

WEBB, KIMBERLY M.^{1*}, STEPHEN J. DELGROSO², MARK S. WEST³, CLAIRE FREEMAN¹, and TAMMY BRENNER¹, ¹USDA-ARS, Soil Management and Sugar Beet Research Unit, 1701 Centre Ave., Fort Collins, CO 80526; ²USDA-ARS, Soil Management and Sugar Beet Research Unit, 2150 Centre Ave., Bldg. D, Fort Collins, CO 80526 and ³USDA-ARS, Plains Area Office, 2150 Centre Ave., Bldg. D, Fort Collins, CO 80526. **Influence of environment, crop age, and variety on the development and severity of Fusarium yellows in field-grown sugar beet.**

Fusarium yellows, caused by multiple *Fusarium* spp., is an important disease of sugar beet in many production regions and leads to considerable reductions in root yield, sucrose percentage, and juice purity. Due to the increasing incidence of Fusarium yellows and the potential impacts of climate change on plant disease development, a better understanding of how the environment contributes to disease severity would provide additional strategies for managing losses due to Fusarium yellows. However, little is known about what environmental factors are most influential for the development and severity of disease in the field, nor how sugar beet responds to these abiotic stresses. Therefore, the occurrence of Fusarium yellows in a susceptible, moderately susceptible, and a resistant variety of field grown sugar beet were monitored and correlated with the environmental conditions during the growing season over a four year period. While Fusarium yellows, caused by multiple *Fusarium* spp., gradually increased during the field season with crop age, soil moisture appeared to be the environmental factor most correlated with Fusarium yellows severity throughout the growing season. Higher soil moisture content was generally associated with higher levels of Fusarium yellows particularly as the growing season progressed. During drier years disease severity was less, especially for the resistant variety. We also developed variety specific prediction models based on crop age and soil water content which explained 57-89% of the observed variability in disease severity based on these findings.