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No-Tillage Forage Seeding Into Sod

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No-tillage establishment of forages has been successfully practiced on farms throughout Ohio since 1972. Initially, the concept of no-tillage forage seeding was to establish or re-establish more productive forage species or a combination of species into an existing grass pasture. Emphasis first was on renovation of thin, unproductive pastures using 2,4-D and paraquat. Soon farmer interest shifted to no-tillage seeding of higher-value meadows in rotational cropland. No-tillage forage seedings now often follow various row crops. This gains the weed and pest control normally provided by crop rotations and the higher success rates achieved by seedings that follow a grain crop compared to seedings made into sod. There is now renewed interest for no-tillage in sod because many persons want to chemically destroy endophyte-infected tall fescue stands before sod seeding to either endophyte-free tall fescue or another grass species. Generally one or more legumes are seeded with a grass in these sod seedings.

This agronomy fact sheet describes how to make no-tillage forage seedings into suppressed or killed sod. Directions for making no-tillage seedings into other kinds of crop residue are presented in Agronomy Facts AGF-005 (*No-Tillage Forage Seedings Following Small Grain Harvest*) and AGF-021 (*Spring No-Tillage Forage Seedings into Grain Crop Residues*). Both OSU research and farmer experience have shown that red clover is the most dependable legume to sod seed, but alfalfa and birdsfoot trefoil (where adopted) can also be seeded alone or with a companion forage grass. Perennial forage grasses could also be seeded alone. Summer annuals, small grains and brassicas for forage also can be successfully no-tillage planted.

Advantages of no-tillage forage seedings include reduced soil erosion, conservation of soil moisture, seeding into an already firm seedbed, and reduced fuel and labor requirements. The proper use of herbicides and no-tillage drills have made no-tillage a reality, but success is largely dependent upon following these precise management practices:

1. Field Selection

Drainage - productive forage species require adequate drainage. The better drained the soil, the greater the potential for success from renovation.

Soil - no-tillage seedings are most successful on silt loam soils. This technique is usually less effective on clay soils.

2. Determine Soil Nutrient Levels - Soil Test

A soil analysis of a representative soil sample is the only method by which existing soil nutrient levels and fertilization recommendations can be determined. Soil pH, lime requirement and existing levels of phosphorus and potassium are determined by analyzing the soil. Soil for analysis may be submitted to the REAL Testing Laboratory, through County Cooperative Extension Service offices.

3. Apply Lime And Fertilizer

The key to the successful establishment and maintenance of productive forages is adequate fertilization. Producers should not attempt to improve forages by reseeding unless willing to apply needed fertilizer. With pastures, the limestone will not be mechanically mixed into the soil; therefore, apply lime at least six months before seeding to produce a pH change in the rooting zone. When renovating pastures the phosphorus and potassium also must be surface applied. These should be spread before seeding. In cropland rotation fields lime and nutrient incorporation may be possible through some plowing or other types of tillage. Attempts to no-till alfalfa are rarely successful where soil pH, phosphorus or potassium soil test values are below recommended levels **EVEN IF CORRECTIVE APPLICATION OF THESE NUTRIENTS ARE SURFACE SPREAD OR EVEN PARTLY INCORPORATED PRIOR TO SOD SEEDING.** Attempts to "thicken up" declining stands of alfalfa by no-tillage have seldom been successful and this practice is not recommended.

4. Herbicide Options

For suppression of existing grasses and undesirable emerged broadleaf weeds prior to or at time of seeding:

Broadcast 13-24 fluid ounces Gramoxone Extra in at least 20 gallons/acre plus 1 pt/100 gallons water of non-ionic surfactant to grass grazed or mowed to approximately 3" or less height.

A. Use 13+ oz/A rate + surfactant when treating Canadian or Kentucky bluegrass, timothy and other poor to moderately competitive annual or perennial grasses and associated broadleaf weeds.

B. Use rates of 24 oz/A or less + surfactant when spraying vigorous or coarse sod species such as bromegrass.

C. To further enhance suppression and control of vigorous growing sod grasses use two split applications of 13 to 24 oz/A - 10 to 21 days apart, but do not exceed 3 pt/A Gramoxone Extra in preparation for a reseeding.

D. Current interpretation of 2,4-D labels do not allow applications within 90 days of a forage seeding. If broadleaf weeds are anticipated to be severe, prepare sites beforehand by applying 2,4-D, Banvel or Crossbow, according to label, or use Roundup.

Where sod-seeding into tall fescue, orchardgrass or other competitive grass species, or where moderate to heavy infestations of perennial broadleaf weeds also exist...

Broadcast Roundup at 1-3 qt/A on forage stands that are 6-8 inches tall. Roundup applications to sod have proven particularly useful when unwanted grasses are present that need to be replaced. An example might be to kill endophyte-infected tall fescue and reseed to orchardgrass, endophyte-free fescue or other grass species.

Three methods of utilizing Roundup with sod seeding are shown below. The second method has provided exceptionally complete kill of orchardgrass and tall fescue sods with 1 to 2 qt/A rates of Roundup, if coupled with this addition of 0.5% non-ionic surfactant, flat fan nozzles and use of 5-10 gallons water carrier per acre. The addition of 2% by weight (equal to 17 lb/100 gal water) of dry spray-grade ammonium sulfate may enhance Roundup performance under conditions of environmental stress.

Roundup Application Time	Seeding Interval
late June - early July	late July - August
September to November before winter dormancy	late March - early April
late April - early May	early May

5. No-Tillage Seeding In April Or August

Use a heavy, no-tillage drill with press wheels to achieve proper seed/soil contact at approximately 1/2 inch depth. Band apply a high phosphorus fertilizer, if possible, if the drill has this capability.

Forages may be seeded immediately following Gramoxone Extra usage on short grazed or mown forages. The slower action of Roundup applied to 6-8 inch forage necessitates a wait of one to two weeks or longer. Research suggests that a three or more week interval will dissipate allelopathic compounds in killed sod. The program of fall-applied Roundup and early spring forage seeding, of course, has a much longer interval and is the preferred method.

Delay seeding until soil is in proper condition to crumble and allow for closure of drill opener furrows.

Use standard seeding rates. The choice of forage varieties is the same for both conventional and no-tillage techniques.

6. Graze And/Or Mow

During the establishment year, either infrequently graze and/or mow to reduce the competition to the seeding. Practice light rotation grazing. Do not graze until forage seedlings are at least 3 inches tall. Mow weeds when necessary to prevent competition. It takes one year to establish a vigorous no-tillage seeding. The producer must be patient and use management that will help the forage seedlings to become well established.

7. Rotational Graze After Establishment

Grazing rotationally assists in maintaining a productive forage stand. No forage species will remain in a permanent pasture unless grazing management is practiced.

8. Fertilize Annually

Forages respond to fertilization. Productive forages must be fertilized to maintain the stand and to obtain their production potential. Fertilize according to production recommendations found in the *Ohio Agronomy Guide*, OCES Bul. 472.

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