

Re-establishment of Pastures and Hay Fields in One Year

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Successful establishment provides 3-8 years of alfalfa-bromegrass instead of unproductive bluegrass or quackgrass.

Highly productive and nutritious forage can be established in one season to replace unproductive grasses such as bluegrass (Junegrass) or quackgrass in old pastures and hayfields. Alfalfa-bromegrass, the primary legume-grass mixture for well-drained areas, produces season-long grazing or hay with yields of 3.5 to 4.5 tons of forage per acre.

Tillage alone, or in combination with dalapon and/or 2,4-D and good management practices, is necessary to kill or subdue the unproductive grasses and weeds. Figure 1 on page 2 shows a hilly Emmet sandy loam soil area in Grand Traverse county at the beginning and at the completion of a re-establishment program. The original Junegrass pasture produced one ton per acre of low-quality forage. This field was improved to produce an annual average of 3.8 tons per acre of alfalfa-bromegrass for six years.

One Year Instead of Two

Since 1960, research work at Michigan State University has shown that many unproductive pastures and hay fields can be improved in one growing season by:

1. Using herbicides and/or tillage to control competition from existing vegetation, primarily quackgrass, and for soil preparation.

2. Band seeding in summer for better stands.
3. Omitting oats in seeding establishment.
4. Using the proper forage mixture.

Using the new system of re-establishment, a farmer can decide in the spring to improve an unproductive area and the field will be ready for grazing or hay the following spring. Furthermore, the old sod can be pastured during the spring prior to tillage and will produce about 60 percent of the potential annual production of grass prior to that time.

Where to Start — The best land should be selected first since it has the greatest potential for improvement. Cleared land in sod requires less preparation than wooded areas.

Determine Soil Needs — Sample and test the soil for pH (acidity), phosphorus, and potassium.

Correction of soil pH usually is a necessary step in obtaining a good stand and subsequent high production of forage legumes. Apply lime in late fall or early spring on the old sod to bring the soil to a pH 6.8 for alfalfa or 6.2 for birdsfoot trefoil.

Fertilize at seeding time according to the soil test recommendations. Generally about 80 pounds per acre each of P_2O_5 and K_2O will be needed (400 pounds of 0-20-20-fertilizer). Extension Bulletin 159, "Fertilizer Recommendations for Michigan Crops,"



Figure 1. (Upper photo) Seeding of alfalfa bromegrass in re-established pasture in foreground and bluegrass behind cattle. Lower photo shows the same re-established pasture in August, 1962, after ten years of hay and pasture use. Note good alfalfa-bromegrass in foreground but unproductive bluegrass in background.

prescribes specific recommendations dependent upon soil tests.

Kill Existing Sod – Establishment of new legume and grass species requires the destruction or subduing of existing grasses and weeds, especially quackgrass. The following suggestions are for seedings to be made between July 25-August 15.

1. **On bluegrass-quackgrass sods** – Pasture heavily until June 1 if the grass is mostly quackgrass; pasturing can continue until June 15 if the primary species is bluegrass since it is easier to kill than is quackgrass. Plow or field cultivate and then disk or field cultivate weekly until seeding time. Tillage is especially effective during dry periods. Figure 2 shows the beginning of tillage with a disk or a plow in northern Michigan.

2. **On sods with heavy quackgrass (most pastures will not need this treatment)** – Pasture heavily until May 15. (Fertilization in early spring with 50 pounds nitrogen per acre will double yields and weaken the grass for subsequent control). Allow quackgrass to recover to a height of 3 to 4 inches and then apply dalapon (dowpon at 12 pounds powder per acre) in at least 25 gallons of water by June 5. Starting 10 to 14 days after dalapon application, plow and then till with a field cultivator or heavy disk harrow every 10 days until seeding time.

Note – Where broad-leaved perennial weeds such as Canada thistle are present, apply one pound acid equivalent of 2,4-D ester in early June prior to tillage under either condition 1 or 2 above.



Figure 2. Initial operation in killing grasses can be disking, plowing or field cultivation starting in early June. Subsequent diskings or cultivations should be WEEKLY to kill the grass.



Figure 3. Seeding in early August should be with a band seeder followed by a cultipacker or press wheels to provide compaction for quick emergence and establishment of legume-grass mixture.

Species and Varieties to Use

For well-drained soils — A mixture of Vernal alfalfa at 8 pounds and smooth bromegrass at 3 to 4 pounds per acre is first choice. Since long term stands are desirable, Vernal is best because of a high degree of winterhardiness, high wilt resistance and a high yield of nutritious forage. Southern types of smooth bromegrass are preferable to Canadian types because of higher yields, fewer leaf diseases, and less competition to legumes. This mixture should be highly productive for 4 to 7 years if properly managed and fertilized.

For poorly-drained mineral soils (no standing water) — A mixture of Viking birdsfoot trefoil at 5 pounds and smooth bromegrass at 3 pounds per acre is recommended. Alfalfa kills out relatively soon under poor

drainage conditions. Trefoil is the only perennial legume which will tolerate both pasturing and poor drainage. Because of its reseeding habit, trefoil has lasted longer in experimental pastures than alfalfa. Bloating of animals pasturing birdsfoot trefoil has never been reported.

Seeding

Band seeding with a drill, Figure 3, followed by a cultipacker or press wheels, is the best method of making summer seedings. The seedlings are more vigorous and stands more uniform than those from broadcast seedings. With this method, the fertilizer is drilled in a band below the seed which is covered up to a ½-inch depth by the action of the drill. Com-

paction after seeding is a *MUST* for reliable germination and seedling establishment. Sandy soils should also be cultipacked before seeding to keep the seedbed from drying out.

Make seedings in late July or early August — the earlier the better. Each week's delay in seeding between August 1 and 31 results in $\frac{1}{3}$ ton less forage the next year. Seedings should not be made after mid-August in northern Michigan or after August 20 in southern Michigan. Figure 4 shows the advantage of band over broadcast seedings in obtaining a good stand of alfalfa.

Do not use oats with the seeding because of competition for moisture between oats and seeding. Bromegrass can be mixed with the fertilizer in the drill. For example, if you use 400 pounds of fertilizer and 4 pounds of bromegrass per acre, put 50 pounds of fertilizer into the drill and spread $\frac{1}{2}$ pound of bromegrass (amount in a one-pound coffee can) over it and stir. Add more fertilizer and bromegrass until the drill is filled. Do not drill the bromegrass-fertilizer mixture deeper than $\frac{1}{2}$ to one inch. Cultipacking or press wheels provide sufficient seed coverage for good germination.

Cost of Renovation

The cost of renovation is about \$40.00 per acre (up to \$50.00 if herbicides are used) including lime, tillage, fertilizer, labor, and seed. Increased production during the first 1 to 1½ years will generally pay renovation costs. The remaining 3 to 6 years will provide improved pasture or greenchopping for summer feed or hay, silage or haylage for winter feeding.

Management After Re-establishment

After the first harvest year, fields should be top-dressed annually in the fall or early spring with phosphorus and/or potassium. Soil tests made before seeding are the best guides for supplementary fertilization. Annual topdressing with a minimum of



Figure 4. Band seeding followed by compaction resulted in much better stands from early August seedings than when seed was broadcast and the soil cultipacked.

400 pounds of 0-10-30 per acre is generally necessary for continued high forage production and life of the stand on soils low in phosphorus. On soils testing medium to high in phosphorus, the cost of topdressing can be reduced by using 250 pounds per acre of 0-0-60 in alternate years.

Rotational grazing or greenchopping result in better utilization and longer life for legumes than continuous grazing. Use of a 3-cut system for hay in southern Michigan will result in longer-lived stands and higher production. Under any system, pastures or hay fields should be rested for a 6-week period starting about 4 weeks before the first killing frost. The rest period is usually between September 1 and October 15 south of the Bay City-Muskegon line and August 20 to October 10 north of this line. These dates are approximate, but the last date of the rest period is based on the date when a killing frost generally occurs. Observance of this rest period is essential to long-lived, productive stands.