Foliar Fungicides on Alfalfa: 2012 University Extension Field Trial Results from Minnesota & Wisconsin

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To answer questions regarding the use of foliar fungicide on alfalfa, staff from Extension and USDA-ARS in Minnesota and Wisconsin conducted field research trials to examine the benefit of using a foliar fungicide, alone or in combination, with foliar insecticide on alfalfa. Initial small scale trial results conducted by this group in 2011 showed inconsistent response to the application of Headline® on alfalfa.

Headline is labeled for use on alfalfa. It is not labeled for clovers, grasses used for forage, or other perennial forage crops, so cannot be applied to mixed stands. The label also states a limit of three applications per year, with a rate of 6-9 oz/acre per application with a maximum total application of 27 oz/acre per year.

Trials were conducted at three locations in Wisconsin (Arlington, Tomah, and Waupaca) and two in Minnesota (Waseca and Rosemount). The Arlington, Waseca, and Rosemount locations were conducted on University Research Stations, Tomah and Waupaca were conducted in grower fields.

At each location, a randomized complete block experiment was used with four replicates. Treatments were: Headline (9 fl oz/acre), Headline (9 fl oz/acre) + Warrior II® (1.2 fl oz/acre), Warrior II (1.2 fl oz/acre), and an untreated check. All plots measured 20' wide by a minimum of 30' long. Total application volumes ranged from 23.7-24.7gallons/acre depending on the equipment used at the location. All applications were at 49 psi. Application timing was between 6-9" of growth. Trials were conducted on first, second, and last cutting before September 1st, except at Tomah, which did not have a last cutting due to drought. Plots in Wisconsin were harvested on a cutting schedule to maximize alfalfa quality for use in dairy forage. Minnesota plots were harvested on a schedule to mimic good quality heifer and beef cattle forage.

Yields were taken using small plot harvesters. Subsamples for quality analysis were whole plants harvested separately from yield measurements and sent to the University of Wisconsin-Madison, for near infrared (NIR) analysis. The following data were collected from each site: yield (tons/acre), forage quality, insect counts, and stem heights. Individual plant samples were sent to Deb Samac at the St. Paul USDA-ARS lab for foliar disease rating and subsequent pathogen isolation.

Yield and quality responses to Headline both alone and with an insecticide were inconsistent at all locations. At the time of application there was no, or extremely low, evidence of fungal disease and there were no observed differences in re-growth vigor after harvest among treatments at any location.

Of the 14 observations, Headline treatment significantly ($P<0.05$) reduced defoliation and infected leaf area in 12 observations compared to the untreated check. Headline + Warrior II reduced disease significantly ($P<0.05$) in 10 observations compared to Warrior II alone. Warrior treatment had significantly ($P<0.05$) less defoliation compared to Warrior II + Headline in one observation. The greatest effect on foliar diseases was in the first cutting at all locations. There was no correlation between defoliation and yield and quality differences.

When evaluating quality measurements across locations and cuttings comparing Headline to the untreated check a positive difference (α=0.10) in crude protein was observed in three observations, and a negative protein difference (α=0.10) was observed in three comparisons. Observations of net energy of lactation were positive (α=0.10) in three observations and negative (α=0.10) in four observations.

When evaluating quality across locations and cuttings that compared Headline and Warrior II to Warrior II alone a positive difference (α=0.10) in crude protein was observed in three observations, and a negative protein difference (α=0.10) was observed in two comparisons. Observations of net energy of lactation were positive (α=0.10) in four observations and negative (α=0.10) in two observations.

The only treatment location that showed a yield difference in the fourth cutting was the Headline over the untreated check at Arlington with a 0.2 ton dry matter per acre increase. There was no yield difference observed in any other comparisons at any locations.

A procedure was developed with Victor Cabrera and Randy Shaver, UW Extension Dairy Nutrition Specialists, utilizing the UW developed Milk 2006 and the FeedVal 2012 spreadsheet tools to determine dollar values of the alfalfa harvested from the plots when feed value and or yield differences (α=0.10) were measured between treatments at locations. Corn grain, soybean meal, good quality alfalfa

hay, poor quality alfalfa hay, and corn silage were used as benchmark feeds for pricing. Alfalfa hay prices were obtained from records of actual sales of known quality tested hay from Ken Barnett, UW Extension Center for Dairy Profitability. Average feed prices from Jan. 2012-Nov. 2012 were used for the benchmark feeds. Dry matter values calculated ranged from $222/ton for the lowest quality to $285/ton for the highest quality harvested.

Treatment costs were obtained from a survey of agronomy dealers requesting the costs of Headline (9 fl. oz/acre) and applications fees. A treatment cost of $35/acre was assigned to the Headline treatment and included the application fee ($8/acre); it reflects the average cost of applying only the fungicide. A treatment cost of $27 was assigned to the Headline + Warrior treatment; it excludes the application fee and the cost of Warrior. Return on investment ranged from -$104/acre to $93.91/acre.

In summary, the trials conducted in 2012 had similar results to the trials conducted at three locations in Wisconsin and Minnesota in 2011. Response to the application of Headline was variable and inconsistent both years.

The project group is looking at the feasibility of additional trials in 2013 to evaluate alfalfa response to the application of foliar fungicide.