

IN-FURROW FUNGICIDE AND STARTER FERTILIZER APPLICATION EFFECTS ON SUGARBEET STAND ESTABLISHMENT

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ABSTRACT

Rhizoctonia crown and root rot (RCRR), caused by *Rhizoctonia solani* AG 2-2, is a common root disease on sugarbeet. Postemergence applications of azoxystrobin typically are used for disease control, but in-furrow (I-F) fungicides provide excellent control without application timing concerns. Stand establishment problems, however, are a concern, especially when applied in combination with starter fertilizer. The objective of this research was to evaluate the effect on sugarbeet stand and sucrose yield of fungicides applied in-furrow either down the drip tube or by t-band, alone and in combination with 3 GPA 10-34-0 starter fertilizer at two planting dates in both 2011 and 2012.

The experiment was set up in a randomized block design with 4 replicates. Plots were six rows (22-inch row spacing) by 35 ft and seed was sown at 4.5-inch seed spacing. Fungicides (azoxystrobin, pyraclostrobin, and penthiopyrad) were applied in-furrow, alone and in combination with starter fertilizer (6 GPA total volume), by two methods: 1) down the drip tube at 18 psi and 2) in a t-band (Teejet 400067E nozzle at 30 psi) positioned directly behind the disc openers. Application of starter fertilizer was always down the drip tube. A no-fungicide control with and without starter fertilizer was also included. Planting dates one and two were May 16 and 25, respectively, in 2011 and April 19 and May 8, respectively, in 2012. All trials were sown at the University of Minnesota, Northwest Research and Outreach Center in Crookston. Sugarbeet stand data were collected from one to six wk after planting in 2011 and two to six wk after planting in 2012. The center two rows of each plot were harvested September 26 for all trials and data were collected for RCRR, number of harvested roots, yield, and quality. Data were subjected to analysis of variance for interactions of starter fertilizer x fungicide x fungicide application method, fungicide x application method, fungicide x starter fertilizer and main effects of starter fertilizer, fungicide, and fungicide application method.

In both trials in 2011, there were significant fungicide x application method interactions for most stand counts, but no significant starter fertilizer x fungicide x fungicide application method or starter x fungicide interactions. Azoxystrobin applied by t-band and pyraclostrobin applied down the drip tube reduced stands compared to no fungicide for both planting dates in 2011 and penthiopyrad applied down the drip tube reduced stands compared to no fungicide in the second planting date of 2011. In the first planting date of 2012, there was a significant three-way interaction (starter fertilizer x fungicide x fungicide application method) for most stand count dates. Azoxystrobin and pyraclostrobin applied by t-band reduced stands when starter fertilizer was also applied compared to the same fungicides applied down the drip tube or the same fungicides without starter. Vertisan reduced stand slightly when applied with starter compared to without starter regardless of application method. In the second planting date in 2012, conditions were very dry, and interactions and main effects were rare.

There was a significant main effect of starter fertilizer application on stand data in all four trials. Stands at four weeks after planting in each trial with no starter and starter, respectively, averaged 201 and 189, 160 and 148, 191 and 162, and 102 and 84 per 100 ft of row.

Main effects and their interactions were not significant for RCRR or most harvest parameters in the four trials. Overall, impact of starter fertilizer was more consistent in reducing stands than application of in-furrow fungicides, which varied by application method.