

Why Frost Seed?

Frost seeding offers several advantages. It is increasingly being used by grazers as a way to improve pasture yields or change forage species composition within the pasture and keep costs down. It gives the ability to establish forage in an undisturbed sod, a reduced need for labor and energy compared to conventional seeding methods, the ability to establish forages with minimum equipment, a shortened non-grazing period, and it is a method to maintain stands at productive levels with both grasses and legumes.

As with any method of forage establishment, seed to soil contact is critical for successful frost seedings. There are several management practices that can be done to help insure good seed to soil contact. One involves fall grazing management. Pastures should be closely grazed in the fall or winter to open stands and expose soil. Sod-type grasses like bluegrass are the most difficult for successful frost seedings, especially where a thick layer of thatch covers the soil surface. It is in these situations where short duration animal hoof action is sometimes needed to help plant the seed. Another is machine harvest of existing forage to help expose soil.

New seedlings must be given a chance to establish without excessive competition from plants already present. Reducing competition can be done in several ways. First, grazing pastures down to 2 inches in the fall will help to slow regrowth in the spring. Frost-seeded pastures need to be grazed regularly in the spring and summer to allow for light penetration into the plant canopy. However, it is also beneficial to move animals off pastures before young seedlings are consumed prior to adequate root development.

In many cases, frost seedings are made to introduce or increase forage legume species into a grass stand. Research and farmer experience has shown good results with red clover and birdsfoot trefoil. Alfalfa, alsike clover, and white or ladino clover have also been frost-seeded with varying degrees of success. **Do not frost seed alfalfa in situations where alfalfa plants already exist in the stand!** Autotoxicity will prevent new seedlings from becoming established. Several studies have indicated that frost seeding both red clover and birdsfoot trefoil together offer the advantage of long-term legume presence in a pasture. Grazers sometimes find themselves in a position to try and introduce grasses into old alfalfa stands. This offers some unique challenges because most cool season grasses do not establish from frost seeding with the success of legumes. Both perennial and annual ryegrass are good choices for frost seeding where fast establishing, high quality pasture is desired. Some grass species establish more rapidly than others. The ryegrasses and orchardgrass contribute to forage yield during the seeding year. Smooth brome grass and reed canarygrass often need a full growing season before plants become productive. Broadcasting grass seed can pose some unique problems.

When mixed with legume seed, grass seed will not throw as far and result in alternating strips of grass and legume plants. For this reason, it is recommended to seed grasses separate from legumes (make two passes) when using a broadcast seeder. Grass species like smooth brome grass are often more easily established into an existing sod using a no-till drill early in the spring instead of a broadcast seeder. Where grasses are drilled into existing forage stands, mix light, large-seeded species like smooth brome grass with oats to prevent bridging and insure uniform flow through the drill.

At equal seeding rates, the number of seeds that establish into productive plants will be a lower percentage with frost seeding compared to conventional methods. However, frost seeding pastures almost always involves a resulting forage composition that will be a mixture since it is being done into some type of established sod. For this reason, even seeding only one species usually does not require rates as high as those seeded with conventional methods in a tilled seedbed where a full stand is desired. Frost seeding rates then become a function of existing sod condition, species being seeded, and the desired number of seedlings in the final stand. Optimum seeding rates for specific pasture situations sometimes need to be determined by trial and error over several years. Based on research experience, recommended guidelines for seeding into existing forage stands are presented in table below.

Recommended Seeding Rates for Frost Seeding into an Existing Grass or Legume Sod			
	<i>Rate (lb./acre)</i>		<i>Expected Established Plants*</i>
Species	Seeded Alone	As Part of Seed Mixture	Plants per square foot
Red Clover	4 - 8	3 - 4	2 - 5
Birdsfoot Trefoil	4 - 6	2 - 3	6 - 9 (in 2nd year)
Alfalfa	5 - 8	3 - 4	4 - 6
Ladino Clover	2 - 3	1 - 2	1 - 2
Alsike Clover	2 - 4	1 - 2	2 - 3
Perennial/Annual Ryegrass	8- 15**	2 - 3	10 - 12
Orchardgrass	3 - 4	1 - 2	4
Smooth Brome grass	12	8 - 10	1 - 2
Reed Canarygrass	Not recommended for frost seeding		
Timothy	Not recommended for frost seeding		
* Expected plants based on "alone" seeding rates			
** Use higher rate in "bare ground" situations and lower rate in existing sods			

The fundamental principle behind frost seeding is that alternating freezing and thawing, along with spring rains, will help to incorporate the broadcast seed into the soil surface. Seeding on

top of snow is acceptable if the depth is not too great. The risk of seeding on top of snow is that a rapid meltdown may result in runoff of both water and seed. Most frost seeding is performed during March.

Be certain to inoculate legume seeds prior to seeding. Bacterial inoculant is specific for each legume species. For example, alfalfa inoculant is not effective on red clover.

There are many excellent tools for making broadcast frost seedings. These include seeders that mount onto ATV's and tractor 3-point hitch mounted seeders. Conventional roller and grain drill seeders can also be used but will require more trips across pastures. When using spinner-type seeders, be sure to determine the effective seeding width for each seed type or mixture. This will vary between species.

Frost seeding can be an effective, low-cost method to introduce new forage species into an existing sod or maintain the current forage composition of pastures. Check into frost seeding and see if it will work for you.