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Interseeding and No-till Pasture Renovation

Interseeding and no-till pasture renovation offer opportunities for improving pasture productivity. Production of low yielding pastures can be doubled or tripled with the introduction of more productive grass or legume species.

Interseeding is the introduction of a legume or a more productive grass into an existing pasture sod. Contact herbicides sometimes are used to temporarily reduce competition from plants present in the stand, and for more rapid establishment of the new seedlings.

No-till pasture renovation refers to complete killing of the existing sod with a systemic herbicide, followed by the introduction of a more productive forage legume, grass, or grass-legume mixture.

With these renovation methods, soil erosion can be minimized on sloping sites by maintaining the old sod, living or dead.

Legumes interseeded into grass sod should increase pasture yield, improve forage quality, and eliminate or minimize need for nitrogen fertilizer. Thin, unthrifty grass sod might best be improved by interseeding a grass-legume mixture. Where a total change in the pasture species is desired, no-till pasture renovation can be considered. Complete renovation by thorough tillage and seeding of a mixture of grasses and legumes is a more conventional pasture renovation method (see Pm-1008, *Steps to Establish and Maintain Legume-Grass Pastures*).

Either interseeding or no-till pasture renovation can be accomplished with few field operations. Opening of the grass sod, shallow seed placement, and seed coverage are required. Drills that are designed to accomplish this are marketed by a number of manufacturers.

Some of these drills may have improved features related to sod penetration, depth control, seed metering, or coverage that improves their effectiveness in sod seeding situations. Equipment limitations for sod seeding implements sometimes are overcome by operator experience and home-shop modifications.

Steps to Follow for Interseeding

A number of precise management practices are necessary for successful pasture interseeding.

1. Site Selection

Interseeding is most effective in low-production Kentucky bluegrass sod. Smooth brome grass and other tall grasses, unless very thin, are especially competitive and make legume establishment somewhat more difficult. Alfalfa and red clover are best for interseeding into tall grass sods.

2. Soil Testing

Take soil samples to determine lime, phosphorus, and potassium needs. Soil samples can be sent to the Soil Testing Laboratory, Iowa State University, Ames, Iowa 50011, or another certified commercial soil testing laboratory.

3. Lime and Fertilizer Application

A soil pH of at least 6.5 is recommended for grass, clovers, and birdsfoot trefoil. A soil pH of 6.8 to 7.0 is recommended for alfalfa. On moderately acidic soil (pH 6.0 to 6.5), lime topdressed just ahead of seeding is not as effective as when applied the year before seeding.

Adequate phosphorus and potassium are important for rapid establishment and production. Optimum to high soil test levels are desirable. Corrective amounts of fertilizer can be topdressed ahead of interseeding or applied with some sod seeding drills. Nitrogen applications are not recommended the previous fall

or the spring before legume or legume-grass seedlings.

4. Close Grazing

Graze or clip closely before seeding to reduce vegetative growth. This makes seeding easier and reduces early competition for very small seedlings.

5. 2,4-D Application

Weeds can be a serious problem when interseeding in established grass. If allowed to remain, weeds are stimulated by fertilization and compete with the seeding. Once legumes are established, weeds are more difficult to control since 2,4-D also will suppress or kill legumes.

For spring renovation, control broadleaf weeds by spraying during the preceding year. Apply 2,4-D at 1 pound active ingredient per acre in late May or early June. If additional broadleaf weed control is needed, apply 2,4-D again in September or October. Follow label instructions when using herbicides.

6. Controlling Competition from Existing Plants

Failure to obtain stands frequently results from insufficient control of plant growth in the existing pasture sod. Interseeding as early in the spring as possible is desirable but competition from the existing pasture plants will increase during the spring months and must be reduced by clipping or grazing. The use of a nonselective contact herbicide is a valuable tool in helping to minimize competition. A few inches of grass growth are necessary for herbicide effectiveness so herbicide spraying and interseeding must be delayed.

Satisfactory stands have been obtained from seedings made up to June 1. These later seedings usually are more vulnerable to high temperature and drought stress. Late summer seedings made from mid-August to early September also may be successful. The use of a contact herbicide for late summer interseedings may not be necessary if the pasture has been grazed closely all summer.

A **contact herbicide** for **spring** seedings can be applied a few days before seeding, at the time of seeding, but no later than three days after seeding. The herbicide Gramoxone Extra is labeled for grass suppression in interseedings. It contains the active ingredient "paraquat." Apply Gramoxone Extra according to label rates. Use a wetting agent as indicated on the label and use enough pressure to

thoroughly cover the foliage. Follow safety precautions stated on the herbicide label. Small annual broadleaf and grassy weeds may be killed, but biennial and perennial weeds will not be killed. Perennial pasture grasses usually will be suppressed for three to four weeks.

7. Seeding Rates and Mixtures

Seed legumes alone where stands of desirable grass species are fair to good. Once legumes are established, the grass will thicken and improve in vigor, particularly the sod-forming grasses, such as smooth brome grass, reed canarygrass, and Kentucky bluegrass.

Sometimes legume mixtures are advantageous, but usually a single species is easier to establish and manage. An example of a legume mixture would be a small amount of red clover included with birdsfoot trefoil to increase seeding-year and first production year yields while trefoil stands are becoming well established and productive. Inoculate seed of all legumes with the proper inoculant before seeding.

Try to match the right legume with the proper grass. For example, birdsfoot trefoil is easier to establish in Kentucky bluegrass and orchardgrass than in smooth brome grass, tall fescue, or reed canarygrass. Alfalfa and red clover are more vigorous and easier to establish in brome grass, tall fescue, and reed canarygrass. A grass-legume mixture may be best where the present grass stand is thin, where a more desirable grass species is needed, or where a change in the proportion of grass species is desired.

Seeding rates suggested in table 1 are minimum for interseeding. The intent of interseeding is to establish only a partial new stand while maintaining the existing sod. The grass and legume mixtures listed are suitable for most soil conditions and producer needs. Alfalfa and sweetclover will establish and persist best on well-drained sites. Sweetclover is less satisfactory than alfalfa because of its lower quality and biennial growth characteristic.

8. Seeding with a Drill

When seeding with a drill, be sure it is designed to operate in sod. Calibrate the drill to ensure proper seeding rate. Check the depth of seed placement regularly during operation. Soil moisture and sod characteristics may change during the seeding period or for different locations in the pasture. Seed placement should be as shallow as possible and

never deeper than 3/4-inch. Soil should be firmed over the seed.

9. Managing the New Seeding

A producer must be patient and use management practices that will help the new forage seedings become established.

Gramoxone Extra turns the existing grass brown and restricts growth for three to four weeks. The suppression herbicide label restricts grazing until forage seedlings are 3 to 5 inches tall. Thus, there is not much grazing for five to six weeks or longer after seeding.

After the grass starts growing and where sod-suppression herbicides were not used, rotational grazing can be used to control competition from the sod. Avoid close grazing of newly emerged seedlings. Frequently, broadleaf and annual grassy weeds will emerge in fields treated either with sod-suppressing or sod-killing herbicides. Some mowing may be necessary to help control these grass and broadleaf weeds. Do not graze or clip warm-season, native prairie grass seedlings during the establishment year. If weeds become troublesome, clip to an 8- to 10-inch stubble height.

10. Field Observation After Seeding

Observe the new seeding periodically to note progress and to make changes relative to grazing, clipping, or other practices that will aid successful establishment. The following schedule is suggested for spring seedings.

- By 10 to 14 days after seeding, seedlings should be up and growing. Check for insect feeding, which can destroy a seedling in a short time at any time during the seeding year. Be prepared to treat quickly if necessary.
- At five weeks after seeding, grass should be recovering from the sod-suppression treatment and grazing should be feasible soon. Three to 5 inches of growth on newly planted seedlings are suggested before grazing.
- After a week into the first grazing period, note the effect of grazing on the newly emerged seedlings, and anticipate livestock removal to avoid close grazing. Clip seedlings if weeds are a problem or grazing was spotty. The new seedlings require adequate light for rapid growth.

Table 1. Minimum interseeding rates for legumes, grasses, and mixtures.*

Choice	Lb./acre
1. Birdsfoot trefoil	6
2. Alfalfa	8
3. Sweetclover	8
4. Birdsfoot trefoil	3
Red clover	3
5. Alfalfa	6
Red clover	3
6. Red clover	5
Orchardgrass	3
7. Birdsfoot trefoil	4
Orchardgrass	2
8. Alfalfa	6
Orchardgrass	3
9. Alfalfa	6
Brome grass	8
10. Alfalfa	6
Brome grass	6
Orchardgrass	2

*Higher seeding rates may improve the rapidity of stand development and resulting forage plant densities.

- Note progress of seedling growth throughout the summer. Clip or graze lightly every few weeks while still maintaining good leaf growth on new plants.
- September 1 starts a four to six week fall rest period.
- By early October, note fall growth. Late grazing after October 15 is possible if forage is needed and growth is sufficient. Leave 3 inches of residual forage growth going into winter. If a late summer interseeding was made, avoid grazing. Clip weeds and grass 4 to 6 inches if they are shading seedlings at this time.

Steps to Follow for No-till Renovation

No-till renovation offers a practical alternative for making major changes in a pasture's composition and productivity while minimizing soil erosion on sloping sites.

1-5. Management Steps for No-till Pasture Renovation

Site selection, soil testing, lime and fertilization needs, and weed control steps are the same as for interseeding.

6. Killing the Old Sod

The first major difference in the no-till renovation method is killing the sod. Complete elimination of sod competition is necessary for either a spring or late summer no-till renovation seeding. Roundup is a herbicide labeled for no-till pasture renovation. For Roundup to be effective on sod, 4 to 6 inches of grass growth should be present for sufficient leaf coverage. Unfortunately, this necessitates a relatively late spring seeding time. Other systemic herbicides may also be labeled for no-till pasture establishment.

Follow the Roundup label recommendations for application rate and safety precautions. Thorough leaf coverage is desirable. Avoid spraying moisture-stressed or dust-covered foliage.

Roundup is translocated and moves internally in the grass plants and eventually kills them. There is no residual soil activity with Roundup, which allows immediate seeding. Ten days to two weeks may elapse before visible signs of sod kill are evident. If time permits, delay seeding until the initial herbicide effect is noticeable to determine if spot retreatment is necessary,

Gramoxone Extra applied twice at 1 to 2 pints per acre before seeding has been sufficient to kill sod under some pasture conditions. The second application should be applied about two weeks after the first application. Seeding can be done after the last herbicide application, at the same time as the last spray operation, or no more than three days before the last spraying to avoid herbicide contact with the new emerging seedlings.

7. Seeding Rates and Mixtures

For no-till pasture renovation, work with the same rates and mixtures as for a conventional new seeding. Table 2 lists some of the forage legume, grass, or grass-legume mixture most commonly used in Iowa.

8-10. Steps Outlined for Interseeding

Seeding, managing the new seeding, and field observation after seeding are necessary to complete a successful no-till seeding establishment.

Table 2. Seeding rates recommended for no-till pasture renovation.*

Mixture	Lb./acre
1. Alfalfa	8
Bromegrass	8
2. Alfalfa	8
Bromegrass	5
Orchardgrass	3
3. Alfalfa	8
Orchardgrass	4
4. Alfalfa	6
Red clover	3
Bromegrass	8
5. Birdsfoot trefoil	6
Orchardgrass	3
6. Red clover	6
Alsike clover	3
Timothy	3
or	
Orchardgrass	3
7. Orchardgrass	10
8. Bromegrass	15
9. Tall fescue	15
10. Reed canarygrass	10
11. Sudangrass or Sorghum-sudangrass hybrids	25
12. Switchgrass	6-10(PLS)**
13. Big bluestem	10-12(PLS)**

*Higher seeding rates may improve the rapidity of stand development and resulting forage plant densities.

**PLS=pure live seed

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