

CruiserMaxx Alfalfa Technical Bulletin

Syngenta is elevating the level of protection growers can provide their alfalfa crop by introducing CruiserMaxx[®] Alfalfa seed treatment insecticide/fungicide, an on-seed application of separately registered products. By combining the fungicides Apron XL[®] and Maxim[®] 4FS with Cruiser[®] insecticide, CruiserMaxx Alfalfa serves as a valuable tool to help young alfalfa seedlings develop a productive stand. Through defense against early-season diseases and insects, as well as the Cruiser Vigor Effect provided by the thiamethoxam component in Cruiser, CruiserMaxx Alfalfa helps alfalfa crops:

- Develop stronger roots
- Use inputs more efficiently
- Emerge faster
- Grow more evenly to help the crop succeed during the critical stand establishment timeframe

As alfalfa seed germinates and young plants begin to emerge, the active ingredients in CruiserMaxx Alfalfa rapidly translocate throughout each plant, helping create a healthy, vigorous stand in one convenient treatment. The unrivaled disease protection of mefenoxam (Apron XL) and fludioxonil (Maxim 4FS) safeguard alfalfa seeds against early-season yield-robbers like *Pythium* and *Phytophthora*. At the same time, the market-leading, systemic insect defense of thiamethoxam (Cruiser) helps prevent aphids and early-season leafhoppers from attacking young seedlings. Offering the benefits of three proven chemistries in one top-performing product, CruiserMaxx Alfalfa delivers a more vigorous stand and higher-quality yield potential.



Properties

Active Ingredients: mefenoxam, fludioxonil, thiamethoxam

- The systemic activity in **mefenoxam** effectively inhibits mycelial growth and spore formation, enabling easier alfalfa emergence.
- **Fludioxonil** protects alfalfa seeds from day one by concentrating in the rhizosphere around the seed and penetrating for maximum disease protection.
- **Thiamethoxam** moves systemically throughout the alfalfa seed and young seedling, protecting against target pests through contact and stomach activity. More than 9,000 trials in multiple crops have proven that Cruiser provides higher yields when directly compared with other neonicotinoids, even under low insect pressure or in the absence of insect pests. The Cruiser Vigor Effect is a broad variety of physiological plant responses to the treatment of Cruiser that help alfalfa grow more efficiently under an extended spectrum of unfavorable environmental conditions and abiotic stresses. It helps alfalfa develop a stronger root system, use inputs like water and nutrients more efficiently, emerge more quickly and grow more evenly. Vigorous plants deliver higher and more consistent yields, provide enhanced quality and require fewer resources.

Use Rates

- Cruiser 5FS: 0.001 mg ai/seed*
- Apron XL: 0.64 fl. oz./100 lbs. seed
- Maxim 4FS: 0.08 oz./100 lbs. seed

*Based on an average of 210,000 alfalfa seeds per pound.

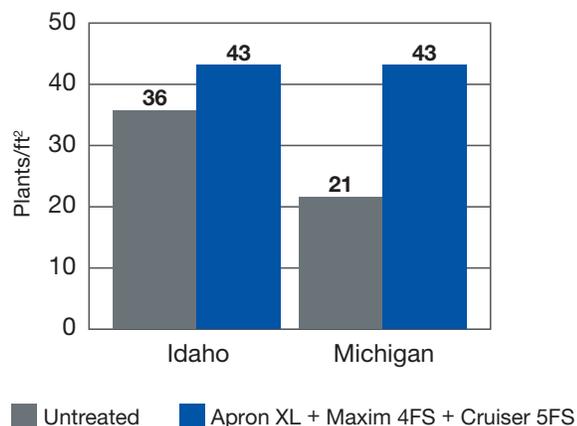
Use Guidelines

- CruiserMaxx Alfalfa may be applied only by a commercial seed treater or seed company.
- Forage may not be grazed until 30 days after planting.

Advantages of CruiserMaxx Alfalfa Seed Treatment

- Systemic disease and early-season insect protection in one convenient application of separate products maximizes seed germination and seedling emergence
- Proven performance that helps increase plant stand establishment, uniformity and vigor, leading to improved yield and quality
- Complementary to high-value seed to help ensure every seed counts
- Component products are specially formulated to deliver optimal seed safety without interfering with inoculants
- Excellent performance in variable weather conditions to ensure germination and emergence regardless of weather
- More robust and vigorous alfalfa plants, even in the absence of insects, via the Cruiser Vigor Effect

**Alfalfa Emergence:
Untreated vs. CruiserMaxx Alfalfa**



Rates: Apron XL 0.311 fl. oz./cwt, Maxim 4FS 0.08 oz./cwt, Cruiser 5FS 0.001 mg. a.i./seed.
2010 results. University of Idaho trial rating taken 11 days after planting.
Michigan trial rating taken 8 days after planting.

Pest Spectrum

Disease Protection

- *Pythium* damping-off
- Early-season *Phytophthora*
- Seedborne and soilborne fungi that cause decay, damping off and seedling blight
- Downy mildew (suppression)

Insect Protection

- Aphids
- Leafhoppers (first cut only)

Defense Against Key Diseases

Pythium is the most common and widespread pathogen causing delayed emergence and damping off of seeds and young alfalfa seedlings. *Pythium* also inhibits lateral root formation, which prompts poor stand and crop establishment.

Early-season *Phytophthora* is typically found in poorly drained soils or in clay-loam soils during extended periods of wet weather. Symptoms range from reduced root systems or stunted plants to wilting and/or damping off.

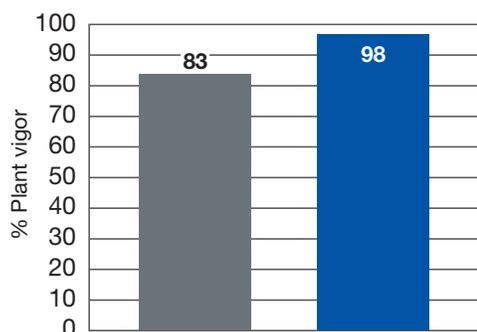
Aphids

Three species of aphids threaten alfalfa crops

Spotted alfalfa aphid (*Therioaphis maculata*), pea aphid (*Acyrtosiphon pisum*) and blue alfalfa aphid (*Acyrtosiphon kondoi*) are the three most common species in alfalfa. Their damage includes:

- Wilting, stunted plant growth, thinned stands, reduced tonnage and chlorosis of leaves (yellowing discoloration)
- Spotted alfalfa aphids can also:
 - Transmit a plant toxin while feeding, resulting in early leaf drop
 - Cause veinbanding—clearing of veins of newly formed leaves near plant terminals

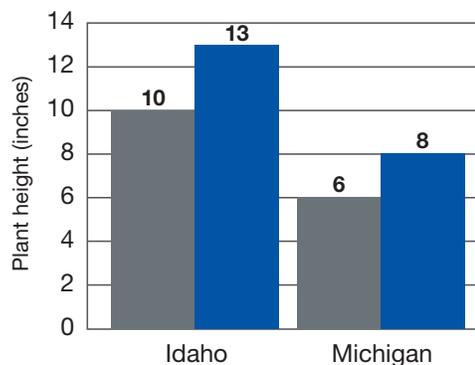
**Alfalfa Plant Vigor:
Untreated vs. CruiserMaxx Alfalfa**



■ Untreated ■ Apron XL + Maxim 4FS + Cruiser 5FS

Rates: Apron XL 0.311 fl. oz./cwt, Maxim 4FS 0.08 oz./cwt, Cruiser 5FS 0.001 mg. a.i./seed. 2011 results. Michigan. Ratings taken from trial 20 days after planting.

**Alfalfa Plant Height:
Untreated vs. CruiserMaxx Alfalfa**



■ Untreated ■ Apron XL + Maxim 4FS + Cruiser 5FS

Rates: Apron XL 0.311 fl. oz./cwt, Maxim 4FS 0.08 oz./cwt, Cruiser 5FS 0.001 mg. a.i./seed. 2010 results. Ratings taken from 10 plants per plot. University of Idaho trial rating taken 52 days after planting. Michigan trial rating taken 41 days after planting.

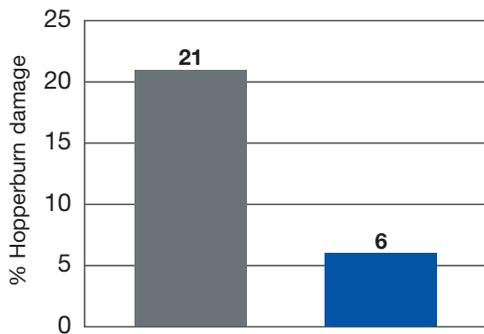


Alfalfa Leafhoppers

Leafhoppers cause reductions in crop quality, stand longevity and yield. Young seedlings are more susceptible to increased root rot and stand failure. The bulk of damage is done between mid-June and mid-August, during the second, third and fourth cuttings. Damage includes:

- Severely stunted alfalfa growth, resulting in yield loss
- Severe leafhopper injury, which can reduce hay quality and cause a reduction in protein and vitamin A
- Hopper burn injuries, which are a result of salivary toxins injected into the plant during the feeding process and characterized by a V-shaped yellow area on the leaf tip. Hopper burn injuries can quickly spread through the entire leaf, and eventually, through an entire field.

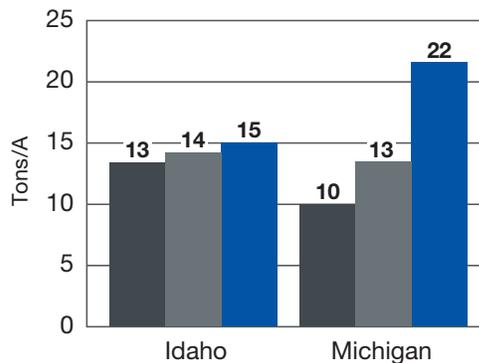
Alfalfa Leafhopper Protection



■ Untreated ■ Apron XL + Maxim 4FS + Cruiser 5FS

Rates: Apron XL 0.311 fl. oz./cwt, Maxim 4FS 0.08 oz./cwt, Cruiser 5FS 0.001 mg. a.i./seed.
Michigan. Average of 2010-2011 results.
Ratings taken 81-85 days after application.

Alfalfa Yield



■ Untreated ■ Apron XL + Maxim 4FS
■ Apron XL + Maxim 4FS + Cruiser 5FS

Rates: Apron XL 0.311 fl. oz./cwt, Maxim 4FS 0.08 oz./cwt, Cruiser 5FS 0.001 mg. a.i./seed.
2010 results.