

METZ, NICHOLAS J.* and MELVIN D. BOLTON, USDA – ARS, Northern Crop Science Laboratory, 1605 Albrecht Blvd. N, Fargo ND 58102-2765. **Augmenting fungicidal activity of tetraconazole with chemosensitization agents for *Cercospora* leaf spot management.**

Cercospora leaf spot (CLS) caused by *Cercospora beticola* is one of the more destructive foliar diseases of sugar beet. Management strategies for CLS rely on timely fungicide application. CLS management fungicide repertoire often include the application of fungicides in the sterol demethylation inhibitor (DMI) class. The reliance on DMIs has led to the emergence of resistance in *C. beticola* populations. Co-application of certain natural compounds may increase efficacy of DMIs through a process called chemosensitization. Chemosensitization can be accomplished by combining the chemosensitization agent (CA) with a commercial fungicide where, alone, neither compound would be effective. This process may reduce the probability of resistance development and may lead to higher fungicide efficacy. The CAs used in this experiment (thymol, octyl gallate, cinnamaldehyde, salicylaldehyde, kojic acid, carpropamid, fenoxanil, pyroquilon, 2-hydroxy-4-methoxybenzaldehyde (2H4), and 3,5- dimethoxy-4-hydroxy-acetophenone (3,5 DH)) were identified from other experiments that had showed promise in managing other fungal plant pathogens. To investigate their potential, seven strains of *C. beticola* with high resistance ($EC_{50} \sim 10.0 \mu\text{g ml}^{-1}$) to the DMI fungicide tetraconazole were collected from throughout ND and MN. *C. beticola* spores were collected and adjusted to the concentration of 10^3 spores ml^{-1} before being inoculated into a 96 well micro-titer plate. The strains were grown in non-amended media, media amended with tetraconazole at $1.0 \mu\text{g ml}^{-1}$, and media amended with tetraconazole at $1.0 \mu\text{g ml}^{-1}$ and a CA with varying concentrations (10.0, 1.0, 0.1, and 0.01 mM). Fungal growth was measured using a microplate reader. Initial results showed that the most effective CA in fungal growth reduction was octyl gallate at 0.1 mM. Thymol, salicylaldehyde, pyroquilon, cinnamaldehyde, and 2H4 are also good candidate CAs at 1.0 mM. The remaining CAs showed no difference in growth reduction.