Alfalfa Seed Coatings & Treatments: Using Technology to Establish More Healthy Plants Per Acre

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The seed industry has seen an exponential increase in the use of seed treatments over the past three to five years. Almost 100% of seed corn and a growing percentage of soybeans and sorghum are now treated with Cruiser or other seed-based insecticides. A wide range of other products, from micro-nutrients to biological treatments to unique naturally occurring molecules, are being tested on and/or applied to a wide range of new crops, including alfalfa seed.

Alfalfa growers have been successfully utilizing seed treatments and seed coatings for many years. Virtually all alfalfa seed is pre-treated with specially selected strains of Rhizobium to enhance the development of N-fixing nodules on plant roots that are required for the plant to produce its own N required for plant growth. Dormal and Nitrogen Gold are the two most widely used brands of alfalfa inoculant.

Another important seed enhancement used on virtually all premium alfalfa seed is Apron XL (Metalaxyl-M). This proprietary systemic fungicide from Syngenta was developed to protect new seedlings from damping-off, seed rot diseases like early season Phytophthora root rot, systemic downy mildew, and Pythium. When seedlings are still small, genetic resistances are not yet activated; when these diseases are present, death loss can be up to 100%. The combination of effective control in reducing alfalfa stand establishment losses and economical cost have made Apron XL an industry standard that growers demand in virtually all areas of the United States.

Seed coatings are another widely accepted, but sometimes misunderstood, technology used to increase the success of establishing healthy, productive alfalfa stands. Today's functional coatings have come a long way from the lime coated seed of four decades ago. Today's coatings are carefully formulated mixes of minerals, micro nutrients and special compounds that provide an ideal microenvironment for the seed that can speed both the rate and extent of germination and nodulation. Most major alfalfa brands sell a high percentage of coated alfalfa seed in the U.S. and an even higher percentage in key non-dormant international markets like Mexico, Argentina, and the Middle East. Even a major brand that advertises against coated seed in the U.S. uses it internationally and in some domestic markets. At NK Seeds, over 85% of Genoa and premium alfalfa sales are for coated seed based on grower demand, which is the result of continued positive results over the past two decades.

The most important benefit of modern seed coatings is healthier, more productive alfalfa plants. A good analogy is to compare the use of coated seed to that of raising healthy Holstein heifer calves. A dairy heifer that starts out weak and sickly when it is small usually never reaches its full genetic potential compared to a calf that is strong and healthy from birth. Similarly, coated seed helps develop alfalfa seedlings that start fast, strong and healthy so they turn into highly productive plants and reach their full genetic potential. Even though there are up to ⅓ fewer actual seeds/lb. with coated seed, the seedling survival rate of these can be up to 100% higher. This results in more healthy plants/ac – which is what to look for. More healthy plants mean thicker, more productive stands with high yield potential.

Seed coatings of the future will continue to be carriers for new and improved combinations of seed treatments, insecticides, fungicides, micro nutrients, plant growth regulators and a host of other biological and naturally accruing compounds. Some of these new technologies are already being utilized in today's coatings.

For example, Syngenta Seeds is now including Optimize Gold LCO technology as part of the seed coating to even further enhance nodulation and stress tolerance for healthier, more productive plants. Other companies are adding things like zinc, molybdenum and/or gypsum to their seed coatings. New coatings have been developed specifically for use on high pH soils and Summit Seed Coatings has developed a new coating that can be approved for use by organic alfalfa growers. New super absorbent starches and polymers are being tested and used to increase the water holding capacity of the seed and the germination zone to improve germination and seedling survival in more arid environments.

Table 1. *2006 Spring seeding performance data - coated vs. uncoated**

Location 1			Location 2		
	Apron XL w/o Coating	Apron XL w/Coating		Apron XL w/o Coating	Apron XL w/Coating
Plants/ft²	55.3	63.8	Plants/ft²	55.3	63.8
1st Cutting	2.0	2.2	1st Cutting	2.0	2.2
2nd Cutting	1.8	1.0	2nd Cutting	1.8	1.0
3rd Cutting	1.2	1.3	3rd Cutting	1.2	1.3
2006 Totals	5.0	4.5	2006 Totals	5.0	4.5

**Replicated large-plot spring seeded in 2006 and conducted by Agri-Tech Consulting at two locations near Whitewater, WI (yield data from 2006 harvest).*

Table 2. *2006-2007 Fall seeding performance data - coated vs. uncoated**

Location 1			Location 2		
	Apron XL w/o Coating	Apron XL w/Coating		Apron XL w/o Coating	Apron XL w/Coating
Plants/ft²	49.5	55.8	Plants/ft²	49.0	60.5
1st Cutting	1.30	1.64	1st Cutting	1.28	1.58
2nd Cutting	0.85	1.21	2nd Cutting	0.93	1.35
3rd Cutting	1.03	1.30	3rd Cutting	1.08	1.41
4th Cutting	1.23	1.43	4th Cutting	1.23	1.43
2007 Totals	4.41	5.58	2006 Totals	4.52	5.77

**Replicated trial fall seeded in 2006 and conducted by Agri-Tech Consulting at two locations near Whitewater, WI (yield data from 2007 harvest).*

In summary, alfalfa seed coatings and seed treatments are must-have management tools for a high percentage of top alfalfa growers around the world. As with any technology, producers should keep an open mind, do research and talk to other alfalfa growers to find the right product for their farming operation and geography. The combination of these new and existing technologies with future biotech seed traits have the potential to revolutionize alfalfa production (and increase profit potential) just like they have in corn and soybean production.