

# ARROWLEAF CLOVER

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**A**RROWLEAF CLOVER (*Trifolium vesiculosum* Savi) is a winter annual legume introduced into the United States from Italy in 1956. It was planted in the introduction garden at Auburn University Agricultural Experiment Station in the fall of 1959. For the last 2 years this clover has been tested in yield trials at several locations in Alabama. Several commercial plantings have been made by farmers and a limited quantity of seed is being produced.

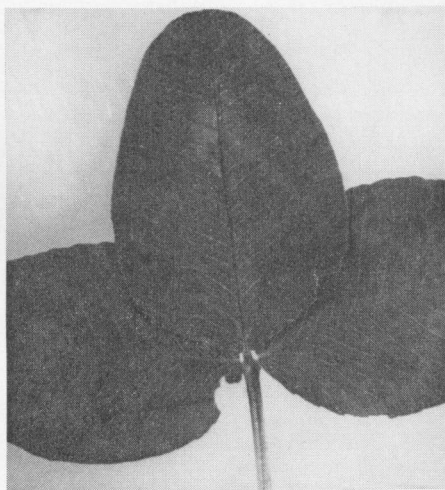
This publication summarizes the research information available on arrowleaf clover in Alabama.

## DESCRIPTION

Arrowleaf clover makes its early growth from a leafy rosette, later producing branching stems that curve upward for 24 to 40 inches. The non-hollow, purple stems become fibrous and hard near maturity.

Leaf petioles are 3 to 8 inches long, at the base of which are long white stipules narrowed to a point. The leaves are large, each of the three leaflets being 1½ to 3 inches long and 1 to 1¼ inches wide. Each arrow-shaped, non-hairy leaflet has pronounced veins and develops a white V-shaped mark as it matures.

The flower heads are large, often exceeding 2 inches in length and 1¼ inches in diameter. From 150 to 170 individual florets make up the head. Florets begin maturing at the base of the head, being white at first and later turning purple. This gives the head a purple and white striped appearance. Each of the florets produces 2 to 3 seeds. The rough brown seed are about twice the size of those produced by Ladino clover. There are



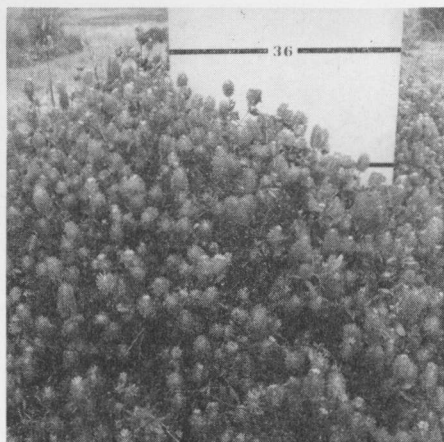
Typical leaf of arrowleaf clover is shown here. The arrow-shaped leaflets have pronounced veins and a white V-shaped mark.

AGRICULTURAL EXPERIMENT STATION

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Arrowleaf clover in bloom shows the characteristic large flower heads that often exceed 2 inches long and 1¼ inches in diameter.

about 400,000 seed per pound. A seeding rate of 5 to 10 pounds per acre should be sufficient.

#### RESULTS of EXPERIMENTS

Three strains of arrowleaf clover have been introduced into the United States: early (P.I. 234310), medium (P.I. 233816), and late maturing (P.I. 233782). Of these, the early and medium strains showed the most promise and were tested in yield trials.

Arrowleaf P.I. 234310 begins blooming in early May and is ready for seed harvest by early June. The medium maturing strain, arrowleaf P.I. 233816, begins blooming in late May or early June and seed can be harvested in July or August. The introduction now in commercial production in Alabama is P.I. 233816.

Arrowleaf clover has been tested since 1960 at seven locations in Alabama by Auburn University Agricultural Experiment Station. This clover has been cold hardy, even when temperatures dropped below 10° F. Forage yield comparisons of arrowleaf with crimson and ball clovers are shown in the table.

Total forage yields of arrowleaf clover have generally equalled those of crimson. In the test at the Gulf Coast Substation, Fairhope, forage yield of arrowleaf was nearly twice as much as crimson or ball clovers. P.I. 233816, the introduction now in commercial production, had better seedling vigor and made more winter production than P.I. 234310. However, total production for the two was similar.

Winter production of arrowleaf has been lower than that of crimson clover. If moisture conditions are favorable, arrowleaf will continue making good growth about 2 months later than crimson and 1 month after ball clover ma-

TOTAL DRY FORAGE YIELDS PER ACRE AND WINTER PRODUCTION OF ARROWLEAF, CRIMSON, AND BALL CLOVERS

Location <sup>1</sup>	Year	Per acre yield of dry forage			
		Arrowleaf 233816	Arrowleaf 234310	Crimson	Ball
		<i>Lb.</i>	<i>Lb.</i>	<i>Lb.</i>	<i>Lb.</i>
Alexandria Experiment Field	1962 Winter	1907	1551	2602	1348
	Total	<b>3726</b>	<b>3320</b>	<b>4697</b>	<b>4180</b>
Tuskegee Experiment Field	1961 Winter	---	415	800	960
	Total	---	<b>2459</b>	<b>2754</b>	<b>5186</b>
Piedmont Substation	1961 Winter	---	1034	870	1141
	Total	---	<b>2334</b>	<b>2402</b>	<b>3611</b>
Plant Breeding Unit	1961 Winter	617	390	1781	1202
	Total	<b>3065</b>	<b>1933</b>	<b>2615</b>	<b>3764</b>
Gulf Coast Substation	1962 Winter	1203	770	1261	694
	Total	<b>6095</b>	<b>5826</b>	<b>3460</b>	<b>3015</b>

<sup>1</sup> All tests were planted on prepared seedbeds except at the Piedmont Substation where planting was made on Coastal Bermudagrass sod.

tures. Since arrowleaf clover makes most of its growth in late spring, it may suffer severely during hot, dry weather in May. Thus, production from year to year will probably vary more for arrowleaf than for crimson clover.

Poor inoculation has been a serious problem with arrowleaf clover on some soils. This delays winter production and decreases the total yield of forage. Inoculating seed and planting under apparently favorable conditions have not always resulted in good inoculation and early growth. For example, at the Plant Breeding Unit, Tallahassee, the planting made in September 1960 did not become inoculated until February 1961. Plantings made the following fall never became inoculated and consequently produced nothing.

Arrowleaf clover is a good seed producer and has a high percentage of hard seed. The bladder pods in the large heads hold seed well, reducing losses from shattering. Its reseeded ability has been excellent on a crabgrass area at Auburn and at the Tuskegee Experiment Field. However, poor reseeded was obtained with arrowleaf clover on Coastal Bermudagrass sod at the Piedmont Substa-

tion, Camp Hill, where ball clover reseeded well.

Seed of arrowleaf clover do not germinate well at high temperatures. Germination tests with scarified seed at alternating temperatures of 70° F for 16 hours and 100° F for 8 hours resulted in germination of only 16 per cent as compared with 68 per cent for crimson clover. Field observations also suggest that arrowleaf does not germinate and produce seedlings as early in the fall as crimson clover. At low temperature, however, germination of arrowleaf is considerably more rapid than crimson clover.

#### **SUMMARY**

Arrowleaf clover is a new winter annual introduction from Italy that may have a place for late spring forage production in Alabama. Yields have varied from fair to excellent, depending on whether plants become inoculated. Late spring droughts may also reduce yields in certain years. Poor inoculation has generally occurred on sandy soils. No data are available concerning animal performance on arrowleaf clover; consequently, its nutritive value has not yet been determined.

