

ULSTAD, V. L.<sup>1\*</sup>, BARDINELLI, T. R.<sup>2</sup>, J. S. BARNES<sup>2</sup>, and R. E. GOLD<sup>2</sup>, <sup>1</sup>BASF Corporation, 4120-15<sup>th</sup> St. South, Fargo, ND 58104 and <sup>2</sup>BASF Corporation, Research Triangle Park, 26 Davis Drive, NC 27709. **BAS 500F, a new fungicide for *Cercospora beticola* control in sugarbeet.**

#### ABSTRACT

BAS 500F (F500) is a new broad spectrum strobilurin fungicide being developed by BASF for numerous crops, including cereals, citrus, cucurbits, grapes, peas and beans, peanuts, potatoes, sugarbeet, tomatoes, and turf. The active ingredient has been designated as a "Reduced Risk" candidate by the EPA. Studies have shown that F500 has excellent preventative and curative properties but these are dependent on the specific disease system. It inhibits spore germination, germ tube elongation, mycelial growth, and sporulation. It will provide a long period of residual protection. It has local systemic activity and exhibits excellent translaminar mobility. F500 acts within the fungal cell by inhibiting electron transport in the mitochondrial respiratory chain at the cytochrome-bc1 complex. The restriction of electron flow through the mitochondrial pathway inhibits the synthesis of ATP. After treatment with F500, the ATP levels are not sufficient for disease development.

F500 was first screened for activity against sugarbeet diseases in the United States in 1997. The objective was to determine 1) if sugarbeet was tolerant to F500 applications, and 2) what level of biological efficacy the compound had on key fungal diseases in sugarbeet.

The compound was field screened at three locations in Minnesota and North Dakota in 1997, targeting *Cercospora beticola* leafspot. Applications were made with hand-held boom, CO<sub>2</sub>-pressurized backpack sprayers. F500 at each location gave *Cercospora* leafspot control comparable to the best treatments in the trials.

In 1998, F500 was field screened at four locations in Minnesota and North Dakota. Treatments were made with hand-held boom, CO<sub>2</sub>-pressurized backpack sprayers. At each location, F500 gave excellent *Cercospora* leafspot control and recoverable sucrose per acre better than labeled fungicide treatments. Evaluation of two formulations, one without an adjuvant and one with an adjuvant in the formulation, was made. Results indicated that *Cercospora* leafspot control tended to be higher with the adjuvant-included formulation, while recoverable sucrose per acre was comparable with the two formulations. In 1999, F500 was field screened at five locations in Minnesota, Montana, and North Dakota. Treatments at one location were applied with a hand-held boom, CO<sub>2</sub>-pressurized backpack sprayer. Treatments at four locations were applied with tractor-mounted, CO<sub>2</sub>-pressurized plot sprayers delivering 20 gallons per acre of spray solution at 100 to 120 psi spray pressure. At each location, an F500-containing treatment gave the best *Cercospora* leafspot control and the highest recoverable sucrose per acre. A rate comparison indicated that *Cercospora* leafspot and recoverable sucrose per acre were best when F500 was applied at 0.15 rather than 0.10 lb ai per acre. Four adjuvant types were evaluated with F500 applied at 0.15 lb ai per acre. The addition of an adjuvant to F500 applications generally enhanced *Cercospora* leafspot control and resulted in higher recoverable sucrose per acre than when F500 was applied without an adjuvant. Of the adjuvants evaluated (nonionic surfactant, crop oil concentrate, methylated seed oil, organosilicone), the crop oil concentrate and methylated seed oil treatments tended to give the best *Cercospora* leafspot control and recoverable sucrose per acre.

F500 will be recommended in the sugarbeet market as part of a disease resistance management program.