



## **Frost Seeding: A Cheap Alternative to Improve Hay and Pasture Land**

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Frost seeding is a popular option to improve forage yield and quality. The principle of frost seeding is to broadcast forage seed in the early spring when the ground freezes at night and thaws during the day. The main advantage to frost seeding is the ability to establish desirable species into an undisturbed sod at a low cost per acre. A 60 – 70% frost seeding establishment rate has been reported by many farmers. You can increase the success of frost seeding establishment by following these key steps.

### **Remove vegetation before seeding**

Seed to soil contact is critical to the success of frost seeding. The best candidate for frost seeding is the “run out” field. If you walk across a field and see bare soil these areas are ideal for frost seeding. Closely grazing or mowing pastures in the fall will also help expose the soil. Generally, fields with a thick thatch layer will not frost seed well because the seed will not have contact with the soil.

### **Seed in the early spring**

The optimum is to seed early in the spring after the snow is gone but while the ground is still frozen. The repeated freezing and thawing will cause some of the seed to fall into soil cracks and germinate. Frost seeding can be done over a thin layer of snow. However be aware that rapid snow melt can cause the seed to be washed off the pasture. Frost seeding can also be done in December once growth has stopped for the year and before snowfall. This time works well in areas that receive good snow cover and do not experience prolonged winter thaws. Frost seeding does not work on sandy soils where there is no swelling and shrinking associated with the freeze-thaw cycle.

Frost seeding is often done with seeders mounted on ATVs, or a tractor mounted or hand held broadcast seeder. When frost seeding with a broadcast seeder, make sure to first determine the effective seeding width to avoid possible overlap of seed. Although not always necessary a disk or cattle can help incorporate the seed into the soil. A no-till drill can be used but this will increase the number of trips across the field.

### **Select species that can germinate when cold**

Frost seeding works best with legumes and grasses that germinate fast and at cool temperatures. Recommended species and seeding rates are shown in Table 1. Red and white clovers are the most effective in establishment. Birdsfoot trefoil is less successful due to slow establishment. Alfalfa does not frost seed well because its germination is variable at cool temperatures. There are several benefits to adding legumes to the pastures including higher quality forage as well as nitrogen to support grass growth. Although legumes are the most successful for this system, some grasses can be successfully frost seeded. Of the grasses, perennial ryegrass and orchardgrass frost seed with the greatest success (20-30% establishment), brome grass with intermediate success while reed canary and timothy have the least success. Typically, ryegrasses will not over winter in most areas of Vermont. Therefore, in most cases, ryegrasses should be seeded with the intent of filling single season forage needs. Ryegrass and

orchardgrass will contribute to forage yields in the seeding year while brome grass will need a full season before plants become productive. Since grass seed is light it will not throw as far as the heavier legume seeds when broadcasted. If seeded as a mixture, this difference in seed weight will result in alternating strips of grass and legume plants. Therefore seeding the species separately will result in a more even distribution of grasses and legumes. To spread the risk of frost seeding it is generally better to seed at the lower rates and repeat in successive years than to seed at higher rates in any one-year. Many people will frost seed 25% of their acreage each year so that they are spreading their risk over different years.

**Table 1. Recommended species and seeding rates for frost seeding.**

|                    | <b>Seeding rate (lb/acre)</b> |
|--------------------|-------------------------------|
| Red clover         | 2 - 4                         |
| White clover       | 2 - 4                         |
| Birdsfoot trefoil  | 4                             |
| Perennial ryegrass | 2 - 3                         |
| Orchardgrass       | 2 - 4                         |
| Smooth Brome grass | 8 - 10                        |
| Timothy            | Not recommended               |
| Reed Canarygrass   | Not recommended               |

Frost seeding can be an effective and inexpensive method to improve the quality and quantity of forage. The important key steps to success include good seed to soil contact, seeding early, proper species selection, and remove competition from seedlings. Periodic frost seeding will help maintain high quality forages.