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Circular 307  
(Revised)

# ALFALFA PRODUCTION

IN NORTH CAROLINA



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### Published by

## THE NORTH CAROLINA AGRICULTURAL EXTENSION SERVICE

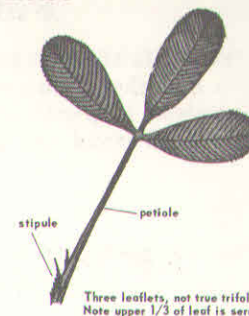
North Carolina State College of Agriculture and Engineering of the University of North Carolina and the U. S. Department of Agriculture, Cooperating. State College Station, Raleigh, N. C., R. W. Shoffner, Director. Distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914.

May, 1963

# ALFALFA PRODUCTION

## IN NORTH CAROLINA

Alfalfa is a deep rooted perennial legume. It will produce 4 to 5½ tons of high quality hay per acre each year for several years on many soils in North Carolina. Alfalfa is exacting in its requirements for good growth; therefore, if you are planning to seed alfalfa, you must do the job right.



## Soil Selection

Alfalfa grows best on well-drained clay soils. However, it will grow satisfactorily on some sandy soils, especially those having clay subsoils.

It is very sensitive to poor drainage and will not live long if planted on a soil that has a high water table or poor drainage. It cannot stand "wet feet."

The field should be fairly fertile and reasonably free of weeds.

### Soil Selection is Most Important

1  
Well Drained  
Clay Soils

2  
Sandy With  
Clay Sub-Soil

3  
High Water  
Table and  
Poor Drainage

## Liming

Take a soil sample and send it to the Soil Testing Laboratory, State Department of Agriculture, Raleigh, N. C., for definite lime and fertilizer recommendations.

The method of liming alfalfa is more important than the rate of liming. Research comparing lime topdressed, plowed down, and mixed in the top 4 inches of soil shows that mixing resulted in 1,000 pounds more forage than plowing down and 2,000 pounds more than topdressing.

As a general rule, soils that have not been limed previously require 1½ to 2½ tons of finely ground dolomitic limestone per acre.

Spread lime uniformly. Poor distribution gives too much lime on some spots and too little on others.

## Fertilization

Fertilization is the key to successful alfalfa production. The less fertile the soil the more commercial fertilizers you must apply to get a good yield. However, even the best soils require fertilization to maintain a good stand and get a good yield over a period of several years.

Ten Year Yield of Properly Fertilized Alfalfa  
(1948-1957)



### At seeding

Follow the soil test recommendations for fertilization. Most soils in North Carolina need 800 to 1,000 pounds per acre of 2-12-12 fertilizer and 20 to 35 pounds (no more) of agricultural borax at seeding. A majority of soils also need 500 to 1,000 pounds per acre of superphosphate.

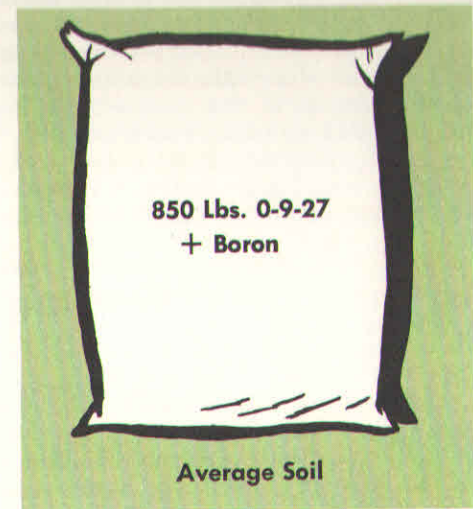
On soils high in potash and low in phosphate, use 1,000 pounds superphosphate and 500 pounds 2-12-12. Alfalfa that is properly fertilized at seeding will not usually require topdressing the first year, except on soils low in potash. On low potash soils a potash topdressing should be made in the spring after seeding in the fall.

### For maintenance

Fertilize according to the yield you want. If you have deep, well-drained soil with a high potential, use the higher rates.

The phosphate level should be maintained by replacing the

## Fertility Needs for Alfalfa Maintenance



Poorer Soils  
will require  
higher rates  
of annual  
topdressing.

phosphorus removed each year. Many red soils supply some potash, so a good topdressing program does not always require complete replacement of potash on these soils. On other soils, especially in the Coastal Plains, most, if not all, of the potash removed should be replaced annually.

One ton of hay removes about 11 pounds P<sub>2</sub>O<sub>5</sub> (phosphate) and approximately 45 pounds K<sub>2</sub>O (potash). Thus a yield of three tons of alfalfa hay per acre removes the equivalent of about 400 to 500 pounds of an 0-9-27 fertilizer while five tons removes about 700 to 1,000 pounds of 0-9-27.

The topdressing should contain 15 to 25 pounds of borax per acre. On established stands that have not received borax, the above amount can be applied with a cyclone seeder.

## Preparing a Seedbed

A good seedbed is firm and well pulverized, has organic matter in the top layer of the soil and also has had the proper amounts of lime and fertilizer worked into the soil. The best way to get this condition is to spread the lime, then cut a cover crop, preferably a legume such as soybeans or lespedeza (not white, red, or Crimson clover, or alfalfa), into the soil with a heavy disk such as a bush and bog harrow 4 to 6 weeks before seeding time. This pulverizes the soil, mixes the lime in the top 4 to 6 inches, and leaves enough vegetation in the surface to prevent the soil from baking.

Disk 10 to 15 tons of stable manure into the soil before planting on severely eroded areas to prevent crusting. *Don't use manure on weedy fields.*

Your land can be settled by lightly disking with a tandem disk and harrowing with a drag harrow. Usually a settling rain or two occurs between disking and seeding time.

Either disk lightly or use a drag harrow to smooth the land, and to kill the weeds that have come up since the first disking. Follow with a cultipacker or roller to firm the seedbed.

Drill the fertilizer into the soil anytime between the heavy disking and the firming of the seedbed. On sloping land, the operations should be on the contour. In fact, contour strips of alfalfa alternating with small grain and row crops on a large field are effective in controlling runoff and erosion and increasing the organic matter and nitrogen content in the soil for a successful rotation.

## Seeding

A cultipacker equipped with an alfalfa seeder attachment is one of the best methods of seeding. Many farmers have gotten successful stands of alfalfa with a cyclone seeder or with a grain drill. Many grain drills have special alfalfa and clover seed hoppers on them.

When seeding with any method other than the cultipacker-seeder, sow one half the seed in one direction and the other half at right angles to the first. Cover the seed with a cultipacker. If a cultipacker is not available, a spike tooth harrow, weeder or brush may be used, followed with some type of roller.

Seed lots from foreign countries have 1 to 10 per cent of the seed colored for your protection, and are not recommended.

## Varieties

Sow 20 to 25 pounds of certified *Cherokee*, *Atlantic* or *Williamsburg* seed per acre and cover lightly (not over  $\frac{1}{2}$  inch). *Vernal* or *Buffalo* should be used on wilt-infested soils. *DuPuits* is a vigorous variety that fits into short rotations, especially in the mountains. *Oklahoma* common can be a very productive variety if seed of the best strains are available; however, with the present seed regulation system we cannot be sure which seed source we are getting.

Orchardgrass at 3 to 5 pounds per acre may be included with alfalfa to: (1) control erosion on slopes, (2) aid in field curing, and (3) help hold back invasion by some weeds.

**Caution:** Use only 3 to 5 pounds since more grass will increase competition and hasten loss of stand, especially if the potash level is not maintained.

New alfalfa varieties are coming! The creeping-rooted variety shown above (see arrow) grew and spread as shown from a single plant in less than one year.



## Inoculation

Inoculation is necessary for good alfalfa stands. It is inexpensive and easy to do. In our area there are conditions (mostly soil and climatic) which may hinder inoculation. For these reasons we urge that inoculum be used liberally and that syrup or molasses in water be used to moisten the seed before the inoculation is added. This will help hold the inoculation to the seed. The syrup will also help feed the bacteria until the seeds germinate and the plants start growing. Absorb excess moisture with cottonseed meal or other drying material before seeding. *Don't use fertilizer to dry seed.*

Inoculate and sow during a cloudy day or late in the afternoon and cover immediately because exposure to the sun kills the inoculum.

## Late summer seedings preferred

Seed early enough to get the plants established before cold weather. This usually assures a better stand and eliminates much of the danger from weed competition. In addition, the plants are ready to start growing the following spring, and the first cuttings of hay are much larger. Following are the *best* planting dates.

Coastal Plains: September 15—October 15

Piedmont: August 15—September 15

Mountains (below 2,500 feet): August 1-31

Mountains (above 2,500 feet): July 20—August 15

Although late summer seedings are more satisfactory, spring seeding can be done on land that is not too weedy and where late summer seeding was impossible. March is best in the Piedmont and April in the Mountains.

## Cutting and Curing

Cut alfalfa in the early bloom stage— $\frac{1}{10}$  to  $\frac{1}{4}$  in bloom, when the new basal shoots appear or when the bottom leaves begin to shed—whichever condition occurs first. It is at this early stage that the protein content is highest.

Cutting too early weakens the plants, and delayed cutting results in excessive shedding of the leaves. At least three, and in most cases four, cuttings can be made each season. Make the last cutting early enough to allow 12 to 18 inches of new growth before the first killing frost.

The curing method should be such as to preserve the green color and prevent the leaves from shattering. The leaves are important because they contain 23 to 25 per cent protein while the stems contain only 10 to 11 per cent.

Regardless of how well the hay is grown, if the leaves are lost, much of the protein is lost. The same holds true for calcium and phosphorus.

To prevent shattering rake the hay into windrows as soon as it is wilted and before the leaves are brittle. The moisture content at which hay can be stored depends on whether or not an artificial drier is used.

For loose storage in a barn or hay shed, a good rule-of-thumb to follow is to twist a handful of the hay to see if there is any moisture. If the tightly twisted stems show little or no evidence of moisture, the hay can be stored satisfactorily.

## Keeping It Productive

Once a stand of alfalfa is established it can be kept productive for several years by proper care.

### Cutting

Don't get "piggish" and insist on cutting too early or too late in the fall. The alfalfa must have a chance to store up food in the root system in order to live over the winter and start growth the following spring. Less than 12 to 18 inches of growth is an indication the fall cutting has been too late. Harvesting this last cutting just at frost time usually costs 2 pounds of hay the next year for each pound harvested in the fall. Don't let animals graze after the last cutting. There is some danger of contaminating animal products with chemical residues from alfalfa weevil control.

### Reseeding

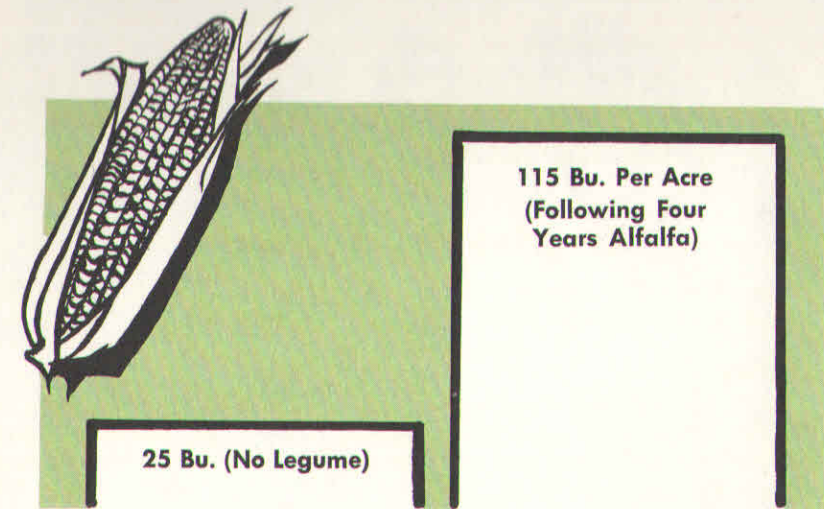
As a general rule, reseeding alfalfa to thicken the stand has not been successful. If a stand becomes thin, seed 5 pounds of orchardgrass per acre after the last cutting. This will add a year or two to the life of the hay crop; will be better than cultivation in preventing the entrance of weeds and crabgrass; and will increase the yield of good hay. The alfalfa-orchardgrass mixture can be used for grazing. Special emphasis should be given to topdressing, especially with potash, or increased competition from the grass will hasten the loss of stand.

### Rotations

The question of following alfalfa with alfalfa has been raised a number of times. Some reasons for not doing this are: (1) disease and insect build-up, (2) increased weed infestation, (3) decrease in pH and phosphorus and potash and (4) nitrogen build-up.

Use alfalfa in rotation with grass crops or other crops that can use the nitrogen left in the soil. Alfalfa is a good gatherer of nitrogen and increases the organic matter content of the soil. At one location in North Carolina, 127 bushels of corn per acre were harvested following 4 years of alfalfa. This yield was obtained without the use of commercial nitrogen as a topdresser. This alone would seem to justify the use of other crops in rotation with alfalfa. Alfalfa is a good erosion control crop on the steeper cultivated land.

## Comparative Yields of Corn (1 acre)



### Grazing

Alfalfa produces good grazing but careful management is necessary or the life of the stand will be short. It can be used as supplementary pasture by grazing an occasional crop of hay instead of mowing. This can be done most profitably when pastures are short and the alfalfa would be worth more for grazing than for hay. The grazing should be rather rapid (as near like cutting as possible), and the plants should be allowed to recover fully before grazing or cutting again.

### Silage

Alfalfa makes good silage and many farmers are putting the first cutting into the silo. Quite often haymaking is difficult at this time of year. The alfalfa should be wilted to 65 to 75 per cent moisture or a dry preservative should be used. Low-moisture silage (haylage, 45 to 55 per cent moisture) offers some promise. This will require complete sealing of the silo.

### Weevil control

Failure to control alfalfa weevil will result in loss of stand. They can be controlled by using the right kind and amount of insecticide at the proper time. Consult your county agricultural agent for the current recommendations on weevil control. Be sure you are using material that is approved by the Pure Food and Drug Administration. The time of application and amounts to apply are quite critical in obtaining best control and in guarding against residue during the following harvest season. Do the job at the right time and use only the right amount!



Alfalfa weevils can be effectively controlled. If not controlled, however, they can severely damage hay crop and stand as shown in foreground of picture above.

## Hay

Haymaking methods are constantly being improved. Drying equipment may be justified on large operations or on farms that produce commercial hay. Crimpers or crushers do speed field curing during haying weather. They should be considered as one possible way to help beat the rain.

# For Better Yields...

## Follow These Points

1. Select a well-drained soil of good fertility, fairly free of weeds.
2. Apply lime and fertilizer on the basis of a soil test. Spread lime uniformly and work into soil before seeding.
3. Fertilize with 700 to 1,000 pounds 2-12-12 containing 20 to 35 pounds of agricultural borax and 500-1,000 pounds of super-phosphate at seeding. (Regular alfalfa fertilizer contains 3-4 pounds borax per 100 pounds.)
4. Prepare a firm, well-pulverized seedbed with organic matter in top layer of soil.
5. Seed 20 to 25 pounds inoculated Cherokee, Atlantic, or Williamsburg seed per acre in late summer. DuPuits for short rotations. (Use Vernal or Buffalo on wilt infested soils.) Cover lightly.
6. Control the weevil. Consult your county agricultural agent for latest recommendations on kind and amount of material and time of application.
7. Cut in early bloom stage. Allow hay to wilt in the swath, but rake into windrows before leaves become brittle. Crimpers or crushers speed field drying time.
8. Manage properly—topdress annually after first year's growth with 500 to 1,000 pounds 0-9-27, 0-10-20 or 0-25-25 containing 15 to 25 pounds of borax.