Alfalfa Stand Establishment for High Yield

The agricultural landscape has dramatically changed recently with volatile commodity prices, increasing land prices and very uncertain planting intentions for 2014 and beyond. All the while, alfalfa hay and haylage prices have remained strong. Because of this, we are starting to see some acres come back into the forage fold. The following information is designed to help producers maximize their alfalfa yield by ensuring a fantastic stand is established this spring.

Start with Great Seed

Starting with great seed involves many factors. The first decision to be made is to ensure you are choosing a variety that is going to meet your expectations in terms of yield and quality. Your seed sales representative should be able to provide you with varietal comparisons. You can also use the following websites to look at yield information from government and university yield trials:

www.goforages.ca
http://www.uwex.edu/ces/ag/alfalfa/

University of Wisconsin trials over multiple years have shown that top yielding genetics average 0.55 tons per acre per year more than low yielding genetics. With hay prices sitting steady at around 10 cents per pound over the past three years, that equates to $121 per acre per year, or a whopping $1,247.81 per unit of alfalfa purchased assuming that you are planting 16 pounds of seed per acre and keeping the stand for three years of production. This calculation goes to show just how important variety selection is and how differences in seed price work out to be very small compared to the yield impact of the actual genetics you are buying.

Another factor to consider is to ensure the disease and agronomic package of the variety you plan on growing fits the needs of your farm. If aphanomyces has been an issue for you in the past, you will want to ensure you are growing a variety highly resistant to that particular disease. If potato leafhoppers (PLH) have plagued your fields and spraying is not something you wish to do from a management perspective, maybe a PLH resistant variety is your best option. Similarly there are lodging resistant varieties available on the market if standability has been an issue for your operation.

Planting Date

Alfalfa germinates at much lower soil temperatures than corn or soybeans, 2 ºC (35 ºF) versus 8 ºC (45 ºF) for corn or 13 º C (55º F) for soybeans. This is why we are able to plant alfalfa earlier in the spring than many other crops. Being able to plant earlier due to lower temperature requirements does not however change the fact that with all three crops we need to ensure the ground is fit from a moisture and seedbed preparation perspective prior to planting. Generally we expect spring alfalfa seeding to occur between April 1st and May 15th. This timing provides the seeds and seedlings with the least moisture stress and potential for crusting problems.

For summer seeded alfalfa, the goal is to have the crop in the ground by August 15th at the absolute latest. Alfalfa seedlings need a minimum of 6 weeks of growth prior to a killing frost (-5 ºC or 23 ºF) to grow large enough and put down enough root reserves to survive the winter and thrive in the spring.

Planting Rate

General recommendations for seeding rate range between 12 and 18 pounds of pure live seed (PLS) per acre. The key to the previous sentence was pure live seed. Seeding 15-18 pounds is a good starting point as this will generally allow 80 to 90 seeds per square foot which should translate into 45-50 seedlings within a month. Reading your seed tags prior to planting is critical to ensuring you are planting at the correct rate. Seed coating and percent total germination are the most important factors to be aware of as you calculate how many pounds of actual seed to plant to achieve your desired seeding rate in PLS. Some companies use a 34% limestone or clay coating on their seed, meaning that you are already down to only 67% of the weight of your seed being PLS before you multiply that number by percent total germination. If for example we say that percent total germination is 90%, then we end up with only 60% of the actual weight we will be planting as PLS. To achieve 15 pounds of PLS per acre at planting, our actual planting rate would have to be 25 pounds per acre.

Effect of Seed Coating on Actual Seeding Rates

SEEDING RATE LBS/A	SEEDS/FT² 9% LIGHT-COAT	SEEDS FT² 33% HEAVY-COAT
24	125	91
21	110	79*
18	94	68
15	78*	57
12	63	45

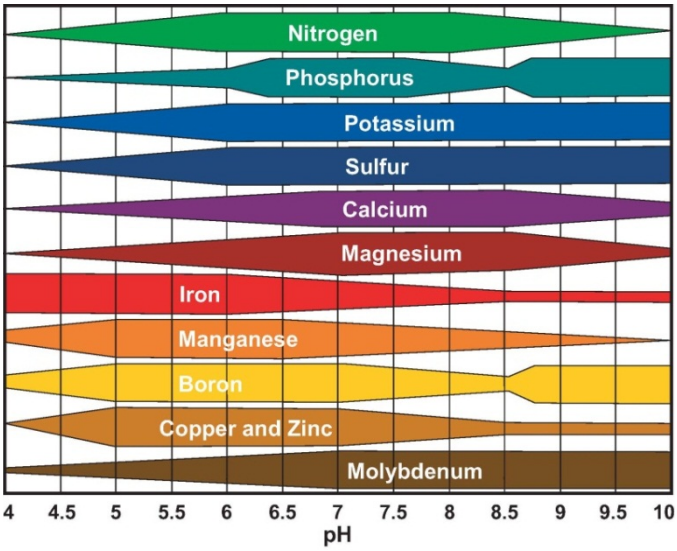
Effect of Seed Coating on Alfalfa Seeding Cost Per Acre

SEEDS/FT²	9% COAT SEEDING RATE NEEDED, LBS/A	33% COAT SEEDING RATE NEEDED, LBS/A	9% COAT SEED COST/A @ $225/UNIT*	33% COAT SEED COST/A@ $190/UNIT
94	18	24.8	$81	$94
78	15	20.7	$68	$79
63	12	16.5	$54	$63

*Cost per unit can vary depending on variety and qualified discounts.

Field Preparation

The first step to field preparation is to ensure that soil tests have been taken to determine fertility needs. This is important not only from a fertility stand point, but also to ensure that the pH level of the soil is in the correct range to maximize nodule development and nutrient uptake by the plant. As you can see from the figure below, a pH between 6.5 and 7 is ideal for alfalfa, allowing optimum uptake of nutrients and good rhizobium health.



Fields that will be planted to alfalfa should have a firm seedbed to improve seed-to-soil contact and prevent the alfalfa seed from being planted too deep. In clay and loam soils, a planting depth between ¼ and ½ inch is perfect. On sandy soils, planting depths of ½ to 1 inch are recommended. In order to determine whether or not your seedbed is too hard, too soft, or just right, think about three legged Willy from North Dakota State University.

Footprint depression is a quick and easy method to determine if your seedbed is the correct firmness to plant. If your boot sinks in about ½ an inch, or just the sole goes into the ground, conditions are just right for planting.

Nurse or Companion Crops

It seems strange that we would never consider planting our corn or soybeans with a nurse or companion crop, and yet with alfalfa this is a common practice. The primary reason to seed alfalfa with a nurse crop is for erosion control during early stand establishment. Prior to the availability of herbicides, nurse crops were used as competition for weeds. Also, nurse crops can provide additional forage tonnage in the seeding year, although at the expense of alfalfa yield. For establishment of a productive alfalfa stand, this would no longer be considered a best practice. Research performed in Ontario has shown that nurse crops are in fact seen as highly competitive weeds by the alfalfa and will significantly reduce alfalfa yield over the life of the stand.

Conclusions

Following the above recommendations will have you well on your way to growing a productive alfalfa stand that exhibits the yield and longevity you desire. If management and fertility are looked after over the life of the stand, you should be rotating a great, productive stand of alfalfa into corn and capturing the nitrogen and soil health benefits that it can provide.