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Re-establishment of Pastures and Hay Fields  
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# Re-establishment of Pastures and Hay Fields in One Year

COOPERATIVE EXTENSION SERVICE  
MICHIGAN STATE UNIVERSITY



Successful establishment provides 4-8 years of alfalfa-brome-grass instead of unproductive bluegrass or quackgrass.

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Highly productive and nutritious forage can be established in one season to replace unproductive grasses such as bluegrass (Junegrass) (*Poa pratensis*) or quackgrass (*Agropyron repens*) in old pastures and hayfields. Alfalfa-brome-grass, 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 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-brome-grass 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 tillage to eliminate or 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 this 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 550, "Fertilizer Recommendations for Michigan Crops," prescribes specific recommendations dependent upon soil tests.



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

**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.

On bluegrass-quackgrass sods, pasture heavily until June 1 if the grass is mostly quackgrass. Pasturing can continue until June 15-25 if the primary species is bluegrass since it is easier to kill than quackgrass. Plow or field cultivate starting in early June on quackgrass, a week or two later for bluegrass 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.

**Note**—Where broad-leaved perennial weeds such

as Canada thistle are present, apply one pound acid equivalent of 2,4-D ester at least 10 days prior to tillage.

### Species and Varieties to Use

**For well-drained soils**—A mixture of alfalfa at 10 to 12 pounds and smooth bromegrass at 3 to 4 pounds per acre is first choice because of good acceptability at all growth stages, high palatability, high yields and longevity. Orchardgrass at 3 to 4 pounds per acre can be used instead of bromegrass but more careful management will be needed in grazing or harvesting the first cutting on time to lessen loss of palatability or acceptability due to early heading of orchardgrass.

Since long-term stands are desirable for renovated



Figure 2. Initial operation in killing grasses can be disking, plowing or field cultivating 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.



pastures or hayfields, use an alfalfa variety which is winterhardy, wilt resistant and produces a high yield. Vernal and Iroquois are typical North American types which have performed well in pasture and hay trials. Some other long-lived, wilt-resistant varieties are equally as good. They are listed in the annual alfalfa recommendations test information from M.S.U.

The alfalfa-grass mixture should be productive for 4 to 8 years, possibly longer if properly managed and fertilized.

*For poorly-drained mineral soils*—A mixture of 6 pounds of birdsfoot trefoil and 3 to 4 pounds of smooth bromegrass, or late-maturing orchardgrass or timothy, is recommended. Recommended varieties of birdsfoot trefoil are Viking, Carrol or Empire. Alfalfa kills out relatively soon under poor drainage condi-

tions. 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 1/2-inch depth by the action of the drill. Compaction after seeding is a *MUST* for reliable germina-

tion and seedling establishment. Sandy soils and/or loose seedbeds should also be cultipacked before seeding to keep the seedbed from drying out and to prevent excessively deep seeding.

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 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 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 1/2 to one inch. Cultipacking or press wheels provide sufficient seed coverage for good germination.

Normally, fall frosts will kill annual broadleaved weeds. If annual broadleaved weeds are severe, however, 2,4D-B at one pound acid equivalent (AE) per acre, applied when the legume is 1 to 3 inches tall, will reduce or nearly eliminate annual broadleaved weed competition. Downy brome and common chickweed are not controlled by 2,4D-B but can be controlled by an early November application of Kerb at 3/4 to 1 pound AE per acre.

### Cost of Renovation

The cost of renovation is about \$50.00 to 60.00 per acre 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 green-chopping for summer feed or hay, silage or haylage for winter feeding.



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.

### 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 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 or a 2-cut system in northern Michigan will result in longer-lived stands and higher production.

If the legume starts to flower, it can be cut or grazed rotationally in September without appreciable injury. Care should be taken not to graze the alfalfa-grass mixture continuously in September since the legume must have time to replenish root food reserves for good winter survival.

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