

NO-TILL PASTURE RENOVATION

JOE BURNS

Maybe a better title would be minimum tillage pasture renovation because, in many cases, there is some small amount of tillage performed in order to place the clover seed into the soil. On the other hand, the so-called "spray-seed" method can be completely no-till with clover being broadcast on the soil surface.

In Tennessee, the term pasture renovation means the seeding of clovers in grass sods, mainly fescue. In other areas, renovation might mean the seeding of sudangrass in pasture sods or seeding fescue or orchardgrass in old lespedeza or bermudagrass pastures, or seeding small grains, ryegrass and legumes in bahia and bermudagrass fields. With few exceptions, the basic principle of successful renovation is to prevent or decrease competition between the existing sod and the newly-seeded clover or grass. This competition can be decreased by: chemical spraying of the existing sod, disking or mechanical destruction of part of the sod or, in the case of bermudagrass, waiting until the sod is dormant before seeding.

The advantage of having clover in fescue pastures is well documented from research in many states. A clover-fescue pasture, from Tennessee research, produced as much gain from steers as a comparable pasture of fescue fertilized with 80 lbs. of nitrogen per acre. In a Tennessee cow-calf demonstration, renovated fescue produced a three-year average of 105 pounds per acre of calf beef more than fescue alone. This 36-acre pasture was divided in half with one-half seeded with 2 lb. Ladino clover, 4 lb. red clover, and 8 lb. Kobe lespedeza per acre and fertilized by soil test while the other half was not renovated. The results were even more striking when fescue alone was grazed with dairy cattle and compared to renovated (fescue-clover) pasture. The increase was 6 lb. of milk per cow per day for the clover-fescue mixture over the fescue alone. Clover-grass mixtures are also desired by most horse owners, especially when the grass is fescue and they have mares with foals and young horses less than two years old.

Fescue is the major pasture plant in Tennessee, comprising about 5 million acres, and less than 1 million acres have an acceptable clover content of 30 percent or more. This shows the need for more clover in Tennessee pastures (2-4-8, Let's Renovate).

Now, back to the subject of no-till pasture renovation.

Some of the early work on no-till renovation was done in Tennessee by Henry Fribourg et al (1) of the Plant and Soil Science staff in 1957. Henry used a disk and also the chemical dalapon to kill part of a heavy stand of fescue before seeding clover. He found that an adequate stand of clover could be obtained if the fescue competition were reduced by either method in fall or spring.

Joe Burns is Forage Specialist, Extension Plant and Soil Science Section, The University of Tennessee, Knoxville, Tennessee.

Strips of fescue were sprayed with dalapon ranging from 36-inch wide alternate strips down to 9-inch sprayed strips with 14-inch unsprayed bands. The 9-inch sprayed strips with 14-inch unsprayed bands resulted in the most desirable combination of fescue and clover after broadcast legume seeding.

Some subsequent work in Tennessee and Alabama has shown that the application of an insecticide is needed for fall clover seedings because of insect damage to the seedlings. Winter seedings do not seem to have the insect damage observed in fall plantings and therefore no insecticide is suggested. In general, in Tennessee, winter and early spring seedings (February and March) have been more successful than fall or later spring seedings.

Research by Taylor, Smith and Templeton (2) in Kentucky showed 10 to 20 percent greater number of clover plants after spraying paraquat in 4-inch strips over a treatment consisting of clover seeded in rows in Kentucky bluegrass plots, in three of five trials. Also, the clover plants were 20 percent larger after 60 days for two March seedings.

In later research in Tennessee by Fribourg, Jeffery et al (3 and 4), Paraquat, Roundup, Dalapon and disking treatments were used to suppress fescue at time of clover seeding. The clover was seeded in 8-inch rows on one-half of each plot and broadcast on the other half. All chemicals were sprayed in 4-inch bands and there was one broadcast treatment of paraquat. Paraquat resulted in the quickest browning of the fescue, with Roundup and Dalapon having slower effects. The disking treatment had a 20 to 25 percent lower yield than the paraquat treatment in 4-inch alternate bands for two seeding dates in late February and early March. Disking to kill about 50 percent of the fescue also slowed the growth of the remaining grass and resulted in lower yields. The clover establishment and growth were about the same in the chemical and disking treatments. When seeded in late February and early March, the growth of clover seeded broadcast was equal to that of clover seeded in rows with a zip seeder, when the yields were taken in early June. From mid-March to mid-April, there was a trend toward better stands when the seed was put in rows in the soil as compared to broadcast seedings.

Clover seeded in fescue in late February and early March by any method and all chemical or mechanical treatments produced more growth and had better stands than that seeded in late March and April.

Several researchers have reported that it is easier to maintain clover with fescue if the fescue is seeded in rows. With this information, it is easy to realize that the spraying of a chemical in alternate bands to kill or suppress fescue for a couple of years would be putting fescue in rows. This would allow the clover to have the physical area between bands for growth without heavy competition from the fescue. Also, as has been reported, the fescue in the unsprayed bands is not reduced in vigor and can supply much needed forage in early spring. When this fescue growth is removed by grazing, competition is further reduced, trampling and grazing damage to the young clover seedlings (one animal unit per

acre) are minimal. It has also been observed that nitrogen fertilization of a pasture renovated by band spraying supplies early season growth without causing excessive competition, if grazed to a stubble height of 2 to 3 inches.

Some of the advantages of no-till or minimum-till pasture renovation are:

- I. Heavy stands of fescue can be easily renovated, the paraquat does an excellent job of "suppressing" the fescue if the grass is green.
- 11. The soil surface remains smooth; disking leaves the pasture rough.
- 111. Rocky areas can be sprayed without bringing more rock to the surface.
- IV. Wet soils can be sprayed before they are dry enough for disking.
- V. Fescue can be put in rows by killing or suppressing alternate bands, allowing more space in killed areas for clover growth.
- VI. Unsprayed bands of fescue produce higher yields per acre for the first 60 to 90 days after spraying alternate bands than similar areas in a pasture which were disked to kill about 50 percent of a thick stand of fescue.
- VII. Soil erosion is less even though erosion is only slight with the disking method because a 59 percent stand of fescue should remain after disking.

Disadvantages :

- I. With thin fescue stands, only slight disking would be needed. A 50 percent kill of existing grass by spraying would be excessive.
- 11. The grass must be green before paraquat is effective, therefore, seeding might be delayed in some areas during February.
- 111. Most farmers have machinery to renovate by the disking method.

The question now arises, what is a practical method of no-till renovation?
(5)

SPRAY-SEED OR ZEBRA METHOD

- a. Spray 10-inch alternate bands with a boom sprayer and broadcast the seed with a cyclone seeder, grain drill or cultipacker seeder, etc. Most of the boom sprayers have nozzle openings at 20-inch intervals. The fan spray tip can be turned, in order to only spray a 10-inch band.

- b. Spray 4- to 5-inch alternate bands with one of several machines which places the seed in rows in the soil. Powrtill, Zip Seeder, Pasture Pleaser, Bettison Drill, etc.
- c. Use 1 quart of paraquat per sprayed acre (one-half area sprayed = 1 pint/A) in 20 to 40 gallons of water. Add 8 Oz. of Ortho X-77 per 100 gallons of spray solution.

* * * *

Regardless of the method used, a jingle which is used in Tennessee to emphasize renovation is:

SPRAY OR DISK PASTURES - SEED THEM FAST
PUT SOME CLOVER - IN THAT GRASS!

LITERATURE CITED

1. Fribourg, H. A., and Lawson M. Safley. 1962. Renovating fescue pastures with dalapon. Tennessee Farm and Home Sci. Prog. Rep. 42.
2. Taylor, T. H., E. M. Smith, and W. C. Templeton, Jr. 1969. Use of minimum tillage and herbicide for establishing legumes in Kentucky bluegrass (Poa pratensis L.) swards. Agron. J. 61:761-766.
3. Fribourg, H. A., L. S. Jeffery, J. R. Evans, J. High, Jr., D. D. Howard, and H. Morgan, Jr. 1978. Clover establishment in fescue sods following renovation with disking and herbicides. Tennessee Farm and Home Sci. Prog. Rep. 105.
4. Jeffery, L. S., H. A. Fribourg, J. R. Evans, D. D. Howard, J. W. High, Jr., and H. Morgan, Jr. 1978. Suppression tall fescue sods with disking and herbicides for pasture renovation. Tennessee Farm and Home Prog. Rep. 105.
5. Burns, J. D. 1978. Renovate grass pastures. Tennessee Agric. Ext Serv. Circ. 714.