

KHAN, MOHAMED F.R.^{1*}, LARRY J. SMITH², MARK BREDEHOEFT³, STEVE ROEHL³, AND RANDY NELSON¹, ¹North Dakota State University & University of Minnesota, Soil Science Department, Fargo, ND 58105-5758, ²University of Minnesota, Northwest Research and Outreach Center, Crookston, MN 56716, and Southern Minnesota Beet Sugar Cooperative, Renville, MN 56284. **Managing Cercospora leaf spot on sugarbeet with fungicides.**

Cercospora leaf spot is the most serious foliar disease of sugarbeet in Minnesota and North Dakota. The objective of this study was to evaluate the efficacy of labeled and experimental fungicides, and determine the best fungicide rotation for managing *Cercospora* leaf spot. In 2002, studies were conducted at Crookston, Breckenridge, and Willmar, MN. In 2003, studies were conducted at Crookston, Foxhome, and Renville, MN. Each plot was 6 22-inch rows wide by 30 or 35 feet long. All experiments were arranged in a randomized complete block design with four replications. Treatments were applied with 4-nozzle boom sprayers calibrated to deliver 20 gal/acre of solution at 100 psi pressure to the middle 4-rows of plots. Treatments were applied at 14 or 21 d intervals. *Cercospora* leaf spot severity was assessed throughout the season. The middle 2-rows of plots were harvested and root yield and quality were determined. All sites were affected by *Cercospora* leaf spot. Disease severity varied from moderate to high at the different locations. In 2002, at Crookston and Breckenridge, the use of two, three, or four different classes of fungicides in an alternation program, provided significantly better *Cercospora* control and significantly higher recoverable sucrose than the untreated check. At Willmar, 4 applications of two different classes of fungicides provided effective disease control and significantly high recoverable sucrose than the untreated check. In 2003, at all locations, all fungicide alternations resulted in significantly better disease control and significantly higher recoverable sucrose compared to the untreated check. In both 2002 and 2003, treatments that included Eminent, and/or Headline or Gem, consistently provided effective *Cercospora* control.

INTRODUCTION

Sugarbeet (*Beta vulgaris* L.) is one of the most important irrigated crops in the northern Great Plains (N-GP) including Western North Dakota and Eastern Montana. Irrigated sugarbeet production in the N-GP is an annual, broad-based crop and increasingly being evaluated for rotation with soybean as Sidney, Montana in the N-GP (Fig. 1) and the two crops are occasionally grown adjacent to each other (Figure 1B). Both crops are hosts of different species of *Cercospora* leaf spot. *Cercospora* leaf spot is a host of *Cercospora* leaf spot and *Cercospora* leaf spot is a host of *Cercospora* leaf spot. *Cercospora* leaf spot, caused by *C. beticola*, is one of the most important diseases of sugarbeet and occurs wherever the crop is grown (Hilchenbacher and Walters 1972). Without control, the disease results in significant root yield loss, reduced sugar content of sugarbeet, sugar extraction and root storage life (Smith and Ruppel 1977; Shreve and Terry 1992). According to Shreve and Terry (1992) yield losses to *Cercospora* leaf spot can be as high as 30%. *Cercospora* leaf spot of sugarbeet caused by *C. beticola* was first reported in India in 1934 where epidemics occurred in some years (Ashri 1971). He cited several references that indicate that the disease has been observed only in the old world (Africa, Asia and Europe) and specific references in Pakistan, Iran, Israel and India (Munzel and Huang 2003). Symptoms are characterized by round to irregular slightly swollen brown black spots up to 1 cm diameter with occasional yellowing rings at the border. Stomata of the petioles appear as small black dots in