of the following practices had been used: seeding

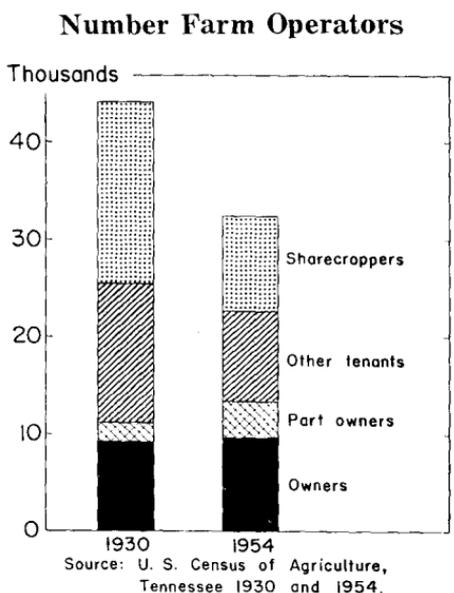
<sup>3</sup>Whatley, Thomas J., and Samuel W. Atkins. Increasing Incomes Through Farm Adjustments in the Grenada-Loring Soil Association Area of West Tennessee, Tennessee Agricultural Experiment Station Bulletin No. 244, December 1955. Many comments in the introduction to this report are based on this work.

to recommended specie or species of pasture plants, fertilizing, or liming. This definition is somewhat similar to the definition used in the 1954 Census of Agriculture. <sup>4</sup>

The records obtained from the farmers interviewed covered the general farm organization and operations of the farms, with particular emphasis on the pasture and livestock programs. Livestock kept and livestock production, feeds fed, and pasture management and use were described in detail.

### Resources of the Southern Brown Loam Area

In the Southern Brown Loam Area, the per capita farm income is about equal to that of other Tennessee farmers, but it is only one-third that of the average for farmers in the U. S. The investment per person is about half that of the average U. S. farmer. Incomes of farmers in the area have increased only 1 percent per year since 1910 compared with about a 3 percent annual increase for the average U. S. farmer.



**Figure 2. Number of Farm Operators, by Tenure, Southern Brown Loam Area of West Tennessee, 1930 and 1954.**

groups—sharecroppers declined by 44 percent and other tenants by 38 percent. Full owners increased 3 percent, but part owners more than doubled; that is, their numbers increased by 110 percent (Figure 2). Of the net reduction, about three-fifths occurred during the last 5 years of this period. Most of this loss was in the sharecropper group.

The relatively small income of farmers in the area is obtained almost exclusively from production of cotton. If the trend toward relatively lower acreages of cotton continues, many resources are likely to be left idle, unprofitably employed, or available for other uses.

**Fewer Laborers.**—The labor force in the area is decreasing as indicated by a decline of 25 percent in the number of farm operators from 1930 to 1955. The reductions occurred in the tenant

<sup>4</sup>For census purposes, improved pasture "includes land in 'other' pasture other than cropland and woodland on which one or more of the following practices had been used: Liming, fertilizing, seeding to grasses or legumes, irrigating, draining, or controlling weeds and brush." 1954 Census of Agriculture, Vol. II, General Report, Page 10. ("Other" pasture referred to above is pasture that farmers did not consider as cropland or woodland pasture.)

A net outmigration of two persons occurred for each person born on farms in the East South Central States from 1949 to 1954.<sup>5</sup> Farmland per farm person in the area increased almost 50 percent from 1930 to 1950 (from 10.5 to 15.5 acres). Ten percent of the cropland was idle in 1950. If this exodus of labor continues and restrictions on the acreage of cotton are continually tightened, the idle cropland can be expected to increase unless some extensive enterprise such as forage production can be introduced to utilize this land.

Except for home use and in the immediate vicinity of Memphis, very few livestock are in the area. In 1954, the average farmer had less than five head of cattle and about one brood sow. Because of the small amount of livestock, pastures are relatively unimportant in the area. Only 43 farms in Haywood County reported improved pastures in the agricultural census of 1954.

In the state as a whole, the importance of pasture in the livestock program is indicated in a recent report in which it is estimated that about 37 percent of the feed requirements of all livestock in Tennessee were furnished by pasture in 1945-50.<sup>6</sup> By classes of livestock in Tennessee, the percentage of nutrients furnished by pasture were:

Dairy cattle.....	45	Sheep and goats.....	82
Beef cattle .....	71	Horses and mules.....	47

## THE PLACE OF PASTURES ON SAMPLE FARMS

### Organization of Sample Farms

**Size.**—Farms in the sample studies were a little more than twice as large as the average farm in the Brown Loam Area. The sample farms averaged about 215 acres per farm while farms in the area averaged about 100 acres.<sup>7</sup> Farms in the sample ranged in size from 57 to 734 acres.

**Crops and Livestock.**—The cropping system on sample farms is typical of the larger farms in the area. Cotton and corn are the

<sup>5</sup>Computed from data in *Farm Population Migration to and from Farms, 1920-54*, U. S. Department of Agriculture, AMS-10, 1954.

<sup>6</sup>R. D. Jennings, *Relative Use of Feeds for Livestock, Including Pasture, by States*, U. S. Department of Agriculture, Agricultural Research Service Statistical Bulletin No. 153, 1954.

<sup>7</sup>A farm as defined for this purpose is a unit of land on which the operator does the planning, furnishes the supervision, owns the power and equipment, and provides the labor force. Sharecroppers are considered as parts of the labor force on farms as defined.

predominant cultivated crops; hay and pasture occupy important places in the land-use pattern. The sample farms, however, have more livestock than the average farm in the area. The sample farms averaged 18 beef cows, 2 brood sows, and 3 milk cows per farm in 1955 (Table 1).

Table 1. *Land Use and Livestock Kept Per Farm, 24 Farms With Improved Pastures, Haywood County, Tennessee, 1955*

Item	Average number
<b>LAND AND CROPS</b>	
	<u>Acres</u>
Cotton .....	32.9
Corn .....	23.3
Lespedeza hay .....	15.7
Temporary pasture .....	16.3
Other crops .....	25.5
Total in crops .....	113.7
Double cropped .....	16.9
Used for crops .....	96.8
Idle cropland and failure .....	3.0
Woodland pasture .....	15.0
Unimproved pasture .....	43.0
Improved pasture .....	29.2
Other land .....	27.4
Total land .....	214.4
<b>LIVESTOCK</b>	
	<u>Head</u>
Milk cows .....	3.0
Beef cows .....	18.5
Brood sows .....	2.3
Hens .....	96.0
Workstock .....	2.5

The 24 farmers with improved perennial pastures had 43 fields of improved pasture. This was an average of 1.8 fields, or 29 acres per farm. In addition, 80 percent of the farms had some unimproved pastures which averaged 33 acres per farm.

### Amount and Kinds of Pasture

The sample farms had an average of 168 acres of various kinds of pasture per farm in 1955. Less than half of this acreage was in perennial pasture. About a sixth of the grazed acreage was in supplementary pastures, and about 40 percent was in woodland and aftermath grazing (Table 2).

Table 2. *Types of Pasture, 24 Farms With Improved Perennial Pastures, Haywood County, 1954-55*

Type of pasture	Number of farms reporting pasture	Percentage of total acres grazed	Average number of acres per farm
Perennial .....	24	43	72
Improved .....	(24)a	(17)	(29)
Unimproved .....	(18)a	(26)	(43)
Supplementary b .....	21	17	29
Aftermath .....	18	31	52
Woodland .....	11	9	15
Total .....	xx	100	168

a—Eighteen of the farms surveyed had both improved and unimproved pasture.

b—Includes temporary pasture plus crops produced for other purposes but which were used primarily for grazing.

**Species Sown.**—Twenty-one farms had 40 fields of supplementary pastures for an average of 33 acres per farm. For this study, supplementary pastures are defined as either summer or winter pastures usually seeded to add to the grazing provided by perennial, or permanent pastures. Species used were primarily oats and ryegrass alone or in combination with vetch or crimson clover for winter and lespedeza for summer pastures (Table 3). Oats in combination with other crops made up more than half of the winter pastures. Vetch was the most popular winter legume in terms of acreage. Lespedeza made up almost 90 percent of the summer pasture acreage.

Table 3. *Crops Used for Supplementary Pasture, 40 Fields, Haywood County, 1954-55*

Species	Seeded alone		Seeded in mixture <sup>a</sup>		Total <sup>a</sup>	
	Fields	Acres	Fields	Acres	Fields	Acres
<b>Winter crops:</b>						
Oats .....	4	46	11	245	15	291
Ryegrass .....	3	49	5	58	8	107
Rye .....	1	4	3	55	4	59
Crimson Clover .....	1	3	6	63	7	66
Vetch .....	0	0	7	205	7	205
Wheat .....	0	0	1	100	1	100
Total winter .....	9	102	16	313	25	415
<b>Summer crops:</b>						
Lespedeza .....	10	213	0	0	10	213
Soybeans .....	3	20	0	0	3	20
Sudan grass .....	2	8	0	0	2	8
Total summer .....	15	241	0	0	15	241

a—One field had oats, vetch, and wheat. Others had two kinds, usually one legume and one nonlegume. Totals have been adjusted for duplication.

**PASTURE PRACTICES USED****Improved Perennial Pastures**

Farmers, in general, did not use practices recommended by the College of Agriculture in establishing or maintaining improved perennial pastures. Farmers tested soil from only a third of their fields, but they followed recommendations on only two-thirds of the fields that were tested. When establishing pastures, farmers applied fertilizer to about half the fields and lime to about half. However, they applied both lime and fertilizer to only 37 percent of the fields (Table 4).

*Table 4. Use of Specified Practices in Establishing and Maintaining 43 Fields of Improved Perennial Pasture, Haywood County, Tennessee, 1954-55*

<b>Item</b>	<b>Number of fields</b>	<b>Percentage of all fields</b>
Number of fields .....	43	100
Year seeded:		
1949 and before .....	9	21
1950 .....	3	7
1951 .....	7	16
1952 .....	6	14
1953 .....	3	7
1954 .....	12	28
1955 (before April) .....	3	7
Total .....	43	100
Establishing practices:		
Soil Tested .....	14	33
Soil test recommendations followed .....	10	23
Use of soil amendments:		
Lime and fertilizer .....	16	37
Fertilizer only .....	5	12
Lime only .....	6	14
None .....	16	37
Total .....	43	100
Maintenance practices:		
Reseeding .....	15	34
Clipping .....	23	53
Soil amendments .....	14	33

**Establishment Practices.**—On a third of 21 fields fertilized when established, farmers applied farm-mixed fertilizer at rates ranging from 375 pounds to 1 ton per acre. The average analysis was close to a 5-12-6 mixture. On a fourth of the fields, a 6-12-12 mixture was used at an average rate of 270 pounds per acre (Table 5). Other fertilizers used, as reported, were 3-12-12 and

0-20-0 mixtures. The kind of fertilizer and rates of application were not reported for 6 of the 21 fields.

**Maintenance Practices.**—Farmers applied soil amendments for maintenance on only a third of the fields and they clipped weeds on only half of the fields at any time (Table 4). Those that were clipped were clipped only infrequently.

Generally the maintenance applications were made to fields on which no fertilizer or lime had been applied when the pasture was established. The applications usually were ammonium nitrate or a 6-12-12 analysis applied at the rate of 100 to 150 pounds per acre.

Table 5. *Kind and Amount of Soil Amendments Used Per Acre in Establishing Perennial Pastures, Haywood County, Tennessee, 1954-55*

Item	Number of fields on which materials were used	Total amount of materials used		Pounds of nutrients used		
		Average per acre	Unit	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
Lime .....	22	2.3	Ton	xx	xx	xx
Fertilizer:						
Mixed by farmers .....	7	840 <sup>a</sup>	Lb.	45	115	60
6-12-12 .....	5	270	Lb.	16	32	32
3-12-12 .....	1	800	Lb.	24	96	96
0-20-0 .....	2	250	Lb.	0	50	0
Analysis unknown .....	1	300	Lb.	N.A.	N.A.	N.A.
Analysis and rate unknown ....	5	N.A. <sup>b</sup>	Lb.	N.A.	N.A.	N.A.
Total reporting fertilizer used ....	21	xx	xx	xx	xx	xx

a—Five farms averaged 575 pounds per acre ranging from 375 pounds to 800 pounds, and two farms averaged 1,500 pounds per acre, or 1,000 and 2,000 pounds each.

b—N.A.—Not ascertainable.

### Supplementary Pastures

About 40 percent of the fields of supplementary pastures were fertilized. All except one of those fertilized pastures received applications of a 6-12-12 fertilizer. In addition, ammonium nitrate was used on a few of these fields. The amount of 6-12-12 fertilizer ranged from 80 to 400 pounds per acre, averaging about 300 pounds.

Seedbeds were prepared on 87 percent of the fields. Some pasture seeding was done during eight different months of the year (Table 6). Summer crops were seeded during the recommended months, such as lespedeza in March and April and sudan grass in June. On the other hand, many fall-seeded crops were seeded later than recommended. Some ryegrass was seeded in November and December, while the latest recommended date is October 20. Several fields of oats and certain other winter crops

were seeded in October and November, while it is recommended that if practicable they be seeded before October 1.<sup>8</sup>

*Table 6. Month of Seeding Supplementary Pastures, 24 Farms with Improved Pastures, Haywood County, 1954-55*

Month	Percentage of fields established	
	Summer crops	Winter crops
March .....	33 <sup>a</sup>	
April .....	33 <sup>a</sup>	
June .....	34 <sup>b</sup>	
August .....		10
September .....		33
October .....		42
November .....		10
December .....		5
Total .....	100	100

a—Lespedeza.

b—Sudan.

On some farms, winter supplementary pastures were grazed from November until May, but on most farms they were grazed only from January through March. Some fields of summer supplementary pastures were grazed in each month of the year, but it is doubtful whether much grazing was obtained during the winter. Most of these pastures were grazed only from June to September, inclusive.

### Aftermath Grazing

Most stalk fields were grazed after crops were harvested. Oats that were raised primarily for grain provided some grazing on a third of the farms. The acreage of land grazed as aftermath varied inversely with the number of acres of supplementary pasture. Probably farmers who used supplementary winter pastures did not have enough time to graze stalk land before they seeded their winter pastures. The recommended seeding dates for most winter pastures occur before the usual time for harvesting cotton and corn. Exceptions are crops harvested for silage or very early corn for grain.

### ESTIMATED ADEQUACY OF PASTURES

**Pasture Expectation.**—The majority of farmers interviewed believe that their present livestock pasture ratio is about as it should be for “average” or “ideal” weather. Only 15 percent of these farmers believe that their pastures will be adequate for their present livestock program if weather is “poor” (Table 7).

Only 4 percent of the farmers considered their pastures inadequate to meet their needs if "ideal" or "average" weather occurs.

Before a farmer can be expected to adjust his quantity of pasture, acreage or practices, he should change his ideas about how much his pasture will contribute to the efficiency of the livestock enterprise, or to farm income.

*Table 7. Farmers' Estimates of Adequacy of Pastures, by Weather Conditions 24 Farms, Haywood County, Tennessee, 1954-55*

Weather	Adequacy of pastures		
	Not enough	Adequate	Excess
	Percent of farms		
Ideal .....	0	62	38
Average .....	4	92	4
Poor .....	85	15	0

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