

ESTABLISHING SERICEA LESPEDEZA
at
LOW SEEDING RATE with a HERBICIDE

CIRCULAR 174

FEBRUARY 1970



AGRICULTURAL EXPERIMENT STATION
AUBURN UNIVERSITY

E. V. Smith, *Director*

Auburn, Alabama

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Establishing Sericea Lespedeza at Low Seeding Rate with a Herbicide

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SERIALA, an improved sericea (*Lespedeza cuneata*) variety with good forage quality (2,3) has stimulated new interest in this crop.

Farmers at times experience difficulties in establishing sericea. Even with good stands, generally no forage is obtained the year of establishment. Unfortunately, sericea seedlings are weak and compete poorly with spring and summer weeds. Heavy seeding rates of 30 or more pounds per acre have been recommended to allow sericea to be more competitive with weeds. Additional cost of heavy seeding rates limits planting of new improved sericea varieties.

Several herbicides give acceptable control of grasses and broadleaf weeds in sericea (1). EPTC (Eptam) gives good control but may cause injury to sericea, particularly on sandy loam soil. Vernolate (Vernam) is the most promising herbicide as it gives good weed control and has caused no injury to sericea with rates as high as 9 pounds per acre.

The objective in this study was to determine if satisfactory sericea stands and first year forage yields could be obtained using a low seeding rate with vernolate.

EXPERIMENTAL PROCEDURES

Experimental plots were planted in March, 1968 and 1969 on Cahaba fine sandy loam at the Plant Breeding Unit, Tallassee (central Alabama). Another test was planted in April, 1969 on Decatur clay at the Tennessee Valley Substation, Belle Mina (northern Alabama).

Vernolate was incorporated preplant with a disk harrow adjusted to run 4-6 inches deep. Vernolate was applied at 0, 2, 3,

and 6 pounds per acre. In 1968 the 2 pounds per acre rate was not used. Application was made with a knapsack sprayer using 15-20 gallons of water per acre and a spraying pressure of 30 p.s.i. *Serala sericea* was seeded broadcast at rates of 10, 20, and 30 pounds per acre and cultipacked. Better stands result from broadcast seeding than drill seeding (4). Plots 10 × 20 feet were replicated four times.

Counts of grass and broadleaf weeds and sericea seedlings were made during the spring. Forage was harvested once during the year of establishment on all experiments and twice the second year at the Plant Breeding Unit. One-half of each plot was not harvested the year of establishment to determine the effect of cutting on yield the next season. Samples were collected from each plot at harvest and hand separations made of sericea and weeds.

RESULTS

Year of Establishment

Excellent weed control was obtained with 3 pounds of vernolate per acre at the Plant Breeding Unit in 1968. Stand counts showed virtually no grass or broadleaf weeds on vernolate treated plots, Table 1. Weeds, which were numerous on untreated plots, were primarily pigweed, crabgrass, and goosegrass. Sericea stands were not affected by vernolate. Herbicide application doubled or tripled sericea forage yields and resulted in sericea stands free of grass or broadleaf weeds.

TABLE 1. EFFECT OF HERBICIDE AND SEEDING RATE ON STANDS AND YIELDS OF SERICEA IN ESTABLISHMENT YEAR AT PLANT BREEDING UNIT, 1968

| Vernolate rate | Sericea seeding rate | Stand, May 7 | | | Dry forage yield, Aug. 8 | | |
|----------------|----------------------|----------------------|----------------------|----------------------|--------------------------|-----------|---------|
| | | Weeds | | Sericea | Weeds | | Sericea |
| | | Grass | Broadleaf | | Grass | Broadleaf | |
| Lb./A. | Lb./A. | Plants/ 6 sq. ft. | Plants/ 6 sq. ft. | Plants/ 6 sq. ft. | Lb./A. | Lb./A. | Lb./A. |
| 0 | 10 | 16 | 8 | 34 | 1,690 | 670 | 950 |
| | 20 | 28 | 5 | 54 | 2,040 | 1,180 | 620 |
| | 30 | 5 | 6 | 47 | 900 | 650 | 1,390 |
| 3 | 10 | 0 | 1 | 28 | 0 | 0 | 2,430 |
| | 20 | 0 | 0 | 44 | 0 | 0 | 2,920 |
| | 30 | 0 | 0 | 58 | 0 | 0 | 2,950 |
| 6 | 10 | 0 | 0 | 32 | 0 | 0 | 2,190 |
| | 20 | 0 | 1 | 44 | 0 | 0 | 2,300 |
| | 30 | 0 | 1 | 55 | 0 | 0 | 2,890 |

Sericea seeding rates had only a small effect on weed stands or on yield of weeds and sericea. Increasing the seeding rate from 10 to 20 pounds per acre increased sericea stands but had little effect on yield.

Another experiment, planted in 1969 adjacent to the 1968 test at the Plant Breeding Unit, had an additional treatment with a rate of 2 pounds of vernolate per acre. Results in this test were similar early in the season to those in 1968, Table 2. There was a sharp reduction in stands of grass and broadleaf weeds at all herbicide rates with no harmful effect on sericea. Much higher rainfall during May through July (17.6 inches in 1969 versus 8.4 inches in 1968) encouraged grass growth. Considerable fall panicum was present and this weedy grass was not adequately controlled by vernolate. Nevertheless, vernolate at 3 pounds per acre resulted in sericea yields about the same as 1968. Untreated seedings yielded virtually no sericea forage in 1969. Two pounds of vernolate per acre decreased weed stands in May but did not give satisfactory sericea yields because of weed growth later in the season. Heavy grass growth during the wet summer competed seriously with sericea. With no herbicide, grass yields of 3 tons per acre were obtained compared with about 1½ tons per acre with 3 pounds of vernolate per acre. There was no advantage in increasing vernolate rates from 3 to 6 pounds per acre.

Seeding rates, as in the previous year, had no effect on grass or broadleaf weed stands, Table 2. Increasing the seeding rate

TABLE 2. EFFECT OF HERBICIDE AND SEEDING RATE ON STANDS AND YIELDS OF SERICEA IN ESTABLISHMENT YEAR AT PLANT BREEDING UNIT, 1969

| Vernolate rate | Sericea seeding rate | Stand, May 21 | | | Dry forage yield, July 24 | | |
|----------------|----------------------|----------------------|----------------------|----------------------|---------------------------|-----------|---------|
| | | Weeds | | Sericea | Weeds | | Sericea |
| | | Grass | Broadleaf | | Grass | Broadleaf | |
| Lb./A. | Lb./A. | Plants/ 6 sq. ft. | Plants/ 6 sq. ft. | Plants/ 6 sq. ft. | Lb./A. | Lb./A. | Lb./A. |
| 0 | 10 | 38 | 7 | 27 | 5,340 | 20 | 300 |
| 0 | 20 | 38 | 6 | 42 | 7,510 | 0 | 60 |
| 0 | 30 | 33 | 6 | 75 | 6,840 | 410 | 20 |
| 2 | 10 | 12 | 1 | 52 | 4,610 | 170 | 880 |
| 2 | 20 | 11 | 1 | 54 | 4,840 | 100 | 550 |
| 2 | 30 | 10 | 3 | 87 | 5,690 | 60 | 1,010 |
| 3 | 10 | 16 | 1 | 45 | 2,420 | 0 | 3,920 |
| 3 | 20 | 7 | 0 | 84 | 3,750 | 100 | 2,070 |
| 3 | 30 | 18 | 2 | 62 | 2,840 | 20 | 2,550 |
| 6 | 10 | 12 | 2 | 51 | 720 | 60 | 4,860 |
| 6 | 20 | 14 | 2 | 61 | 2,810 | 490 | 3,000 |
| 6 | 30 | 12 | 1 | 59 | 2,060 | 290 | 2,710 |

from 20 to 30 pounds per acre increased sericea stands on non-vernolate treated plots. However, differences in sericea stands in May because of increased seeding rate had no effect on the yield of forage harvested in late July.

Results at the Tennessee Valley Substation were similar to the 1968 test at the Plant Breeding Unit, Table 3. May through July rainfall totaled only 11 inches with most of this (6.4 inches) falling in May. Weed species at this location were mainly crabgrass, goosegrass, prickly sida, smallflower morningglory, tall morningglory, and red root pigweed. Stands of grass and most broadleaf weeds were sharply reduced by all rates of vernolate. Slightly higher broadleaf weed counts are attributed primarily to prickly sida and tall morningglory, species not controlled by vernolate. Sericea stands were unaffected by the herbicide. Although production was severely reduced by drought, sericea treated at all vernolate rates yielded 3 to 4 times more than untreated plots.

Seeding rates on this clay soil had no effect on grass stands but 30 pounds per acre seed reduced broadleaf weed stands and broadleaf weed yields, Table 3. Sericea stands increased with seeding rate but increased stands had no effect on forage yield. As shown in the photo, the sericea stand appeared sparse from 10 pounds seed and 3 pounds vernolate per acre but good forage growth had been made one month later.

TABLE 3. EFFECT OF HERBICIDE AND SERICEA SEEDING RATE ON STANDS AND YIELDS OF SERICEA AT TENNESSEE VALLEY SUBSTATION, 1969

| Vernolate rate | Sericea seeding rate | Stand, June 12 | | | Dry forage yield, Aug. 25 | | |
|----------------|----------------------|----------------------|----------------------|----------------------|---------------------------|-----------|---------|
| | | Weeds | | Sericea | Weeds | | Sericea |
| | | Grass | Broadleaf | | Grass | Broadleaf | |
| Lb./A. | Lb./A. | Plants/ 6 sq. ft. | Plants/ 6 sq. ft. | Plants/ 6 sq. ft. | Lb./A. | Lb./A. | Lb./A. |
| 0 | 10 | 24 | 41 | 54 | 1,400 | 900 | 140 |
| 0 | 20 | 29 | 39 | 92 | 870 | 870 | 340 |
| 0 | 30 | 10 | 6 | 174 | 1,160 | 670 | 540 |
| 2 | 10 | 4 | 7 | 52 | 120 | 1,180 | 1,030 |
| 2 | 20 | 7 | 3 | 124 | 580 | 450 | 1,260 |
| 2 | 30 | 4 | 6 | 118 | 490 | 640 | 1,080 |
| 3 | 10 | 1 | 2 | 69 | 250 | 790 | 1,590 |
| 3 | 20 | 2 | 4 | 127 | 180 | 470 | 1,630 |
| 3 | 30 | 4 | 1 | 151 | 220 | 460 | 1,310 |
| 6 | 10 | 2 | 0 | 48 | 230 | 400 | 1,160 |
| 6 | 20 | 2 | 2 | 131 | 200 | 500 | 1,390 |
| 6 | 30 | 1 | 2 | 154 | 100 | 210 | 1,700 |



Sericea sericea seeded at 10 pounds per acre, Tennessee Valley Substation, left above, no vernolate and below, 3 pounds vernolate per acre, June 23; right above, no vernolate and below, 3 pounds vernolate per acre, July 24.

Second Year Stand

Sericea stands at the Plant Breeding Unit were good the second year, regardless of seeding or herbicide rates the previous year. *Sericea* forage yields were increased the second year by herbicide application in 1968, Table 4. Total yields the second year were about 50 per cent higher on *sericea* seeded at 10 pounds per acre and receiving 3 pounds vernolate per acre as compared with no herbicide at the 10-pound seeding rate. Vernolate-treated plots yielded more forage than non-treated plots at both the May 22 and July 24 harvest dates. Although stands were good where vernolate had not been applied the previous year, *sericea* plants were small and less able to compete with weeds, accounting for heavy weed growth at both harvests.

TABLE 4. EFFECT OF HERBICIDE, SEEDING RATE, AND PREVIOUS CUTTING ON WEED-FREE FORAGE YIELD OF SECOND YEAR SERICEA AT PLANT BREEDING UNIT, 1969

| Vernolate rate | Sericea seeding rate | Dry forage yield in 1969 | | | | | |
|----------------|----------------------|--------------------------|---------|--------|-----------------------|---------|-------|
| | | Harvested in 1968 | | | Not harvested in 1968 | | |
| | | May 22 | July 24 | Total | May 22 | July 24 | Total |
| Lb./A. | Lb./A. | Lb./A. | Lb./A. | Lb./A. | Lb./A. | Lb./A. | |
| 0 | 10 | 1,410 | 3,140 | 4,550 | 1,860 | 3,990 | 5,850 |
| 0 | 20 | 1,870 | 3,490 | 5,360 | 2,040 | 3,670 | 5,710 |
| 0 | 30 | 1,880 | 4,010 | 5,880 | 3,320 | 4,530 | 7,850 |
| 3 | 10 | 2,910 | 3,960 | 6,870 | 3,140 | 4,070 | 7,210 |
| 3 | 20 | 3,280 | 4,220 | 7,600 | 4,210 | 4,820 | 9,030 |
| 3 | 30 | 2,480 | 4,180 | 6,660 | 3,820 | 4,400 | 8,220 |
| 6 | 10 | 3,210 | 4,470 | 7,680 | 4,490 | 4,820 | 9,310 |
| 6 | 20 | 3,400 | 4,470 | 7,870 | 3,130 | 4,530 | 7,660 |
| 6 | 30 | 3,570 | 4,790 | 8,360 | 4,340 | 4,470 | 8,810 |

Sericea seeding rates had little effect on forage yields the second year. This indicates that 10 pounds per acre was a sufficiently high seeding rate and that planting additional seed did not improve competition with weeds.

Cutting sericea in the year of establishment caused an average 10 per cent reduction in forage yield the following year, Table 4. The yield reduction was greatest at the first harvest. This small yield reduction was more than compensated by forage harvested the establishment year. Sericea seeded at 10 pounds per acre and treated with 3 pounds vernolate per acre yielded a 2-year total of 9,300 pounds per acre when cut the first year and 7,220 pounds per acre when not cut the first year.

SUMMARY AND CONCLUSIONS

Serala sericea was planted in field experiments to evaluate seeding rates and vernolate herbicide on establishment. Grasses and most broadleaf weed stands were sharply reduced and sericea unaffected by vernolate.

Sericea seeding rate had little influence on establishment, weed competition, and forage production. Reducing the sericea seeding rate from the presently recommended 30 pounds seed per acre to 10 pounds per acre and applying 3 pounds vernolate pre-plant was the most economical and productive method of establishment.

Sericea yields the year of establishment were increased 2 to 10 times when vernolate was applied. The beneficial effect of the

vernolate continued the second year because sericea plants were larger and more vigorous, and better able to compete with weeds.

It has been customary to plant sericea at high seeding rates and expect no return from it until the following year. Application of vernolate with a low seeding rate (with ample rainfall) permits a cutting of hay in early August or grazing during the year of establishment with only a small reduction in yield the following year.

ACKNOWLEDGMENT

The assistance of J. K. Boseck and W. B. Webster, Tennessee Valley Substation; J. W. Langford, Plant Breeding Unit, Tallassee; and E. L. Carden and R. F. McCormick, Department of Agronomy and Soils, is gratefully acknowledged.

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APPENDIX

APPENDIX TABLE 1. CHEMICAL, COMMON AND TRADE NAME OF
HERBICIDES MENTIONED IN THIS PUBLICATION

| Common name | Chemical name | Trade name |
|-----------------|--------------------------------|---------------------|
| EPTC | S-ethyl dipropylthiocarbamate | Eptam ¹ |
| Vernolate | S-propyl dipropylthiocarbamate | Vernam ¹ |

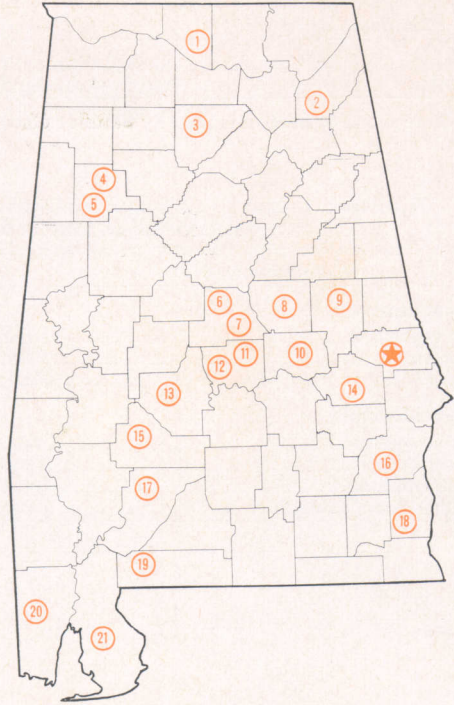
¹ Trade name of herbicide sold by Stauffer Chemical Company.

APPENDIX TABLE 2. COMMON AND SCIENTIFIC NAMES OF WEEDS
MENTIONED IN THIS PUBLICATION

| Common name | Scientific name |
|--------------------------------|---|
| Annual grasses | |
| large crabgrass | <i>Digitaria sanguinalis</i> (L.) Scop. |
| goosegrass | <i>Eleusine indica</i> (L.) Gaertn. |
| fall panicum | <i>Panicum dichotomiflorum</i> Michx. |
| Broadleaf weeds | |
| red root pigweed | <i>Amaranthus retroflexus</i> L. |
| prickly sida | <i>Sida spinosa</i> L. |
| tall morningglory | <i>Ipomoea purpurea</i> L. Roth |
| smallflower morningglory | <i>Jacquemontia tamnifolia</i> L. Griseb. |

AGRICULTURAL EXPERIMENT STATION SYSTEM OF ALABAMA'S LAND-GRANT UNIVERSITY

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Research Unit Identification

★ Main Agricultural Experiment Station, Auburn.

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