



Optimum Alfalfa Seeding Rate

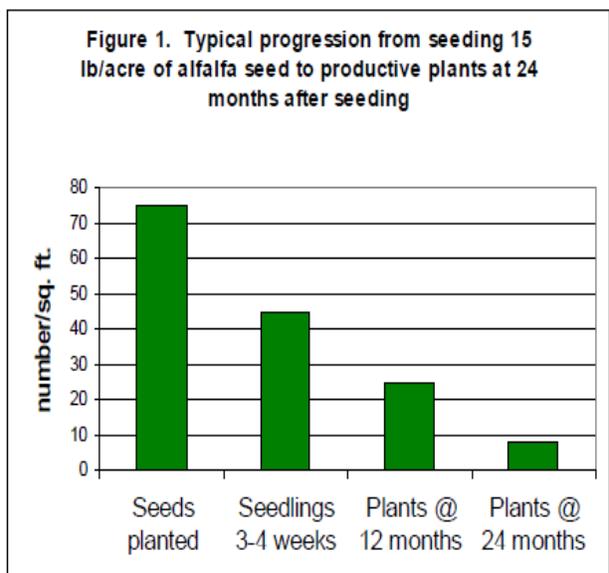
By John McGregor, MFGA Extension Support

The winter of 2016-17 was tough on the alfalfa throughout Manitoba. There are very few areas that aren't reporting winterkill damage, and in some areas the damage is extensive. Although many producers have implemented contingency plans to help make up for the forage shortfall this year, many alfalfa acres that will need to be seeded to replace the lost acres.

One of the biggest costs to replacing an alfalfa field is seed. The question always comes up as to how much seed do I need to plant to get a good stand of alfalfa that will provide decent yields for the next 3-4 years. Looking at the issue of alfalfa seeding rates, let's start at the beginning with the seed itself. There are about 199,000 alfalfa seeds per pound. If that one pound was evenly spread over one acre (43,560 ft²), there would be in the neighborhood of five seeds/sq ft. So pick your seeding rate, multiply by five, and that's how many seeds/sq ft should be sitting a fraction of an inch below the soil surface waiting to become productive plants when you are finished seeding.

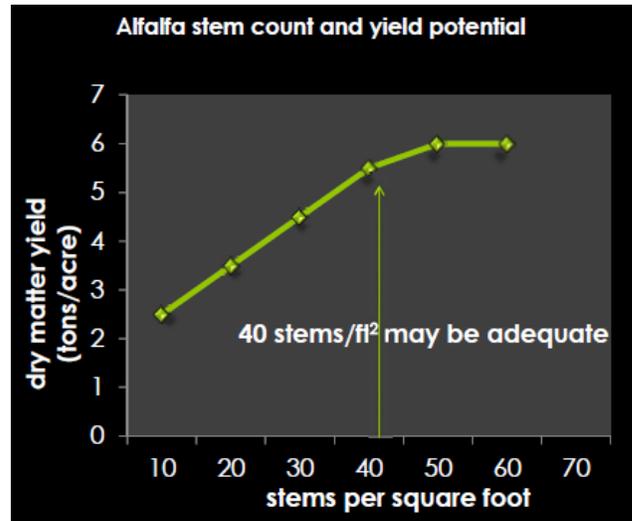
If we begin with a 15 lb/acre seeding rate we should have 75 seeds/sq ft. typically only about 50 to 70% (avg 60%) of those seeds will be accounted for as seedlings after emergence is complete in three to four weeks.

That leaves us with 45 seedlings/sq ft. As plants become bigger and compete for available resources, another 40 to 50% will be gone by the following spring. This leaves us with about 25 plants/sq ft as our stand heads into the first production year. During the next 12 months, expect another 30 to 40% loss of plants, leaving us with 8 or 9 productive plants/sq ft.



As depressing as all of this may sound in this example, stand counts for the spring following seeding and a year later are on the high end of what research suggests are fully productive stands. Generally speaking, we like to see 15 to 25 plants/sq ft at the beginning of the first production year and at least 4-5 healthy plants/sq ft in older stands. As stands age, evaluation isn't based solely on plant counts.

Generally stem number, stem size, plant health, weed restrictions are considered. Older stands should have 40-50 stems/sq ft to be considered productive. Forage yield is not just a function of the number of plants/ unit area, but also the number of stems/ plant and weight/ stem. As stands thin, plants initiate more stems and, in some cases, larger stems as a response to less plant to plant competition.



Based on what we just learned about seed survival one would think that that more seeds dropped per square foot should result in more seedlings and plants/sq ft. Seeding studies show that higher seeding rates do result in more seedlings through the end of the seeding year. Further, very low seeding rates (below 8 lbs/ acre) often have fewer seedlings and lower total-season yields in the seeding year. However, as seeding rates increase, the percentage of plants that die during the first year also increases. Some recent research showed 45% first-year plant mortality for a 10 lb/acre seeding rate and 60 to 70% mortality for seeding rates over 20 lbs/acre.

So what's the optimum alfalfa seeding rate?

Recommended seeding rates vary with region. Generally 10-12 lbs/acre is a good guideline for Manitoba. This rate can vary depending on seeding conditions, seed size and germination percentages.

There may be times where it makes good sense to increase seeding rates. These include situations where the seedbed is less than optimum and where the desired seeding depth is difficult to obtain (either too deep or too shallow). More than 90% of forage stand failures are due to these two reasons and each is preventable.

Soil must be packed around the seed to make good seed to soil contact so that the seed can take up water from the soil. The old, but good, recommendation has been that if you stand on the field and your shoe sinks more than 1/4 inch into the soil, the soil is too loose for seeding.

It is important to remember that when small seeds germinate, their first roots must come into immediate contact with moisture and nutrients in the soil if those seedlings are to survive and grow rapidly. Loose seedbeds can have up to 50% dead airspace in the seeding zone. First roots that emerge into that dead airspace often do not live, and your stand will suffer. A firm seedbed reduces this dead airspace, which helps you get thicker stands that develop more rapidly.

The second reason for stand failure is seeding too deep with a drill. Legume seed should be placed $\frac{1}{4}$ to $\frac{1}{2}$ inch deep in most soils ($\frac{3}{4}$ inch depth in sandy soils). Placing seed deeper may delay or reduce emergence and result in poor stands. A good test when seeding with a drill is to look for seeds on the soil surface after seeding. If the seed is properly placed at $\frac{1}{4}$ inch depth, some seed will end up on the soil surface. One should find 8 to 10 seeds/sq ft on the soil surface. If the number is less, you are likely placing the rest of the seed too deep.

For more information on forage establishment click on [Tips for Improving Forage Establishment Success](#)