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FOREWORD

The Georgia Experiment Station is frequently called upon by agencies, groups, and individuals to give advice on practices connected with the production of the various crops produced in the State.

Information is also needed to furnish basic data for research studies of adjustments on farm organization. Consequently, during the summer of 1948, a study was initiated for the purpose of obtaining up-to-date information on crop production practices in the major type-of-farming areas of Georgia.

Field data have been collected for a number of crop enterprises and separate reports for each will be issued as they are completed.

The results of this study for annual lespedeza in the Piedmont are presented in this report. Other reports issued to date are as follows:

- Mimeo Series 12. Pimiento Peppers - Piedmont
- Mimeo Series 17. Tobacco - Lower Coastal Plain
- Mimeo Series 18. Pimiento Peppers - Coastal Plain
- Mimeo Series 19. Cotton - Limestone Valley
- Mimeo Series 20. Wheat - Piedmont
- Mimeo Series 25. Cotton - Piedmont
- Mimeo Series 27. Cotton - Lower Coastal Plain
- Mimeo Series 28. Peanuts - Coastal Plain
- Mimeo Series 29. Oats - Piedmont
- Mimeo Series 30. Okra - Coastal Plain
- Mimeo Series 32. Cotton - Upper Coastal Plain
- Mimeo Series 43. Snap Beans - Coastal Plain
- Mimeo Series 44. Sericea Lespedeza - Piedmont
- Mimeo Series 45. Tomatoes - Coastal Plain
- Mimeo Series 46. Lima Beans - Coastal Plain
- Mimeo Series 47. Cantaloupes - Coastal Plain
- Mimeo Series 48. Irish Potatoes - Coastal Plain
- Mimeo Series 49. Sweet Corn - Coastal Plain
- Mimeo Series 50. Watermelons - Coastal Plain
- Mimeo Series 51. Cucumbers - Coastal Plain
- Mimeo Series 52. Cabbage - Coastal Plain
- Mimeo Series 53. Blue Lupine - Coastal Plain
- Mimeo Series 54. Alfalfa - Limestone Valley
- Mimeo Series 55. Onions - Coastal Plain
- Mimeo Series 56. Corn - Limestone Valley, Piedmont, and Coastal Plain

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ANNUAL LESPEDEZA PRODUCTION PRACTICES AND COSTS IN THE PIEDMONT OF GEORGIA

C. C. Taylor and J. C. Elrod

INTRODUCTION

The primary objective of this report is to present background information on practices and costs applicable to the production of annual lespedeza in the Piedmont section of Georgia.

The information on which this report is based was obtained by personal interviews with farmers selected at random in Barrow, Clarke, Floyd, Green, Jackson, Madison, Newton, Oglethorpe, Pike, Spalding, and Walton counties. The sequence and kinds of operations, labor requirements, and material inputs vary from one farm to another. The data are averages of actual experiences observed on the sample farms and should be fairly typical of production practices and costs in all similar cases. Labor requirements and costs are shown separately for farms on which mule power was used and for those on which tractor power was used. Labor requirements and costs are also shown separately for lespedeza production for hay and lespedeza production for seed.

GENERAL CHARACTERISTICS

Annual lespedezas are fine-stemmed, low growing, leafy legumes which are adapted to all Georgia soil types except the sands. There are two species of annual lespedeza. Kobe (a variety of one species) has relatively small leaves, large seed, and is late maturing. Korean (a variety of the second species) has relatively large leaves, small seed, and is earlier maturing. Lespedeza is grown in Georgia for grazing, hay, soil improvement, and seed. Annual lespedezas will usually reseed themselves and are sometimes left on the same land for several years.

Kobe was the variety most commonly grown on the farms surveyed. Of all farmers interviewed, 76 percent reported use of Kobe lespedeza, 8 percent reported Korean lespedeza, and 16 percent were unable to identify the lespedeza which they planted.

Lespedeza is most commonly interplanted with small grains, although it is sometimes planted alone. When planted with small grain, it is usually seeded in the spring on top of the grain. On the sample farms, 88.1 percent of the total lespedeza acreage was interplanted with small grains, and 11.9 percent was planted alone after either cotton, corn, or previous lespedeza crops. On farms on which mule power was used, 45 percent of the total lespedeza acreage was cut for hay, 19.3 percent was harvested for seed, and 31.5 percent was turned under for soil improvement. Only 7.0 percent of the total acreage was left to reseed itself. On farms on which tractor power was used, 28.4 percent of the total lespedeza was cut for hay, 40.1 percent was harvested for seed, 27.3 percent was turned under, and 4.2 percent was left to reseed itself. Many farmers reported that their lespedeza acreage was grazed, especially that which was not harvested for either hay or seed.

USUAL PRODUCTION PRACTICES

The usual operations and equipment presented in Table 1 were selected from all actual operations and equipment listed in Appendix Table 1. The operations, and the equipment with which they were performed, were selected on the basis of most common usage. Lespedeza was ordinarily interplanted with small grains on both groups of farms.

Table 1. Annual Lespedeza: Usual Operations and Equipment, by Type of Power Used, in the Piedmont of Georgia

Operations	Equipment used	
	Mule-power farms	Tractor-power farms
Land preparation and planting:		
Sow seed	: Cyclone seeder	: Cyclone seeder
Cover seed	: Drag harrow, 2-mules	: Drag harrow, tractor
Harvest for hay: *		
Mow hay	: Mower, 2-mules	: Mower, tractor
Rake hay	: Dump rake, 2-mules	: Side-delivery rake, tractor
Bale hay	: -	: Pick-up baler, tractor
Haul hay	: Wagon, 2-mules	: Truck
Harvest for seed: *		
Combine seed	: Combine, tractor <u>1/</u>	: Combine. tractor
Haul seed	: Truck	: Truck

* Alternative operations.

1/ Included with mule-power farms because this was frequently a custom operation.

Mule-Power Farms. On farms using mule power, the operations usually performed in producing lespedeza for hay were as follows: sow and cover seed, and mow, rake, and haul hay. When lespedeza was harvested for seed, operations performed after sowing and covering seed were combining and hauling seed. Lespedeza seed were sown with a hand-operated cyclone seeder and covered with a drag harrow drawn by two mules. Lespedeza harvested for hay was mowed with a mule-drawn mower and raked with a mule-drawn dump rake. The loose hay was hauled in a mule-drawn farm wagon. Lespedeza harvested for seed was combined with a tractor-power combine by custom operators. The seed were hauled from the field in a truck.

Tractor-Power Farms. On farms using tractor power, the operations performed in producing lespedeza for hay were as follows: sow and cover seed, and mow, rake, bale and haul hay. Seed were sown with a hand-operated cyclone seeder and covered with a tractor-drawn drag harrow. Hay was mowed with a tractor-powered mower and raked with a tractor-powered side-delivery rake. On tractor-power farms, hay was baled by a pick-up baler, whereas it was hauled loose on mule-power farms. The baled hay was hauled from the field in a farm truck.

Lespedeza was harvested for seed by the same operations and in the same manner as seed were harvested on mule-power farms.

VARIATIONS FROM THE USUAL METHODS OF PRODUCTION

Operations performed in producing lespedeza, and the methods by which they were performed, varied from one sample farm to another. A complete summary of these variations may be made by a comparison of the usual operations listed in Table 1 with all actual operations performed on all sample farms as listed in Appendix Table 1.

Although lespedeza was ordinarily interplanted with small grains, it was sometimes planted alone. When lespedeza was interplanted with small grains, no land preparation was necessary since the seed bed had already been prepared for the grain. When lespedeza was planted alone, seed bed preparation was necessary. Operations performed in preparing such a seed bed included eliminating stalks from previous crops, breaking and harrowing land. Mule-drawn listers were used to rip up stalks from previous crops. Mule-drawn bottom plows and tractor-drawn disk plows were used for breaking land. For harrowing land, both mule-drawn and tractor-drawn drag harrows, as well as tractor-drawn disk harrows, were used. Some farmers sowed lespedeza seed with a tractor-drawn grain drill, and a few used a tractor-drawn lime spreader.

Although the application of lime and phosphate to lespedeza acreage was not found to be a common practice, some farmers applied one or the other and a few farmers applied both. Phosphate was applied with either a lime spreader or grain drill, and lime was ordinarily applied by truck.

Some farmers clipped weeds on their lespedeza acreage with either a mule-drawn or tractor-powered mower. A few farmers raked lespedeza hay with a tractor-drawn dump rake. Some hay was baled with a stationary tractor powered baler. Although either a mule-drawn wagon or a farm truck was ordinarily used for hauling, tractor-drawn trailers were used on some farms.

Lespedeza was usually harvested for either hay or seed, although some was left unharvested to be turned under for soil improvement or to reseed itself. Much of the unharvested lespedeza was grazed. Some of the acreage which was harvested was grazed previous to harvest time.

DATES OF PERFORMING USUAL OPERATIONS

The periods during which the usual operations were performed in producing lespedeza are presented graphically in Figure 1. Seed were usually sowed and covered during the first three weeks of March, although some were sowed as early as the first of February and some as late as the middle of April. Lespedeza for hay was usually harvested between August 15 and September 25. However, some hay harvesting began the first of August, and some harvesting was completed as late as October 25. Hay was hauled from the field shortly after being mowed and raked.

Lespedeza seed were ordinarily harvested between October 15 and November 15, although some were harvested as early as October 1 and some as late as December 25.

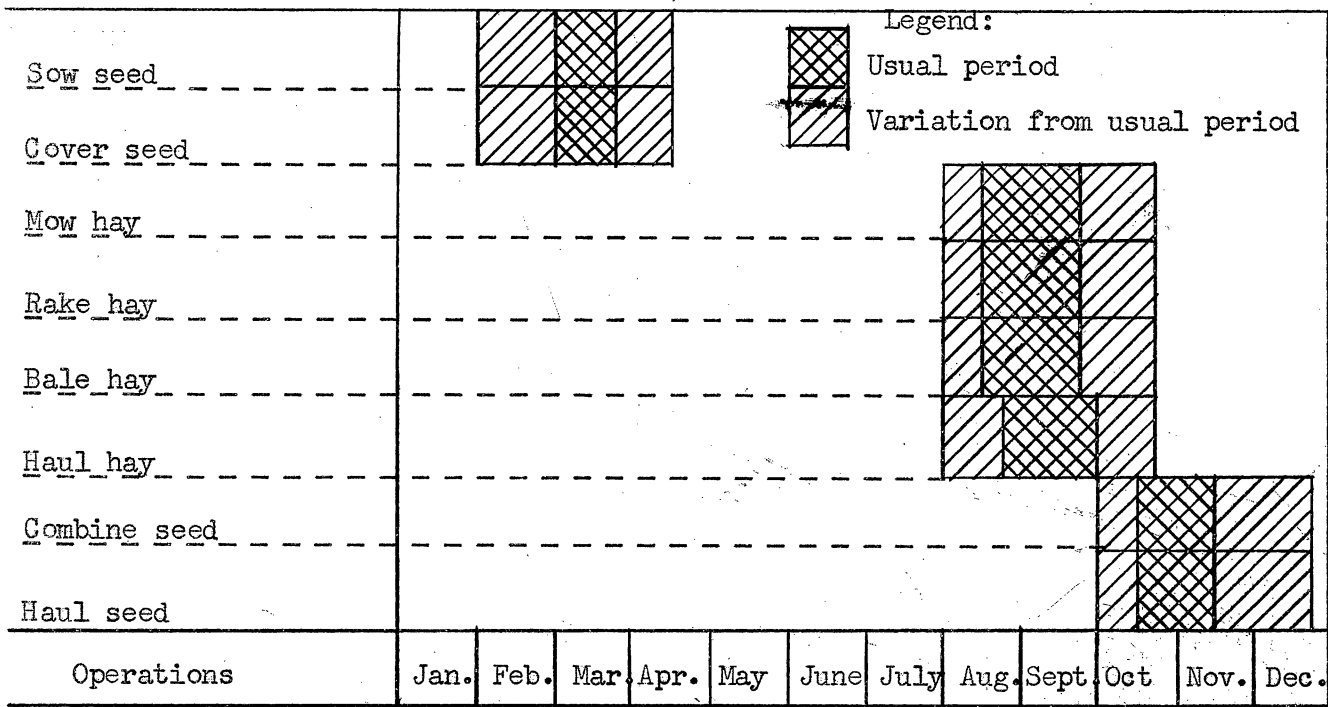


Figure 1. Annual Lespedeza: Usual Operations and Dates Performed in the Piedmont Section of Georgia

LABOR AND POWER REQUIRED PER ACRE

Labor and power requirements for producing lespedeza for hay and for seed are given in Tables 2 and 3. On the basis of operations usually performed, 7.2 man hours and 9.7 mule hours were required to produce an acre of lespedeza hay on farms using mule power. On farms using tractor power, 5.6 man hours, 2.6 tractor hours, and 0.6 truck hour were required per acre. Hauling hay required the greatest input of man labor. This operation required 50.0 percent of the total man labor requirement on mule-power farms and 35.7 percent on tractor-power farms.

Labor and power requirements for all operations except hauling hay were relatively evenly distributed. Mechanization of power, of course, eliminated the mule work requirement and reduced the man labor requirement. Although the per acre yields of hay were somewhat higher on tractor-power farms, fewer man hours of labor were required to haul the baled hay on these farms than were required to haul the loose hay on mule-power farms.

Table 2. Annual Lespedeza: Labor and Power Required Per Acre by Type of Power Used for Hay Production in the Piedmont of Georgia

Operations	Mule power farms			Tractor power farms		
	Hours per acre			Hours per acre		
	Man	Mule	Tractor	Man	Mule	Tractor
Sow seed	0.7	-	-	0.7	-	-
Cover seed	1.0	2.0	-	0.6	-	0.6
Mow hay	1.1	2.2	-	0.9	-	0.9
Rake hay <u>1/</u>	0.8	1.6	-	0.6	-	0.6
Bale hay <u>1/</u>	-	-	-	0.8	-	0.5
Haul hay <u>1/</u>	3.6	3.9	-	2.0	-	0.6*
Total	7.2	9.7	-	5.6	-	3.2 <u>2/</u>

* Hours of truck use.

1/ Based on an average yield of 1,680 pounds of hay on mule-power farms and 2,300 pounds on tractor-power farms.

2/ Truck hours included.

Table 3. Annual Lespedeza: Labor and Power Required Per Acre by Type of Power Used for Seed Production in the Piedmont of Georgia

Operations	Mule power farms			Tractor power farms		
	Hours per acre			Hours per acre		
	Man	Mule	Tractor	Man	Mule	Tractor
Sow seed	0.7	-	-	0.7	-	-
Cover seed	1.0	2.0	-	0.6	-	0.6
Combine seed	1.7	-	0.9	1.7	-	0.9
Haul seed	0.2	-	0.1*	0.2	-	0.1*
Total	3.6	2.0	1.0 <u>1/</u>	3.2	-	1.6 <u>1/</u>

* Hours of truck use.

1/ Truck hours included.

On the basis of operations usually performed, 3.6 man hours, 2.0 mule hours, 0.9 tractor hour, and 0.1 truck hour were required to produce and harvest an acre of lespedeza for seed on mule-power farms. On tractor-power farms, 3.2 man hours, 1.5 tractor hours, and 0.1 truck hour were required. Labor and power requirements for seed production are relatively low. Combining seed required the largest input of man labor.

PRODUCTION COSTS

Usual items of cost in the production of lespedeza for hay on the sample farms included seed, man labor, mule work, tractor use, equipment charge, and land charge (Table 4). Cost of seed constituted the largest single production cost on mule-power farms. Equipment charge exceeded the cost of seed on tractor-power farms. This was caused by the use of tractor-powered equipment and the use of additional equipment for baling hay.

Table 4. Annual Lespedeza: Usual Inputs and Cost Per Acre for Hay Production by Type of Power Used in the Piedmont of Georgia

Item	Unit	Rate ^{1/}	Mule power farms		Tractor power farms	
			Amount	Cost	Amount	Cost
Seed	pound	0.14	35.7	5.00	41.2	5.77
Man labor	hour	0.30	7.2	2.16	5.6	1.68
Mule work	hour	0.25	9.7	2.43	-	-
Tractor use	hour	0.48	-	-	2.6	1.25
Equipment charge ^{2/}				1.24		6.88
Land charge ^{3/}				2.50		2.50
Total				13.33		18.08

^{1/} Cost rates are based on average for all sample farms.

^{2/} Includes truck cost

^{3/} Proportionate part for lespedeza interplanted with small grain.

Seed planted per acre varied from 20 to 50 pounds and averaged 35.7 pounds on farms using mule power. On tractor power farms, the rates of seeding varied from 30 to 75 pounds and averaged 41.2 pounds per acre. Seed were purchased for prices which averaged 14 cents per pound.

The total cost of producing and harvesting one acre of loose lespedeza hay on mule-power farms was \$13.33. On tractor-power farms, the total cost of producing and harvesting an acre of baled lespedeza hay was \$18.08.

The cost of producing and harvesting lespedeza for seed is given in Table 5. Seed cost and land charge were the same as they were for the production of hay. Cost of man labor, mule work, tractor use, and equipment charge varied with the methods and equipment used in harvesting lespedeza for seed. The total cost of producing and harvesting an acre of lespedeza seed was \$11.11 on mule power farms and \$11.49 on tractor-power farms.

Table 5. Annual Lespedeza: Usual Inputs and Cost Per Acre for Seed Production, by Type of Power Used in the Piedmont of Georgia

Item	Unit	Rate ^{1/}	Mule power farms		Tractor power farms	
			Amount	Cost	Amount	Cost
Seed	pound	0.14	35.7	5.00	41.2	5.77
Man labor	hour	0.30	3.6	1.08	3.2	.96
Mule work	hour	0.25	2.0	.50	-	-
Tractor use	hour	0.48	0.9	.43	1.5	.72
Equipment charge ^{2/}				1.60		1.54
Land charge ^{3/}				2.50		2.50
Total				11.11		11.49

^{1/} Cost rates are based on average for all sample farms.

^{2/} Includes truck cost.

^{3/} Proportionate part for lespedeza interplanted with small grain.

Since the common practice on the surveyed farms was to seed lespedeza on top of small grain, no charge for fertilizer has been included in costs of producing lespedeza hay or seed. It was, however, a usual practice on these farms to fertilize the small grain with both a complete and nitrogenous fertilizer. The lespedeza, of course, received some benefit from this fertilization. Whether greater amounts of fertilizer were applied to small grain when interplanted with lespedeza than when planted alone was not determined. A few farmers, however, reported the use of lime and phosphate specifically for the benefit of their lespedeza. Six percent of the farmers in each group reported the use of lime,

10.

and 25 percent of the farmers using tractor power reported the use of superphosphate. This practice is in accordance with the latest recommendations and the results are reflected in the reported yields. On mule-power farms, yields of hay averaged 1,680 pounds per acre and seed yields averaged 218 pounds per acre. On tractor power farms where a larger percentage of producers used superphosphate, yields of hay averaged 2,300 pounds per acre and seed yields averaged 287 pounds per acre.

APPENDIX

Table 1. Annual Lespedeza: Proportion of Farms Reporting Various Operations Performed and Times Over for All Sample Farms by Type of Power Used in the Piedmont Section of Georgia

Operation and power and equipment used	Mule (essentially)			Tractor (essentially)		
	Proportion of farms reporting	of planted acres covered	Times over	Proportion of farms reporting	of planted acres covered	Times over
	percent	percent	No.	percent	percent	No.
Land preparation and seeding:						
Rip stalks	(6)	(1)				
Middle buster, 2-mules	6	1	1.00	-	-	-
Break land	(6)	(1)		(6)	*	
Bottom plow, 2-mules	6	1	1.00	-	-	-
Disk plow, tractor	-	-	-	6	*	1.00
Harrow land, disk				(12)	(5)	
Disk harrow, tractor	-	-	-	12	5	1.76
Harrow land, drag	(6)	(1)		(6)	(4)	
Drag harrow, 2-mules	6	1	1.00	-	-	-
Drag harrow, tractor	-	-	-	6	4	1.00
Seed	(100)	(100)		(100)	(100)	
Hand, cyclone seeder	100	100	1.00	62 ¹ / ₂	54	1.00
Grain drill, tractor	-	-	-	34 ¹ / ₂	39	1.00
Lime spreader, tractor	-	-	-	6 ¹ / ₂	7	1.00
Cover seed	(50)	(40)		(50)	(38)	
Drag harrow, 2-mules	38	32	1.00	-	-	-
Drag harrow, 1-mule	6	2	1.00	-	-	-
Drag harrow, tractor	6	6	1.00	47	37	1.00
Disk harrow, tractor	-	-	-	3	1	1.00
Spread phosphate				(25)	(28)	
Lime spreader, tractor	-	-	-	19	22	1.00
Grain drill, tractor	-	-	-	6	6	1.00
Spread lime	(6)	(9)		(6)	(9)	
Truck	6	9	1.00	6	9	1.00
Clip weeds	(6)	(2)		(38)	(36)	
Mower, 2-mules	6	2	1.00	3	7	1.00
Mower, tractor	-	-	-	35	29	1.00
Mow hay	(62)	(39)		(56)	(26)	
Mower, 2-mules	56	38	1.00	-	-	-
Mower, tractor	6	1	1.00	56	26	1.00
Rake hay	(62)	(39)		(56)	(26)	
Dump rake, 2-mules	62	39	1.00	12	7	1.00
Dump rake, tractor	-	-	-	6	1	1.00
Side-delivery rake, tractor	-	-	-	38	18	1.00
Bale hay				(41)	(19)	
Stationary baler, tractor	-	-	-	7	3	1.00
Pick-up baler, tractor	-	-	-	34	16	1.00

APPENDIX

Table 1. Continued.

Operation and power and equipment used	: Mule (essentially)			: Tractor (essentially)		
	:Proportion:			:Proportion:		
	:Proportion:	:of planted:	:Times:	:Proportion:	:of planted:	:Times:
	: of farms	: acres	: over	: of farms	: acres	: over
: reporting:	: covered	:	: reporting:	: covered	:	
: percent	: percent	: No.	: percent	: percent	: No.	
Haul loose hay to barn	(62)	(39)	:	(16)	(7)	:
Wagon, 2-mules	50	31	1.00	4	2	1.00
Truck	12	8	1.00	-	-	-
Trailer, tractor	-	-	-	12	5	1.00
Haul baled hay to barn	:	:	:	(41)	(19)	:
Trailer, tractor	-	-	-	6	2	1.00
Truck	-	-	-	35	17	1.00
Combine	(31)	(27)	:	(56)	(39)	:
Combine, tractor	31	27	1.00	56	39	1.00
Haul seed to barn	(31)	(27)	:	(56)	(39)	:
Trailer, tractor	-	-	-	6	6	1.00
Truck	31	27	1.00	50	33	1.00
Graze	:	:	:	(12)	(4)	:
Left on land	(31)	(7)	:	(9)	(4)	:
Turn under	(31)	(28)	:	(22)	(27)	:
Bottom plow, 2-mules	31	28	1.00	-	-	-
Disk tiller, tractor	-	-	-	16	24	1.00
Bush and bog harrow, tractor:	-	-	-	6	3	1.00

* Less than one percent.

1/ Will add to more than the percentage figure for the operation since some farmers used more than one type of equipment in performing the operation.

APPENDIX

Table 2. Annual Lespedeza: Average Labor Used Per Acre One Time Over for Usual Operations Performed on Samples Farms in the Piedmont of Georgia

Operation	Average labor required one time over		
	Man hours	Mule hours	Tractor hours
Seed			
Hand, cyclone seeder	.70	-	-
Cover seed			
Drag harrow, 2-mules	1.02	2.04	-
Drag harrow, tractor	.60	-	.60
Mow hay			
Mower, 2-mules	1.10	2.20	-
Mower, tractor	.85	-	.85
Rake hay			
Dump rake, 2-mules	.82	1.64	-
Side-delivery rake, tractor	.62	-	.62
Haul loose hay			
Wagon, 2-mules	3.63	3.91	-
Bale hay			
Pick-up baler, tractor	.75	-	.51
Haul baled hay			
Hand, truck	2.03	-	.62*
Combine seed			
Combine, tractor	1.72	-	.91**
Haul seed to barn			
Hand, truck	.21	-	.11*

* Hours of truck use.

** Hours of combine and tractor use.

