A Summary of Alfalfa Research Data with Magnet®

Summary

Recently two alfalfa trials were completed in two (2) of the world's top–producing alfalfa–growing areas: South Dakota and California. Both of the trials included a foliar application consisting of ammonium sulfate as a buffer, an insecticide, and a pint per acre of Magnet. Both trials showed a statistically–significant increase in protein (31.2% and 7.7% respectively) and in total yield per acre—resulting in a positive return on investment when factoring in the cost of material. The following is a discussion about why this occurred, and how alfalfa growers could implement Magnet to increase yields on their own respective farms.

More Trial Details

Even though the trials were separated geographically, they both had some interesting similarities. Each farm's alfalfa was in its 3rd season, and each alfalfa field had at least one cut for the season already. The farm in Dakota was treated two (2) weeks before the next cut, while the farm in California was treated one (1) week before the next cut. Both farms had adequate nutrition in the soil along with good soil drainage. Neither one of the farms had any disease pressures of note. In other words, both farms were operating from a near–optimal situation in regard to soil and plant health, without any statistical outliers in regard to weather. Conditions were noted in South Dakota to be cool and relatively dry (although not overly dry) leading up to the application of Magnet.

Both fields used 0.6 lbs of ammonium sulfate per 10 gallons of solution per acre along with 16 ounces (1 pint) of Magnet. The ammonium sulfate was used as a buffer—ostensibly to adsorb any calcium or magnesium that might be in the water to prevent it from interacting with the pesticide. The California trial differed from the South Dakota in that it did not include ammonium sulfate in the control treatment. Instead, the California trial included a surfactant in both treatments. Finally, both trials also included a broad–spectrum pyrethroid for both treatments.

	South Dakota Trial	California Trial
Treatment 1 (Control)	10 gallons water 0.6 lbs ammonium sulfate Pyrethroid insecticide	10 gallons water 32 oz spreader surfactant Pyrethroid insecticide
Treatment 2 (Magnet)	10 gallons water 0.6 lbs ammonium sulfate 16 oz Magnet Pyrethroid insecticide	10 gallons water 0.6 lbs ammonium sulfate 16 oz Magnet Pyrethroid insecticide 32 oz spreader sufactant

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Alfalfa Stressors and Magnet

Alfalfa, much like any other crop, is suspectable to a variety of pests, which is likely why in–season pyrethroid applications are popular. Anything from caterpillars (alfalfa caterpillar, green cloverworm) to beetles (blister beetles) to weevils (alfalfa and clover leaf weevil), and everything in between (aphids, potato leafhopper, and plant bugs) can negatively affect the yield and protein content from one cut to another. Maximizing the effectiveness of the pesticide application can help maximize yields at harvest. Due to it's anionic polymeric structure, Magnet can adsorb calcium, magnesium, and other micronutrients that might be in the spray–tank water—reducing their interaction with the pesticide along with ammonium sulfate. In addition to this, Magnet also has the ability to function as a humectant whereby it can attract and retain moisture. This humectant property could help increase the longevity of the pesticide application. Both treatments were made in hot, clear conditions. It's possible that the foliar application of Magnet decreased the stress on the alfalfa by acting as a film–forming polymer that in a way acts like an additional cuticle for the plant. Regardless of the mode of action, Magnet significantly increased the protein content and overall yields in both locations.

Summary of Yield Data

South Dakota measured their yields by protein content and total yield per acre. California measured their yields by protein content and total milk lbs per acre—converting their yield into milk lbs. Both locations—with their respective increases—support the idea of using Magnet along with any pesticide treatments. Even when conditions were optimal in regard to weather and soil, adding Magnet with the pesticide yielded a large return for the growers in both locations.

	Protein (%)		Lbs per Acre		Milk Lbs per Acre	
	Untreated	Treated	Untreated	Treated	Untreated	Treated
South Dakota	23.7%	31.1%	9060.4 lbs	9931.6 lbs	n/a	n/a
	31.2% Increase		*871.2 lbs Increase*		---	
California	20.65%	22.14%	n/a	n/a	4746.0 lbs	5011.0 lbs
	7.2% Increase		---		*265.0 lbs Increase*	

South Dakota Trial

Treatment 1 (Control)

	Level Found	
	Dry Weight	Units
Protein (crude)	24.2	%
Fiber (acid detergent)	38.3	%
Fiber (neutral detergent)	52.2	%
Total digestibile nutrients	57.4	%
Net energy (lactation)	0.58	Mcal/lbs
Net energy (maint.)	0.56	Mcal/lbs
Net energy (gain)	0.33	Mcal/lbs
Relative Feed Value	105	---

Treatment 2 (Magnet)

	Level Found	
	Dry Weight	Units
Protein (crude)	32.0	%
Fiber (acid detergent)	33.3	%
Fiber (neutral detergent)	39.1	%
Total digestibile nutrients	62.8	%
Net energy (lactation)	0.64	Mcal/lbs
Net energy (maint.)	0.62	Mcal/lbs
Net energy (gain)	0.35	Mcal/lbs
Relative Feed Value	150	---