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SOUTHERN BUR CLOVER

(MEDICAGO MACULATA)

BY

E. F. CAUTHEN

Associate Agriculturist and Recorder

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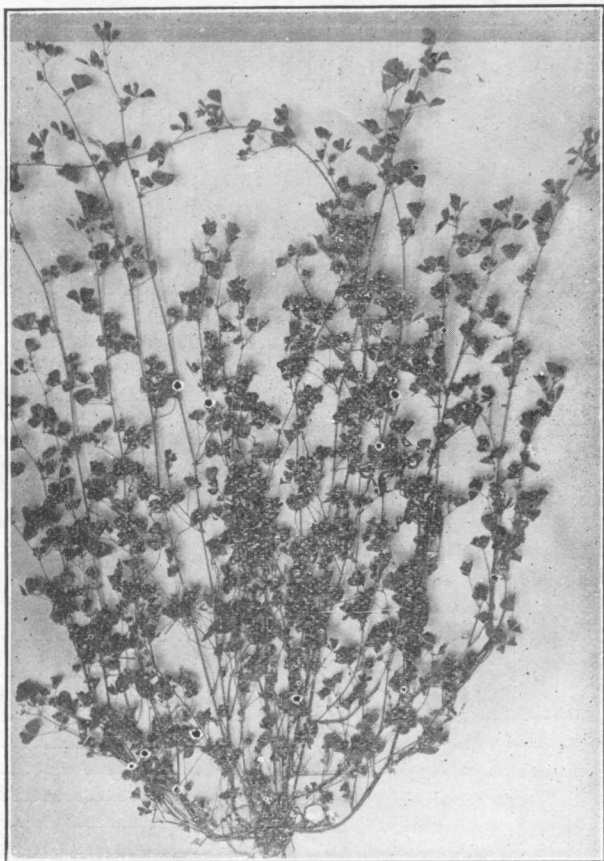


Fig. 1. Plant of southern bur clover showing its long, slender branches.

SOUTHERN BUR CLOVER

BY

E. F. CAUTHEN.

INTRODUCTION.

Many Southern farmers have long felt the need of winter crops for pasture purposes and soil improvement. As the ability of legumes to secure nitrogen from the air becomes more generally understood, the greater is the inquiry for a winter legume that will fill these important needs. Southern bur clover—or winter bur clover, as it is sometimes called, meets these requirements remarkably well. It is easy to grow, is adapted to many kinds of soil and to begin its growth in a small way does not require much expense.

The bur clovers in their wild state are not conspicuous plants, which fact probably accounts for the late discovery of their value as pasture plants and soil improvers.

DIFFERENT SPECIES OF BUR CLOVER.

Bur clover belongs to the medicago family. It is not closely related to the true clovers but is closely related to alfalfa and mel-

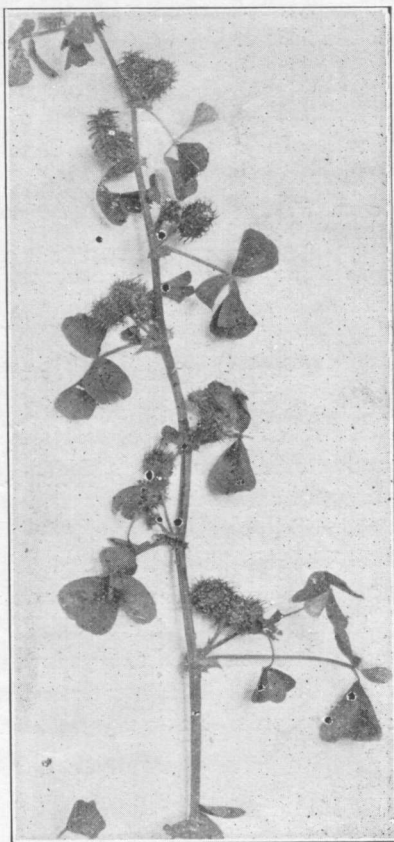


Fig. 2. Branch of southern bur clover showing clusters of burrs.

ilotus. The two species most common are California bur (*medicago denticulata*); and *medicago maculata* commonly known as southern bur, winter bur, spotted medic, or spotted leaf bur. Spotted leaf bur is an appropriate descriptive name and refers to the dark crimson or black spot in the center of the leaf. The flowers are small and yellow and form clusters about the stem; the seed are incased in round spiny burs about the size of large cow-peas.

Southern bur clover, a native of southern Europe and western Asia, is a low spreading annual that readily reseeds itself when left alone. It spreads slowly over old fields and pastures, is easily destroyed in cultivated crops and will not prove a troublesome weed to the farmer.

WHERE IT GROWS.

Southern bur clover grows in all the Gulf and South Atlantic States. In fact, it seems to be adapted to any territory in which cotton can be successfully grown. It will stand a considerable freeze if the seed are sown sufficiently early that the plants may become well rooted before cold weather. The tops of the tender plants may be killed by a freeze, but as soon as warm weather returns, they renew their growth and look as if they had not been damaged.

Southern bur clover will grow on almost any kind of soil—from a sandy type to the sticky Houston clay. It may even be found mixed with weeds and grasses on hard, trodden pastures, roadsides, hillsides and abandoned fields. While it will grow on very poor and even slightly acid soils, it makes its best growth on rich, well limed sandy loam.

The soil should be well drained, for poorly drained lands are often sour and cold and not favorable to the formation of nitrogen-gathering bacteria. On this kind of soil, the clover is often scattering and small and of a yellow, sickly color; but as the soil becomes better drained, sweeter and more completely inoculated, the clover becomes thicker and makes a heavier growth.

INOCULATION.

Most lands are not naturally supplied with the bacteria which form the tubercles on the roots of southern bur clover and therefore, artificial inoculation is absolutely necessary to get a satisfactory

growth. However, on lands where California bur clover has been grown, or melilotus or alfalfa, artificial inoculation is not necessary.

A very satisfactory way to secure this necessary inoculation is to sow the seed in burs. These are harvested by sweeping them up with a stiff broom, which brings together the dirt and litter, which contain the bacteria peculiar to bur clover. When the seed and litter are sown, they carry inoculation into the new soil. Hulled or re-cleaned seed do not carry the bacteria in a satisfactory quantity.

Soil from fields of bur clover, alfalfa or melilotus scattered broadcast at the rate of four or five hundred pounds per acre at the time of seeding is a very satisfactory way of introducing the bacteria, provided the cost of labor to handle and transport this soil is not too great. If this soil can be obtained close at hand and at small expense, it will doubtless pay to put it with the burs, thereby increasing the chances for better inoculation and of improved crops the first year. If the soil has to be transported a long distance and is expensive to handle, the amount per acre may be reduced to two or three hundred pounds.

When soil is used for inoculating purposes, it should be mixed with the seed, and sown when the sun is not shining, as sunshine may kill the bacteria. It has also been found that a good application of well rotted stable manure assists in the development of bacteria and of the first year's growth of clover; southern bur clover requires two or three years for the soil to become sufficiently inoculated to assure a maximum stand and growth.

USES OF SOUTHERN BUR CLOVER.

The uses of southern bur clover are many. It makes an excellent pasture for all kinds of live stock. For forage purposes, it yields some hay, though the tendency of it to fall down when planted alone makes its mowing difficult. By planting it in combination with grain, it is forced to grow more upright and mowing becomes an easy operation.

Probably the greatest use of southern bur clover is that of soil improvement. In winter when the cotton and corn fields are usually bare, a green cover crop of clover would lessen the loss of fertility by washing and leaching; and at the same time, it would add to the soil a large quantity of atmospheric nitrogen.

SOUTHERN BUR CLOVER FOR GRAZING.

Southern bur clover forms an excellent pasture in early spring and late winter for sheep, cattle, hogs and horses. At first, the animals may not like the taste of the clover, but if they are put on it, while it is tender and other green feed is scarce, a relish for it may soon be acquired.

Enough animals should be kept on a clover pasture to keep it eaten down closely. Close grazing will not destroy it but will keep it tender. Even sheep which are the closest grazers of our ordinary domestic animals do not eat it so closely that it will not reseed itself.

The seed germinate after the fall rains begin and, if the season is warm, light grazing will be furnished before the hard part of winter. During the warm spells of the winter and early spring, the clover grows rapidly and often furnishes good pasturage. In this latitude it offers its maximum grazing in the middle of spring. As the grass comes up under the clover, the stock quit the clover and take to the tender grass.

The amount of pasturage furnished per acre by southern bur clover during its growing season will compare favorably with our best native grasses.

Southern bur clover, so far as the writer knows, has never caused cattle to bloat, though it belongs to the class of plants that cause this trouble. Before they are accustomed to grazing the clover, it might be well not to put them on it when they are very hungry or when the clover is wet with dew or rain.

BUR CLOVER WITH BERMUDA GRASS FOR PERMANENT PASTURE.

Southern bur clover grows well on Bermuda sod. Late in the spring the grass becomes very tender, because it is shaded and fertilized by the clover. As the clover dies down, the Bermuda grass grows rapidly. It is believed that its fertilizing effect upon the grass is equivalent to a top dressing of barnyard manure. Another noticeable benefit of bur clover to the sod is the shading and smothering effect on early weeds that infest pastures. (Note Fig. 3 on opposite page.)

SEEDING SOUTHERN BUR CLOVER ON SOD.

There are two common methods of seeding southern bur clover on Bermuda sod. First, the burs are scattered broadcast over the sod in August or September and the fall rains wash them into the low places and pockets where the seed germinate and grow; however, this method of seeding does not secure a uniform stand.

The second method is to open parallel furrows about four or five feet apart with a small scooter plow and drop or scatter the burs in these, at the rate of one to two bushels per acre, depending upon the thickness of stand desired the first year. The seed is covered by dragging a brush or drag harrow across the open furrows.

This thin seeding will not furnish much grazing the first year, but it will give enough plants to grow an abundant seed for the second crop, and future seeding will take care of itself.

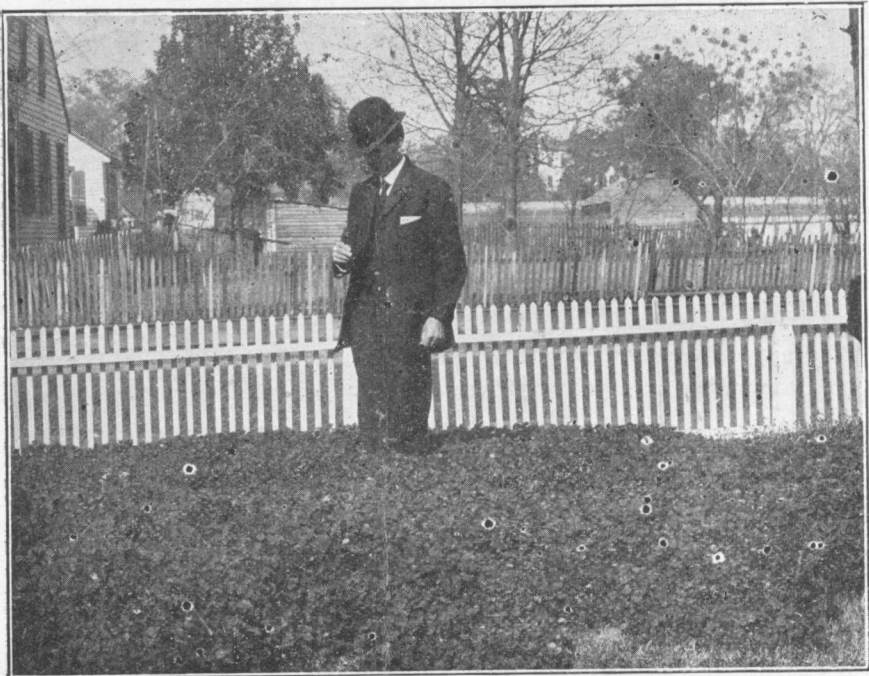


Fig. 3. Southern bur clover growing on Bermuda sod in very early spring, before the leaves appear on the trees.

SOUTHERN BUR CLOVER AS A HAY CROP.

The spreading habit of southern bur clover and its tendency to fall down will prevent its common use as a hay crop. However, hay can be made of it, if it is planted very thickly on highly fertilized soil. But the best way to make a hay crop of it is to sow it with fall grain.

Southern bur clover and oats or wheat may be planted together in September or October. Three to six bushels of burs and two and one-half bushels of red rust proof oats or one and one-half bushels of some early wheat should be seeded per acre. By crowding the grain and clover together, the clover is forced to grow upright and a larger amount is harvested.

CUTTING AND CURING SOUTHERN BUR CLOVER HAY.

The time for mowing southern bur clover for hay is when its blooms are appearing abundantly. If the cutting is not done at the proper time, the plants fall down and that portion which is next to the ground sheds its leaves, becomes woody and dark, and the market value of the hay is lowered.

If grain and clover are combined for hay, they should be mowed when the grain is in the milk stage. If allowed to stand much longer, the straw of the grain becomes woody and is not so palatable.

Curing of clover alone is not difficult. After the dew is off the mower may be started and run until noon. Before the dew appears in the evening, the morning cutting should be raked from the swath to a windrow where it may lie for one or two days. Then, if racks—like those in Fig. 4—are available, the hay may be put on them and cured ready for baling without further handling. If the clover is allowed to remain in the swath a long time, it becomes dry and brittle and loses many leaves, which form a valuable part of the hay.

A mixture of clover and grain cures rapidly in the swath because the clover is held apart by the straw which permits the air to circulate freely through the hay. After curing two or three days in the swath, it may be raked and thrown on racks to remain until it is completely cured.



Fig. 4. On the left is a frame for curing hay; on the right is a similar frame covered with hay and capped with a burlap bag.

YIELD OF HAY.

Bur clover alone (average of two experiments)	3493 lbs. per acre
Bur and crimson clover and oats	5520 " " "

The large yield of hay recorded in the above table is secured from land that produces, in ordinary seasons, a bale of cotton per acre. The soil is well inoculated and limed, and the stand of clover plants is nearly perfect.

CHEMICAL ANALYSIS OF SOUTHERN BUR CLOVER HAY.

Water	7.59 per cent.
Crude Fat	4.22 " "
Crude Protein	19.50 " "
Crude Fiber	25.70 " "
Ash	9.89 " "

Analysis by Prof. C. L. Hare.

From the above analysis it is seen that southern bur clover hay ranks very high in protein and fat. When it is cut at the right stage for hay and perfectly cured, its value as a feed will compare well with the best cowpea vine or clover hay.

SOUTHERN BUR CLOVER AS A SOIL IMPROVER.

Probably the greatest value of this clover to the Southern farmer is its use as a winter cover crop and a soil improver. During the winter it makes considerable growth and utilizes the soluble plant foods that might be washed or leached from the soil. Masses of fine roots penetrate and hold the soil together during the heavy winter and spring rains and prevents surface washing. In the spring the roots rapidly decay and add humus to the soil.

Southern bur clover like other legumes has the ability to gather nitrogen from the air and put it in the soil by means of nitrogen gathering bacteria. The tubercles or nodules on the clover roots may be compared to fertilizer factories which gather from the free and unlimited supply of atmospheric nitrogen and manufacture it into plant food. In order that the bacteria in the nodules may get an unlimited supply of nitrogen, the air must circulate freely through the soil; this necessitates good drainage and thorough cultivation.

Nitrogen is the most expensive element of plant food in commercial fertilizers. By the use of bur clover and other legumes the farmer's bill for commercial fertilizer may be greatly reduced.

A crop of bur clover producing 3490 pounds of hay leaves approximately 1375 pounds in stubble and roots, if crimson clover may be used as a basis of calculation. From chemical analysis of bur clover roots and stubble made at this station, it was found that the roots and stubble from a crop of 3500 of hay put in the soil about 20 pounds of nitrogen. This amount of nitrogen is equal in round numbers to 133 pounds of nitrate of soda or 266 pounds of cotton seed meal.

The entire growth of clover may be plowed under in the spring as a fertilizer; or it may be cut for hay or grazed, and the remaining part of the plant turded under for soil improvement.



Fig. 5. Plats of cotton and corn growing after bur clover. Photographed Aug. 8.

PLOWING UNDER THE CLOVER.

Southern bur clover makes its most rapid growth in April and May. There is a tendency among farmers to plow it under too late in the spring; and as a result of the late plowing, the land is often poorly prepared, crops are not planted at the proper time and their cultivation is made difficult. A period of two to three weeks is needed for the soil to settle down; then a second plowing and harrowing should be given the land before planting a crop of cotton or corn.

SEEDING FOR A CATCH CROP.

The practice of sowing southern bur clover in cotton and corn fields as a catch crop offers many advantages over the leaving of fields bare through the winter. The soil may be prevented from washing and leaching, and at the same time atmospheric

nitrogen and other organic matter be added. The fields may furnish late winter and early spring pastures in addition to the soil improvement.

The seed in burs are sown at the rate of three to six bushels per acre, depending upon the amount of seed available and their expense. When they are grown on the farm, the burs and trash may be raked up and scattered over the land liberally.

The best time for seeding southern bur clover in the burs is August and September. The rains wash the burs down in the middle of the rows and cover them with soil. Those falling in depressions and on damp soil will soon germinate, while those falling on high places may not germinate till the late fall rains. Those germinating late will not make much growth before spring.

A better practice is to sow the seed in the cotton and the corn middles and cover them with a heel scrape or spring tooth cultivator. By using short single trees and wrapping the traces, little damage is done to the cotton or corn. If the cotton is open, the seeding may follow the pickers without much loss.

GROWING AND HARVESTING SEED.

The greatest problem of the farmer to solve in introducing southern bur clover on his farm is the matter of securing seed cheaply. At present very few farms are growing seed for the market. Scarcely enough seed is obtainable at the present time to supply a limited number of farms.

The scarcity of southern bur clover seed is due largely to the difficulty in harvesting them. At present no machine has been made that will do satisfactory work. The invention of an inexpensive huller would greatly encourage the growth of more seed. Until these problems have been solved, the method of seeding in burs, will be followed which is desirable where inoculation of the soil must be done at the time of seeding.

Most of the seed for sale are harvested by sweeping or scraping them together with stiff brooms after the plants have died down. This method gathers not only the seed but stems and other litter and soil and makes a bulky mass to ship. If the seed are to be used on the farm where they are grown, the matter of bulk is of little consequence. They may be raked up, hauled and scattered upon the land to be seeded. To avoid interference with

weeds and grass, the seed should be gathered as soon as the plants die down.

SEED PATCH.

Probably the best way for the average farmer to supply himself with seed is to grow a small seed-patch. A small area of fertile soil may be set aside for this purpose. It should be well prepared, highly fertilized with stable manure, well limed and seeded at the rate of eight to ten bushels of burs per acre. In case of a poor growth the first year, the plants should not be destroyed but allowed to mature their seed. In the early autumn another dressing of stable manure should be applied, the seed



Fig. 6. Seed patch of southern bur clover. Photographed April 18.

evenly scattered over the ground and covered smoothly with a acme or spring-tooth harrow. The second year the yield of seed will be greatly increased. Growers have reported yields from seventy-five to one hundred and fifty bushels of seed in burs per acre. A bushel of seed in burs weighs ten pounds.

RESEEDING OF SOUTHERN BUR CLOVER.

Southern bur clover produces large quantities of seed. The plants die down in the spring and leave the seed on the ground where they remain through the summer. When the fall rains

come, the seed in the low places germinate and begin their growth without any further preparation of soil. After the seed have matured, the land may be plowed and planted in some other crop, as cotton, corn, etc. The cultivation necessary for these hoed crops will not destroy the clover seed; at the proper time the seed will come up and make a cover crop. It has been observed that they continue to come up each fall for two or three years.

Some farmers leave balks in clover sod in the spring when they prepare the land for cotton and corn and plow out the balk after the clover seed have matured. Where the rows are made wide, this is a very satisfactory way to secure reseeding. A two foot balk will grow an abundance of seed.

The balk system must be employed with care. On hard clay lands the balk may become weedy and difficult to manage, especially is this probable if the season is extremely dry or extremely wet.

For crops like cowpeas, sorghum, peanuts and sweet potatoes, bur clover will mature its seed in time for the land to be plowed.



Fig. 7. Sod of southern bur clover from seed matured in cotton balks of the preceding year. Photographed in April.