



CIRCULAR 222
OCTOBER 1975

THE MANAGEMENT OF SERALA SERICEA FOR FORAGE AND SEED

AGRICULTURAL EXPERIMENT STATION/AUBURN UNIVERSITY
R. Dennis Rouse, Director Auburn, Alabama

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FIRST PRINTING 5M, OCTOBER 1975

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MANAGEMENT of SERALA SERICEA for FORAGE and SEED

C. S. HOVELAND, R. F. McCORMICK, JR.,
W. B. ANTHONY and F. T. GLAZE*

SERALA, a fine-stemmed sericea (*Lespedeza cuneata*) variety, can be a highly productive legume for hay production.¹ It is also a satisfactory pasture for beef cows and calves but problems have been encountered with productivity and stand survival under grazing.²

Increasing cost of nitrogen fertilizer has stimulated demand for seed of this sericea variety. Recent research in Alabama found that the short sericea variety, Interstate, should not be cut for hay if maximum seed yield is expected.³ A May hay cutting reduced combine-harvested Interstate seed yields from 645 pounds to 312 pounds per acre over a 2-year period. Since Interstate is grown mainly as a special ground cover plant, its use as a farm crop is mainly for seed production. Refraining from cutting hay may not be a problem with that short-stemmed variety, but farmers who grow Serala sericea may need to cut hay and still harvest some seed.

This publication summarizes results of sericea management experiments at two locations in central Alabama.

EFFECT OF CLIPPING MANAGEMENT ON SERICEA, PRATTVILLE

In a 2-year experiment (1969-1970) at Prattville Experiment Field, Serala sericea planted the previous year in 5 x 20-foot plots replicated four times, was harvested two or four times per year with two stubble heights.

* Professor and Research Associate, Department of Agronomy and Soils; Professor, Department of Animal and Dairy Sciences; and Superintendent, Prattville Experiment Field.

¹ Donnelly, E. D. 1963. Serala Sericea—A New Sericea Variety. Auburn Univ. (Ala.) Agr. Exp. Sta. Leaf. 70.

² Hoveland, C. S., W. B. Anthony, R. R. Harris, E. L. Mayton, and H. E. Burgess. 1969. Serala Sericea, Coastal Bermuda, Goat Tall Fescue. Grazing for Beef Cows and Calves in Alabama's Piedmont. Auburn Univ. (Ala.) Agr. Exp. Sta. Bull. 388.

³ Adamson, H. C. and E. D. Donnelly. 1973. Seed Yields of Interstate Sericea as Affected by Cutting and Irrigation. Auburn Univ. (Ala.) Agr. Exp. Sta. Leaf. 87.

Forage yields were highest (4 to 5 tons per acre) when sericea was cut for hay twice each year, Figure 1. Cutting four times each year reduced the forage yield to half that produced by the two-cut treatment. First year yields with four cuts per year were highest where short stubble was left. However, the reverse was true the following year when plants cut to a 5-inch stubble height were most productive. At the end of the second harvest year, stands exceeded 85 percent when cut four times to a 5-inch stubble. In contrast, sericea cut four times each year to a 1½-inch stubble had stands of only 60 percent.

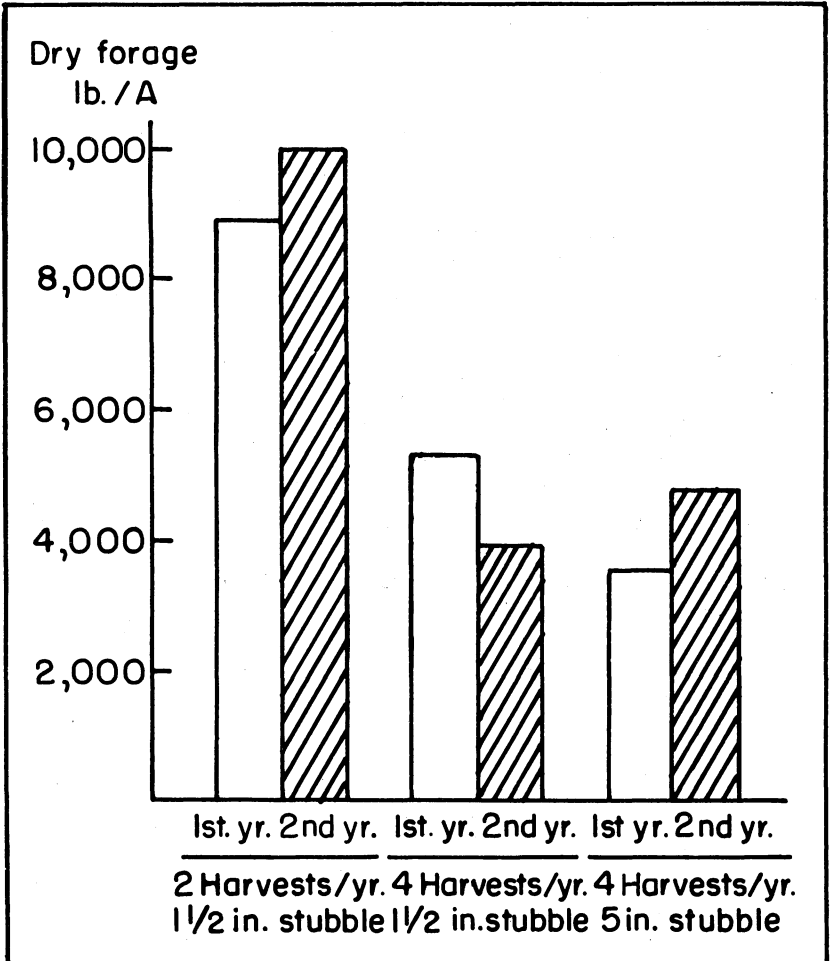


FIG. 1. Forage yields as affected by stubble height and cutting frequency at Prattville Experiment Field.

Food reserves, or lack of them, in the roots probably account for the stand loss. Root carbohydrates were reduced by harvesting four times a year as compared to twice a year, Figure 2. Leaving a 5-inch stubble resulted in more root carbohydrates than where a 1½-inch stubble was left. Both varieties gave a similar response. These results suggest that where sericea is to be grazed, a high stubble should be maintained to permit the plants to accumulate root reserves. It is likely that where sericea is grazed closely for several years, stands will deteriorate.

EFFECT OF CLIPPING MANAGEMENT ON SERICEA, PLANT BREEDING UNIT

In a 3-year experiment (1970-1972) on an established stand of *Serala sericea* at the Plant Breeding Unit, Tallassee, forage was harvested from 5 x 20-foot plots replicated four times at 3, 6, or

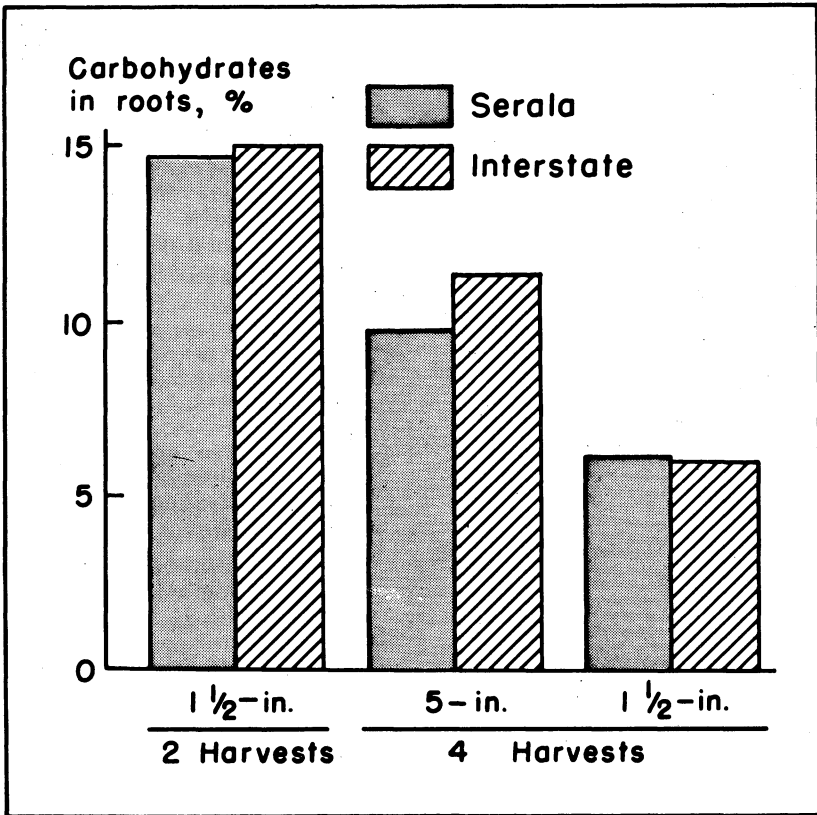


FIG. 2. Carbohydrate storage in sericea roots in August of the second harvest year, Prattville Experiment Field.

9-week intervals with stubble heights of 1½ or 4 inches. Harvesting began in April and was terminated in early June, August, or October to determine the effect on forage yield, stand persistence and forage quality. Seed harvesting was done in mid-October using a sicklebar mower and a small stationary thresher.

Forage Production

Average sericea forage yields over 3 years were reduced about 44 percent by terminating harvesting in June as compared to

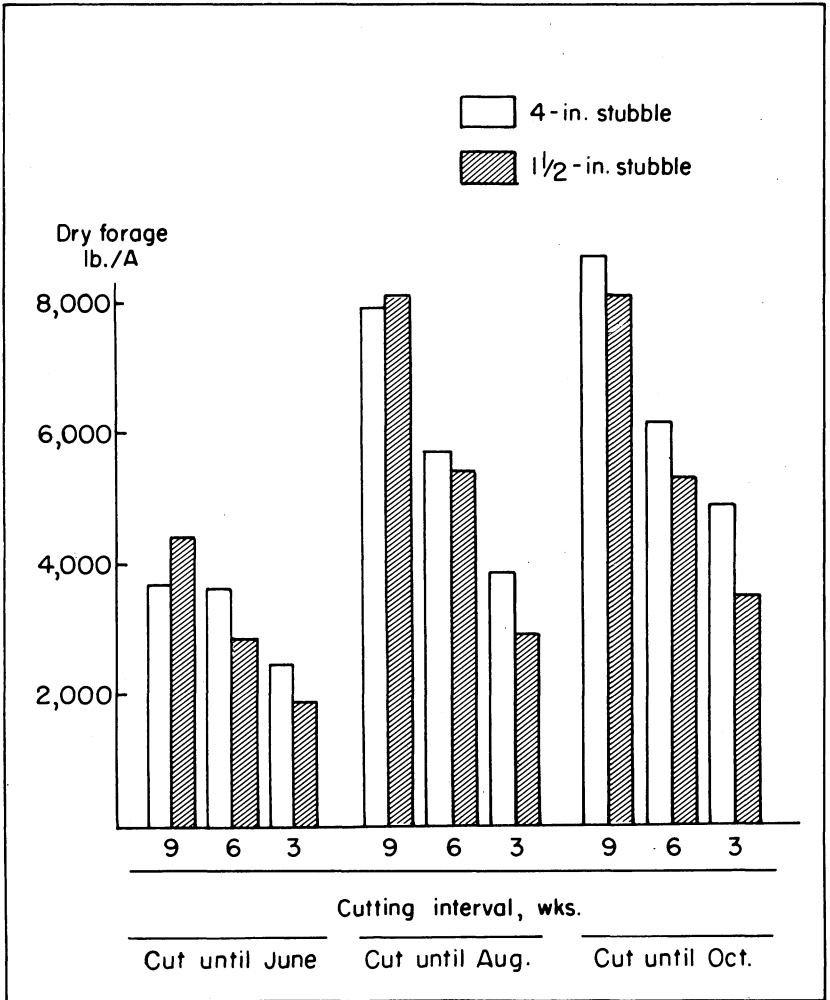


FIG. 3 Three-year average forage yields for sericea at two stubble heights and three cutting intervals.

August, Figure 3. Additional harvesting from August until October increased yields only slightly.

Forage yields were highest (over 4 tons per acre) when sericea was cut three times a year at 9-week intervals, Figure 3. Harvesting two hay cuts, one in early June and one in early August, resulted in hay yields nearly equal to that from three cuts a year. Stubble height had little effect on forage yield when sericea was cut at the hay stage.

When sericea was cut every 3 weeks to simulate grazing, forage yields were one-half to two-thirds those obtained when cut at the hay stage, Figure 3. Sericea cut at 6-week intervals yielded somewhat better than at 3-week intervals but was much below the 9-week interval or hay stage. Leaving a 4-inch stubble on plants cut every 3 or 6 weeks resulted in higher forage yields than a 1½-inch stubble. This indicates that sericea is especially sensitive to close defoliation unless cutting intervals of about 9 weeks are used.

The harmful effects of cutting at 3 or 6-week intervals were more noticeable by the third year, Figure 4. Although a severe late summer and autumn drought the third year reduced forage yields, sericea cut at 9-week intervals until August or October yielded two or three times more than that cut more frequently.

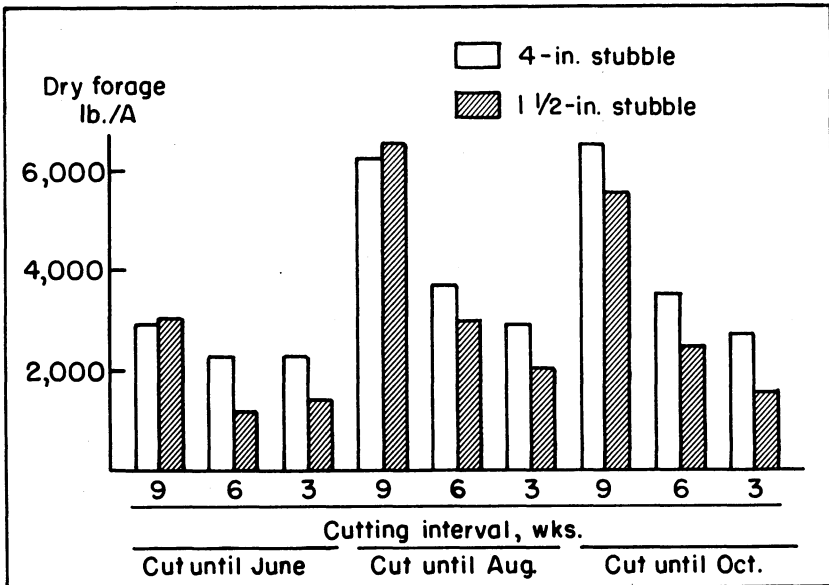


FIG. 4. *Sericea sericea* third-year forage yields as affected by cutting interval and stubble height.



FIG. 5. Regrowth of *Seralea sericea* was more rapid when cut at 4-inch stubble height (left) than at 1½-inch height (right).

Stubble height had no effect on forage production when sericea was cut at 9-week intervals. However, cutting every 3 to 6 weeks at a short stubble height reduced forage yields more the third year than in previous years even when cutting was terminated in June. Cutting every 3 weeks to a 1½-inch stubble from April until August or October resulted in forage yields only one-third that of sericea cut at 9-week intervals. Regrowth after cutting was much more rapid on plants cut at 3-week intervals with a 4-inch stubble height than at 1½ inches, Figure 5. The slower recovery was a result of less growth buds on the short-stubble plants and less root carbohydrates. The slow recovery of short-



FIG. 6. Stands and vigor of *Seralea sericea* after 3 years were injured more when cut at 1½-inch stubble height (left), than at 4-inch height (right).

TABLE 1. SERICEA STANDS (GROUND COVER) DURING JUNE OF THIRD YEAR AS AFFECTED BY STUBBLE HEIGHT AND CUTTING FREQUENCY AT PLANT BREEDING UNIT

Date of final harvest	Stubble height	Harvest frequency	Ground cover
	In.	Wks.	Pct.
June.....	4	9	34
		6	45
		3	42
	1½	9	21
		6	14
		3	19
August.....	4	9	52
		6	61
		3	55
	1½	9	45
		6	34
		3	26
October.....	4	9	42
		6	40
		3	41
	1½	9	19
		6	11
		3	11

stubble plants also allowed more weeds to germinate and grow than with 4-inch stubble plants.

Stand Persistence

Leaving a 4-inch stubble on plants cut every 3 weeks resulted in better stand persistence than leaving a 1½-inch stubble, Table 1. Sericea cut at hay stage (9 weeks) generally maintained good stands although there was some reduction by the third year when a 1½-inch stubble height was used. The loss of vigor and stand of sericea cut at 6-week intervals at a 1½-inch stubble height is illustrated in Figure 6.

Forage Quality

Digestible dry matter (DDM) of Serala sericea forage was constant for each cutting treatment throughout the season, Table

TABLE 2. SERALA SERICEA DIGESTIBLE DRY MATTER (DDM) AS AFFECTED BY MANAGEMENT, 3-YEAR AVERAGE AT PLANT BREEDING UNIT

Stubble height	Harvest frequency	Percent DDM								
		May 12	June 1	June 23	July 14	Aug. 3	Aug. 25	Sept. 15	Oct. 6	Average
4	9	---	46	---	---	43	---	---	49	46
	6	49	---	48	---	49	---	54	---	50
	3	49	51	48	53	51	52	55	45	50
1½	9	---	45	---	---	45	---	---	50	47
	6	49	---	49	---	50	---	52	---	50
	3	50	47	51	55	55	55	55	46	52

2. Stubble height had no effect on DDM; however, more frequently cut sericea had slightly higher DDM than sericea harvested at the hay stage of maturity.

The DDM values reported here are similar to those for hay made from some warm season perennial grasses such as bermuda

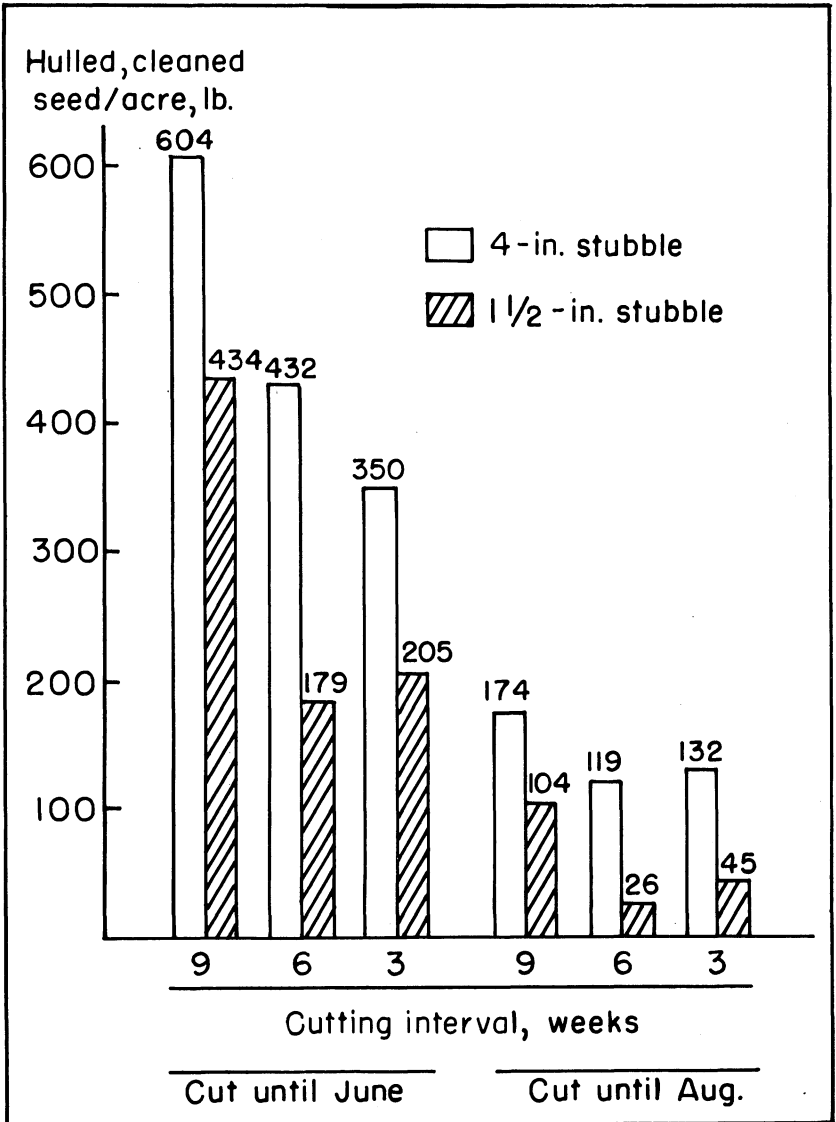


FIG. 7. Three-year average seed yields of *Seralea sericea* cut at two stubble heights and three intervals.

or bahia. Although the DDM of *Serala sericea* is not high, this forage can meet the feed needs of beef herds. Also, because growth interval was not of much importance for forage quality, sericea hay harvest could be delayed as required to coincide with favorable weather for curing hay.

Seed Production

Seed yields were largely determined by cutting management, Figure 7. When forage harvesting continued to August, seed yields were only one-fourth to one-half of that made when cutting ended in June each year. Since only about 70 percent of the seed produced are recovered in combine harvesting, yields generally would be too low to justify harvesting sericea that had been cut for hay or grazed until August.

Previous work has shown that highest sericea seed yields are obtained when no forage is harvested. In this experiment, about 600 pounds seed per acre were obtained by cutting sericea one time per year in early June to a height of 4 inches. More frequent cuttings reduced seed yields. This indicates that grazing sericea during the spring probably would reduce seed yields more than taking a single cutting for hay in May or early June. When forage harvesting was terminated in June, cutting frequently to a short stubble had more effect on seed production than on forage yields.

Cutting forage to 1½-inch stubble height reduced seed yields regardless of cutting frequency. This was probably a result of reduced root carbohydrate storage with the 1½-inch as compared with the 4-inch stubble height.

Results clearly establish that cutting *Serala sericea* for hay in May or June will reduce seed yields. However, 1½ to 2 tons of *Serala* hay can be harvested and still permit a good seed yield if the hay is cut to 4-inch stubble height. Harvesting seed after a May or June hay cut will reduce total annual forage yield by 50 percent. Frequent and close defoliation in spring can be expected to cut seed yields more than making a single hay cutting in May or early June.

SUMMARY AND CONCLUSIONS

Serala sericea was harvested under various management systems at Prattville Experiment Field for 2 years and at the Plant Breeding Unit, Tallassee, for 3 years to determine the effect on forage yield and quality, persistence, and seed yield.

1. Forage yields were highest (4 tons per acre) when sericea

was cut at 9-week intervals until August or October. Cutting at 6 and 3-week intervals reduced forage yields 41 percent and 53 percent respectively.

2. Harvesting sericea at a 1½-inch stubble height reduced forage yields below that of a 4-inch stubble for the 3 or 6-week cutting intervals but had no effect at the 9-week interval.

3. Frequent cutting and a short stubble height reduced root carbohydrate reserves, slowed development of new shoots, and weakened stands of sericea.

4. Digestible dry matter (DDM) of forage was constant for a given cutting treatment throughout the growing season. DDM was slightly lower for forage when cut at 9-week intervals than at 3 or 6-week intervals but was unaffected by stubble height.

5. Maximum seed yields can be expected where no forage is harvested. Seed yields of about 600 pounds per acre were obtained when one hay harvest was removed to leave a 4-inch stubble than when cut more frequently. Cutting to a short stubble early in the season reduced seed yields.

6. To maintain a vigorous productive stand, sericea should probably not be cut for hay more than twice a year. If seed is to be harvested in October, a 4-inch stubble height should be left when making a May or early June hay cutting.

7. Grazing of Serala sericea will require that a high stubble be maintained. Continuous grazing can be expected to weaken sericea stands and reduce yields. Serala sericea requires more careful management when used for grazing than for hay.

8. Since sericea forage DDM is not affected appreciably by management, the major emphasis should be on maintaining stands and a high level of productivity.

