



**LADINO
CLOVER
PASTURES**

Contents

Introduction	3
Varieties	4
Pastures	5
Mixtures	5
Acreages required	6
Soils	6
Liming and fertilizing	7
At seeding	7
Topdressing of established fields	7
Seedbed preparation	8
Seeding	8
Management	9
Rotation grazing	9
Ration grazing	10
Clipping	10
Some problems	10
Renovation	11
By rotation	11
By minimum tillage	11

Use of trade names in this publication does not imply endorsement of the products named or criticism of similar ones not mentioned.

Prepared by

S. H. Dobson, E. L. Kimbrough, Jack V. Baird, Agronomy Extension Specialists; W. W. Woodhouse, Jr., Professor, Crop Science; D. S. Chamblee, Professor, Crop Science; Joseph C. Burns, W. A. Cope, Agronomists, ARS and Crop Science; John Falter, Extension Entomologist; Leon T. Lucas, Associate Professor, Plant Pathology.

Published by

THE NORTH CAROLINA AGRICULTURAL EXTENSION SERVICE

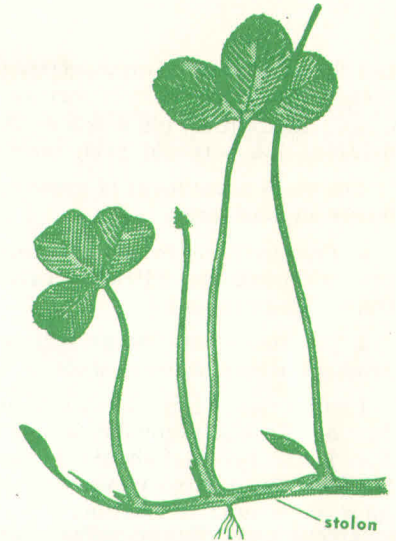
North Carolina State University at Raleigh and the U. S. Department of Agriculture, Cooperating. State University Station, Raleigh, N. C., George Hyatt, Jr., Director. Distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914.

4/77/5M

(Reprint)

AG-72
(Formerly Circular 301)

LADINO CLOVER AND GRASS PASTURES



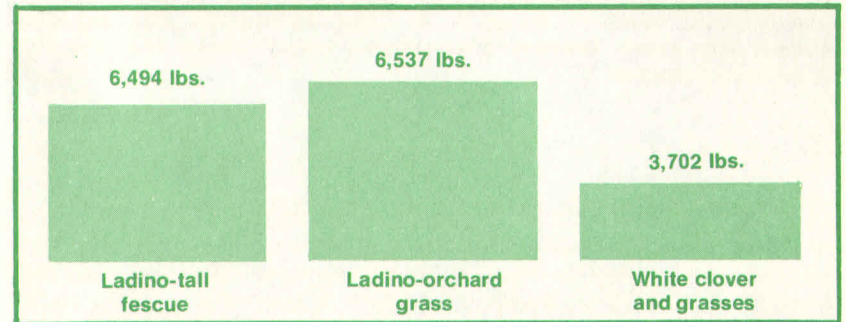
Ladino is a giant strain of white clover. Leaf stalks and leaflets are large and few seed heads are formed. It spreads by fleshy, creeping stems or stolons that root at the nodes.

Ladino clover is the principal grazing forage legume in North Carolina. It is usually grown with a companion grass. Ladino can be used for silage or hay during seasons of lush growth. However, such management often leads to quicker loss of clover stands due to excess competition from the grass. It is usually difficult to make high quality hay out of ladino during most seasons.

Where the making of "grass" silage could fit into an operation, this would be better from the standpoint of saving the nutrients and getting the pasture cut early while the ground is still moist. (See Forage Memo No. 27, *Silage from Pasture and Hay Crops*.)

Legume-grass and pure grass pastures can be profitably used on most farms suitable for pasture in North Carolina. Each farmer should maintain, on his farm, an appropriate acreage in legume-grass such as ladino-

Use Ladino Mixtures for Best Pasture Yields



tall fescue or ladino-orchardgrass, and pure grass such as tall fescue, orchardgrass, Kentucky bluegrass, Coastal bermudagrass, etc., according to soil capabilities, plant adaptation, livestock requirements, cost of production, and personal preference.

The main advantages of growing ladino-clover grass mixtures on soils where adapted, are:

- The quality of forage is superior to most pure grasses, especially for cow-calf programs. (Heavier calves are usually weaned off clovergrass than off pure grass.)

- On sites where clover will persist for 3 or more years, the cost of production may be lower since no nitrogen is required.

Ladino clover has two basic weaknesses, one being low summer production. Coastal bermudagrass or summer annuals (pearl millet or sorghum-sudan hybrids) should be used in hot weather. The other weakness is short life. Ladino clover maintains production from 2 to 4 years or more, depending on location.

Varieties

Tillman has been most productive in the official variety tests, followed closely by Regal. Certified West Coast varieties are still good but generally do not persist as long as Tillman. Intermediate and small type varieties are less productive and no more persistent.



Ladino clover—tall fescue pastures supplemented with limited grain make excellent gains in spring and early summer.

Pastures

Ladino clover is generally grown with a grass. But pure stands of ladino are preferred for hogs. As a pasture crop, it has several advantages:

- High quality forage.
- High carrying capacity.
- Long growing season.
- High mineral content.
- Perennial nature (although short lived).
- Fast recovery from droughts.
- 20 to 30 percent protein content.



This is a rotational pasture used for grass silage in the spring while pure fescue is still good. The later growth is grazed when fescue in pure stand gets coarse.

Mixtures

Ladino-orchardgrass mixtures grow a little more in late spring and summer than tall fescue mixtures. Ladino-tall fescue mixtures grow slightly better during the cooler part of the growing season.

Where possible, it is best to grow both mixtures on the same farm. There is little difference in total yield of the two mixtures.

Orchardgrass is more palatable and less competitive with ladino clover than tall fescue. Tall fescue (1) is better adapted to wetter soils, (2) can generally stand more adverse conditions, (3) does not frost back

as much as orchardgrass, and (4) is better when accumulating growth for fall and winter grazing.

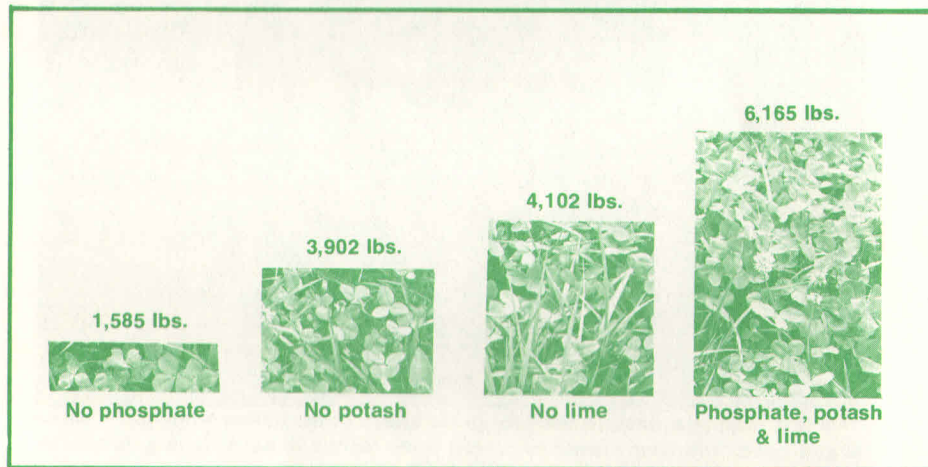
Acreages required

Ladino and ladino-grass mixtures grow during more months of the year than other grazing mixtures. However, there are several months of the year when other roughages such as Coastal bermudagrass, summer annuals, hay and/or silage must be provided in the total forage program.

For a good grazing program, one should supply $\frac{1}{2}$ to $\frac{3}{4}$ acre of Ladino-grass per animal unit*, one-fourth acre of supplementary grazing for summer—plus another $\frac{1}{4}$ acre of tall fescue or winter annuals for winter. This acreage can be adjusted according to land available. If hay and silage are fed in large quantities and produced on other acreages, reduce ladino acreages.

Store any surplus ladino growth during a good year to take care of future low yielding years.

Proper Fertilization a Must



In some experiments, when phosphorus was omitted, yield of ladino was reduced about three-fourths. Lack of potash or lime cuts yields by about one-third.

Soils

Ladino grows best on moist, fertile soils. However, it will grow successfully on less fertile soils when properly limed and fertilized. It can be grown on most clay soils and on some "crayfish" soils not suited for row crops. Ladino is not adapted to light, sandy soils.

* Animal unit designates 1,000 lbs. of live weight.

Liming and Fertilizing

The nutrient requirements for ladino clover are high. If properly inoculated and established, ladino clover will supply nitrogen for its own growth and that of the grass when growing in a mixture. Most of the other nutrients, however, must be supplied from fertilizers or manures and limestone.

At low or declining fertility levels, ladino will disappear rapidly. On the other hand, it will produce more than any pasture legume available if seeded on suitable soil properly fertilized and managed.

At seeding

At least 75% of the soils in North Carolina used for pastures are low in phosphorus, and need considerable lime. A soil test will determine the amounts to use. Spread the recommended amount of lime on the land and work it into the soil before seeding.

Use manure if available, especially on soils that are low in organic matter, badly eroded, or where winter annual weeds are not a serious problem. Five tons of manure per acre will reduce the amount of mineral fertilizer needed by about 100 pounds an acre. The following table lists fertilizer suggestions for many situations revealed by soil tests.

Fertilization based on soil tests

Phosphorus Level	Potash Level	Suggested Fertilization
Very low	High	500-1000 lbs. superphosphate (broadcast) plus 500 lbs. 2-12-12 (seeding)
Medium	Medium	800-1000 lbs. 2-12-12 (seeding)
High	Low	500-700 lbs. 2-12-12 (seeding) plus 150-250 lbs. muriate of potash per acre in midsummer of first growing season.

Topdressing of Established Fields

To maintain the sod in a productive state, topdress every year after the first year. As a general rule, 400 to 600 pounds of the following fertilizers are suggested: 0-10-20, 0-9-27, 0-14-14. The higher potash fertilizers are usually preferred for maintaining longer lived stands. The following table, listing nutrient removal, emphasizes the need for adequate fertilization.

	Pounds of Nutrients Removed—1 Year's Growth				
	Yield	N*	P ₂ O ₅	K ₂ O	CaO
Ladino-Orchard grass	6223	190	54	216	63
Ladino-Fescue	5939	168	53	202	46

* Nitrogen largely produced by inoculated legumes.

Seedbed Preparation

When seeding ladino clover on new pasture or renovating old pastures, it is highly advisable to (1) forget about the plants that are on the land, (2) relime if needed, (3) refertilize, and (4) prepare a new seedbed.

Make sure the seedbed is well pulverized, fairly shallow, but smooth and firm on top. Plowing is not necessary if a heavy disk is available. Disk or plow in time to permit a rain to settle the seedbed. A crust will form on many soils following a rain. It is necessary to break this crust before seeding. If available, use a cultipacker for firming and smoothing the seedbed and also for covering the seed.

The following operation will produce good ladino growth:

1. Test the soil.
2. Spread lime and phosphate uniformly.
3. Disk thoroughly.
4. Smooth the seedbed.
5. Fertilize before seeding.
6. Firm with cultipacker.
7. Seed uniformly, cover lightly.

(See Extension Circular No. 308, *Seedbed Preparation for Pastures and Alfalfa*.)



Make sure the seedbed is properly prepared. Several methods are workable, but the heavy cultipacker is one of the best for firming and seeding.

Seeding

Ladino clover seed must be inoculated. It is difficult to distinguish it from other strains of white clover. For this reason, certified seed is recommended for planting. (See Forage Variety Test Reports.)

Uniform distribution of seed is essential for good stands. Seed at the rate of 2 to 5 pounds of ladino clover with 10 to 12 pounds of orchard-grass per acre, or 8 to 10 pounds of tall fescue. Seed 3 to 6 pounds of

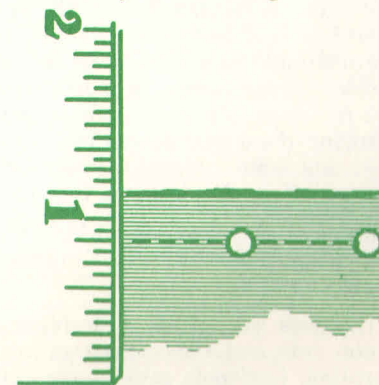
ladino alone to get a pure stand for hogs. On cloddy seedbeds or when seeding time is unavoidably delayed beyond optimum time, use 25% more seed than the rates shown above. In general, in the Piedmont a ton or more of extra forage may be obtained the first year by seeding 4 to 5 pounds of ladino per acre, rather than 2 pounds. As the rate of clover is increased the rate of grass should be increased.

Most seed covered more than $\frac{1}{4}$ inch cannot be expected to emerge. Late summer and early fall seedings are generally more successful: In the Mountains—late July and August; in the Piedmont—August and September; and in the Coastal Plain—September and early October.

Spring seeding can be made on fairly weed-free moist land. The chances of failure are greater and there is not as much growth the first year as from fall seedings.

Number of seedlings established per square foot 20 days after seeding.

	Depth of Seeding		
	$\frac{1}{4}$ "	1"	2"
Ladino (2 lbs.)	—	—	0
Orchardgrass (6 lbs.)	48	22	2
Tall fescue (12 lbs.)	48	34	12



Never seed Ladino deeper than $\frac{1}{4}$ -inch.

Management

Rotation grazing

Ladino clover can be grazed continuously if not grazed closer than 2 inches. However, the most practical way to get good management is to divide the pastures into three or more parts. This way, rotation grazing is easy; also, certain pastures can be left ungrazed during the lush period and be cut for hay or ensilage.

The grazing season of your ladino pastures can be extended by letting growth accumulate during late summer.

Close grazing reduces yield. If done during periods of extremely hot and dry, or cold weather, stands will be damaged.

Ration grazing

Ration or strip grazing is a system where animals are given a fresh section of grazing each day or every few days. This type of grazing is beneficial if labor is available.

Clipping

Certain annual weeds and irregular pasture growth can be controlled by clipping. Keep growth even and appetizing to animals by clipping to prevent heading and to keep weeds from seeding and spreading. Two or more mowings each year may be required. Allowing the grass to head out and remain in this stage for 30 days is usually real damaging to the legume.

Some problems

Bloat is a hazard during the spring or lush period of ladino. When bloat is considered to be a danger, some new bloat preventative chemicals are available and should be fed to the animals during the early lush period. Never turn a hungry, starved animal on lush ladino. A good practice is to allow animals to graze grass pasture several days before allowing them free access to lush ladino. Also, provide plenty of shade, salt, and water. Many farmers believe the addition of a stack of loose hay, straw, or shucks in pasture reduces bloat danger.

Remove all poisonous plants from pasture before turning the cattle in. (See Experiment Station Bulletin No. 414, *Stock Poisoning Plants of North Carolina*.)

Diseases are often a problem in ladino-grass pastures. Root and stolon rots and virus diseases are major problems in ladino in North Carolina. Leafspots cause some damage on ladino clover but are usually not severe. Nematodes can be a problem in some soil types. Several fungus diseases can cause severe damage to grasses.

No fungicides are cleared for use on pastures for grazing, therefore management practices are the only ways to prevent and control the fungus diseases. Low levels of nitrogen on cool season grasses during the summer and grazing or mowing to prevent the accumulation of large amounts of foliage will help to prevent fungus diseases on ladino and grasses. Large amounts of foliage maintain humid conditions which encourage fungus disease development. A good insect control program may help reduce the spread of virus diseases in Ladino clover.

Insects: There are two important insect pests of ladino clover in North Carolina; the alfalfa weevil and the green June beetle. The small green alfalfa weevil larvae vigorously attack new growth in the spring, and when abundant, they may severely damage the crop. Watch closely for signs of feeding and apply insecticides according to the *North Carolina Agricultural Chemicals Manual*.

Larvae of the green June beetle are regularly a problem in manured and heavily grazed pastures. The manure attracts adult beetles for egg

laying. Observe pastures in September for areas worked up by the grubs. These cream-colored grubs, which crawl on their backs, don't feed on living tissue but injure plants by pulverizing the soil. To control, broadcast a treatment of carbaryl (Sevin) spray or granule to infested areas.

Probably the most serious insect damage to Ladino clover pastures is the clover and alfalfa weevil. Quite often, one spray in the spring is needed and will help save the stand. Pea aphids appear to damage stands by spreading viruses and therefore should be controlled. Also, armyworms sometimes invade pastures and should be controlled. (Effective insecticides are available and approved for use on these pests in pastures. See the *North Carolina Agricultural Chemicals Manual*.)

Renovation

Rotation

When the percentage of ladino falls below 15 or 20 percent of the stand, one of two things should be done: (1) treat the fields as if there were no clover; and if there is a good stand of grass—fertilize with nitrogen, phosphate and potash; or (2) begin a renovation process by rotating crops.

One can usually produce higher quality, lower cost forage with clover-grass than with pure grass on soils well-suited for clover. Rotation simply means to follow clover-grass with other crops for 1 to 3 years. Don't use crops that are too closely related to clover because of disease and other problems. It is generally a good idea to use tall grass crops such as corn, millet or sorghum-sudangrass hybrids. These grasses use the build-up of nitrogen left by the clover. However, soybeans can be used, as well as other crops, to smother our weeds before returning to pasture. After 1 to 3 years of rotation, clover or clovergrass can be established again. Then follow the recommendations mentioned earlier.

Minimum tillage

Another form of renovation is to reseed the legume (ladino clover) in the grass sod (tall fescue or orchardgrass) with minimum tillage following heavy grazing. The sod should be disked or ripped until soil is loose enough for seeding with a drill or cultipacker seeder. An important factor is to cover the legume seed with some soil (preferably about ¼ inch). Firming the soil around the seed with a packer allows for better soil contact of the young germinating seedlings and therefore results in better stands. These seedings should be made about October 10 to 20 in central North Carolina. Earlier seedings in a heavy grass sod result in severe stand losses due to grass competition and insect damage. If most of the grass sod is destroyed, earlier (September) seedings are suggested. Late winter (February and March) seedings can also be made successfully. Much remains to be learned about the advantages and disadvantages as well as the techniques of re-establishing a legume in a grass sod; however, several farmers have had real success. In all cases, lime and fertilizer deficiencies should be corrected prior to seeding and no nitrogen fertilizer should be used.

