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Sod Seeding Birdsfoot Trefoil and Alfalfa

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Michigan has over two million acres of permanent grass pastures and hayfields which are generally low in productivity. Much of this area is fenced and suitable for pasture.

The yield of these pastures or grassy hayfields can be doubled or tripled by grazing heavily in the spring, plowing or field cultivating in late May or early June, tilling every 7 to 10 days to control quackgrass and other grasses, and seeding in late July or early August. Mixtures of a grass(es) on well-drained soil or with birdsfoot trefoil on wetter sites are recommended. A complete description of this procedure is presented in Extension Bulletin E-527, "Re-establishment of pastures and hayfields in one year." Based on 10 years of excellent experiences from farmers, this is the number one choice of re-establishment of legumes and grasses where plowing and/or field cultivation will not result in excessive erosion.

Seeding of birdsfoot trefoil in herbicide-treated sod without plowing is an alternative which has given satisfactory result in MSU trials in 1973, 1974 and 1975 (Table 1). Trefoil is tolerant of acid soils and will grow well at a pH of 5.5 and even 5.0. It yields more at higher pH levels. Incorporating a legume into a grass

sod increases yields and protein content of the pasture and gives more production during the drier part of the summer. The legume supplies "free" nitrogen from the air to the grass at low cost.

Sod seeding in Michigan is generally not recommended for alfalfa (the primary legume used in pastures renovated by tillage) since many soils are acid and need lime. Incorporation of lime is necessary to

TABLE 1. Total tons hay in 1974 and 1975 of birdsfoot trefoil (BFT)-grass and % BFT after drilling or broadcasting 6 lb of seed with 0-46-0 fertilizer on May 3, 1973, on a sprayed* or unsprayed bluegrass-orchardgrass-timothy-brome grass sod. Poorly drained conover loam.

Seed Placement	1974				1975			
	paraquat		No paraquat		paraquat		No paraquat	
	Tons	%BFT	Tons	%BFT	Tons	%BFT	Tons	%BFT
Drilled, 1/2" deep	2.14	47	2.17	2	4.17	59	2.14	6
Broadcast, surface	1.78	26	1.84	1	2.83	38	2.10	4

*Sprayed, 1/2 lb paraquat active ingredient per acre plus X-77 surfactant.

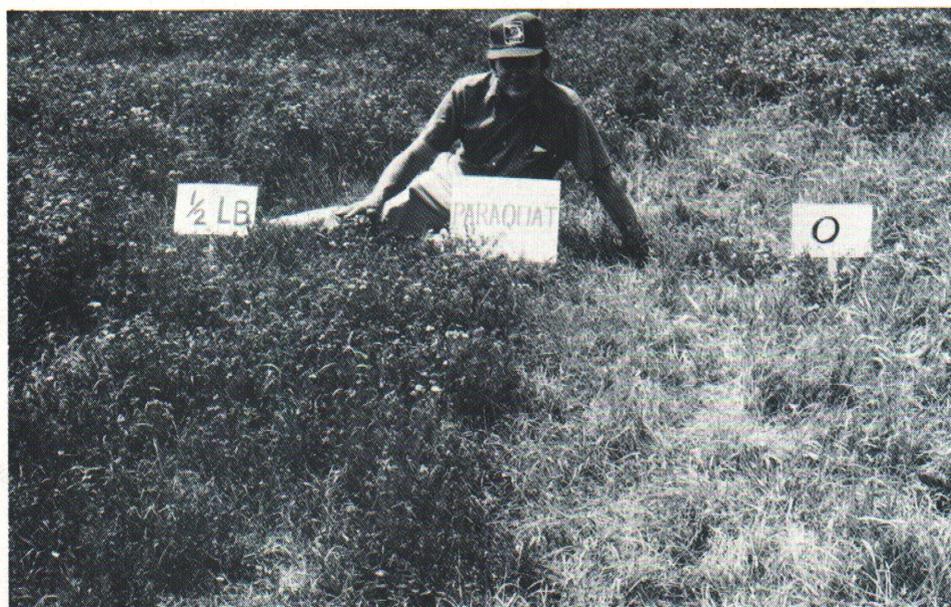


Fig. 1. Excellent stand of birdsfoot trefoil two years after seeding (see drill, Fig. 3) in a paraquat-treated bluegrass-timothy-brome grass sod.

increase the soil pH to 6.8 or above, as recommended for alfalfa. If the pH is above 6.0 on these sites, which are generally hilly and well-drained, sod seeding of alfalfa is satisfactory method of improving forage productivity without addition of lime.

Birdsfoot trefoil is a perennial, productive pasture legume which will tolerate acid soils so the addition of lime is generally not necessary on most soils. It thrives best on soils too poorly drained for alfalfa, but will yield well on rolling soils. Trefoil can be established successfully in sods composed primarily of Kentucky bluegrass, orchardgrass, bromegrass, or timothy if the grass competition is reduced during establishment. The grass will recover later and provide good forage for livestock in the year after seeding.

The following steps should be followed to help insure a good stand of birdsfoot trefoil or alfalfa by sod-seeding in grass:

1. Site Selection

Select a sod primarily of Kentucky bluegrass (Junegrass), timothy, bromegrass or orchardgrass which can be subdued by the paraquat herbicide. Since quackgrass (*Agropyron repens* L.) is not suppressed adequately by paraquat, sod seeding should not be made in sods predominately quackgrass.

Select a moist site with a loam, clay loam, or clay soils for trefoil and a well-drained soil for alfalfa. Spring establishment of alfalfa has been satisfactory on coarse-textured soils such as sandy loams and even loamy sands. Summer establishment is more hazardous because of drouthy conditions.

2. Soil Test

Determine phosphorus and potassium needs by taking representative soil samples. Soil samples should be sent to the Soil Testing Laboratory of Michigan State University, East Lansing, 48824.

3. Graze Closely

Grazing before seeding will reduce grass vigor and competition and improve the stand of trefoil. Fall grazing prior to spring seeding is recommended.

4. Apply 2,4-D

One pound 2,4-D ester active ingredient per acre should be applied about 7 to 10 days before seeding to kill most broadleaved weeds, particularly dandelion. If 2,4-D is not used, the stand may be crowded out by the perennial broadleaved weeds.



Fig. 2. Moist inoculation of birdsfoot trefoil or alfalfa with specific *Rhizobia* inoculant just before seeding is necessary.

5. Spray with Paraquat

Paraquat is the only herbicide presently available, adequately tested, and cleared for use. It will suppress all grasses, except quackgrass, adequately for seeding. Spray on the sod at 1/2 pound active ingredient per acre prior to seeding or during seeding. Use a surfactant like X-77 to insure good coverage of the foliage. Paraquat will not injure the dormant seed.

6. Seed in April or Early May

Seed in April or early May, as early as possible, to get the benefits of spring rains. A regular fertilizer-grain drill with legume seed box will insure good seed placement. Most farmers own this type of drill. The seed tubes of the legume seeder attachment should be adapted so the seed falls into the fertilizer shoe beside the disk. The tension on the disks should be adjusted to place the seed and fertilizer about 1/2-inch deep. The soil should be moist enough to make a slit 1/2-inch deep in the sod. A cultipacker towed behind the drill will help insure coverage of the seed in the 1/2-inch deep slits.

A no-till corn planter set for 20- to 30-inch rows can be used satisfactorily to drill seed and fertilizer into a sod. The rows are split with a return pass of the planter for 10 to 15-inch rows. The granular insecticide boxes are used for seed metering and a seed tube is dropped in front of the press wheel. Coulters are set shallowly so seed is no more than 1/2 inch deep.

Drills such as the Zip Seeder specifically designed for seeding in sod work as well as, and possibly better than, the regular drill described above but they are not as readily available.

Satisfactory results have also been obtained on a moist, poorly-drained soil by broadcasting trefoil seed

and fertilizer in April or early May on top of the herbicide-treated sod (Table 1).

Summer seeding is more hazardous than spring seeding. If a commercial drill adapted for seeding is used in summer, a cultipacker must be used after seeding. Broadcast seeding of trefoil or alfalfa in the summer is not advised because of drouthy conditions.

Use 5 to 6 pounds of moist-inoculated Empire, Carroll, Leo, or Viking birdsfoot trefoil seed per acre. **Be sure to use only birdsfoot trefoil inoculant.** Empire and Carroll tolerate grazing better than Viking or Leo which are more erect and easier to establish than Empire. Carroll, a new variety, is almost as easy to establish as Viking and appears to be as resistant to close grazing as Empire. If alfalfa is used, 12 to 15 pounds per acre of an inoculated, wilt resistant, hardy alfalfa such as Vernal, Iroquois, Pioneer 520, Weevlehek, Titan or WL 202 are recommended.

Band about 100 lbs of 0-46-0 or 250 lbs of 0-20-10 or equivalent in contact with the seed. The phosphate in these fertilizers is most important in seedling vigor and good root development. This amount of potassium in contact with the seed will not reduce germination. If soil tests indicate a larger amount of potassium is needed, it can be broadcast before or after seeding or even later in the summer or early fall.

7. Graze and Mow to Reduce Competition

Grazing or mowing when the seedlings are three to six inches tall will reduce grass competition and not

hurt the seedlings materially. Graze rotationally by grazing, resting for 5 to 6 weeks, and then grazing again. If necessary, mow weeds as closely as possible after grazing.

Birdsfoot trefoil will not produce much forage the first year but should be well established in the grass in the second year. Alfalfa may produce up to a ton of dry forage the first year.



Fig. 4. The Zip Seeder, specially designed to seed legumes and grasses with fertilizer, has produced good stands in sods suppressed with paraquat.

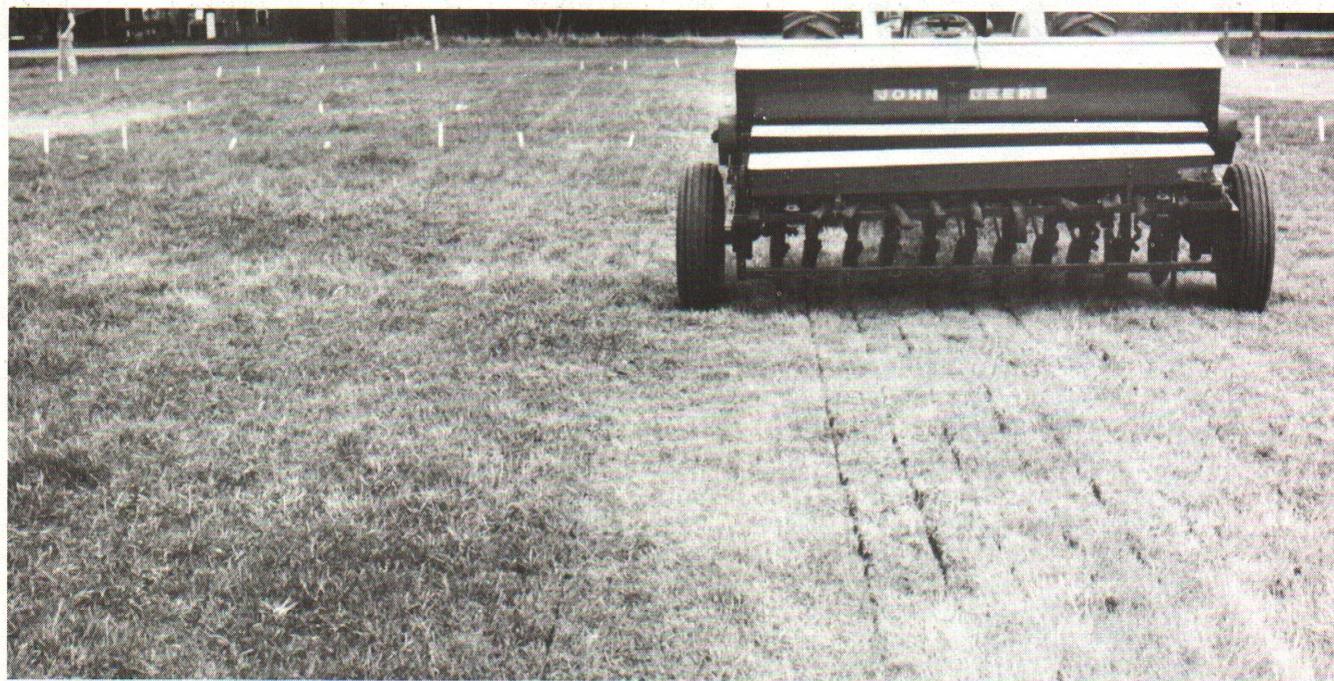


Fig. 3. A regular fertilizer-grain-legume drill adapted to place legume seed and fertilizer in the 1/2-inch-deep slit made by the disks on a paraquat-treated sod has given good stands of legumes. (See Fig. 1)

8. Graze and Fertilize Properly

Fertilize the established stand annually with potassium and/or phosphorus according to Extension Bulletin E-550. About 300 pounds of 0-14-42 per acre every other year for trefoil is adequate on most soils.

Alfalfa should be topdressed annually with about 300 pound 0-14-42 per acre. Boron at one pound per acre may increase legume yields on coarse-textured soils.

Rotational grazing will help establish and maintain a good trefoil stand. Rotational grazing is absolutely necessary to maintain alfalfa.



Fig. 5. Paraquat suppressed a bluegrass-brome-timothy sod adequately for an excellent stand of alfalfa seeded at 12 pounds per acre with a Zip Seeder. (Spinks loamy sand soil.)