WEBB, KIMBERLY M.[1*] and COREY D. BROECKLING[2]. [1]USDA-ARS, Soil Management and Sugar Beet Research Unit, 1701 Centre Ave., Fort Collins, CO 80526 and [2]Proteomics and Metabolomics Facility, Colorado State University, C130 Microbiology, Fort Collins CO 80523. **Elucidation of Rhizoctonia crown and root rot disease response in sugar beet during infection with *Rhizoctonia solani* AG 2-2 IIIB.**

Sugar beet can be significantly impacted by Rhizoctonia crown and root rot caused by *Rhizoctonia solani* AG 2-2 IIIB. The molecular processes that mediate compatible and incompatible sugar beet interactions with *R. solani* are largely unknown and identifying the metabolites associated with *R. solani* infection may provide evidence for important biological pathways involved with resistance or susceptibility. The metabolic changes that occurred during susceptible and resistant *R. solani* interactions were compared with mock inoculated treatments and characterized using a non-targeted metabolomics workflow spanning primary and secondary metabolism products. Preliminary experiments revealed clear distinctions between tissue type and genotype, and more subtle changes in response to inoculation that was dependent on genotype by 7 days after inoculation (dai). To gain additional information, later stages of the infection process were investigated. Metabolites were extracted from infected and healthy root tissue at 0, 7, 14, and 21 dai to best reflect the *R. solani* infection process. Again data revealed clear differences in metabolites between genotype, but also additional differential metabolite expression based on time after inoculation and infection with *R. solani*. In contrast to the previous study, GC-MS appeared to be more sensitive than UHPLC-MS, therefore more primary metabolites were differentially expressed. However several of these metabolites are of unknown nature. Interestingly, most of the significantly changing metabolites occurred in the susceptible genotype after 14-21 days after infection. Several phytolexins, terpenes, and alkaloids, were identified in all treatments indicating some that have roles in host defense even during susceptible interactions. Several biochemical pathways appear to be involved during susceptible and resistant interactions with *R. solani*, and indicate a complex role of primary and secondary metabolites in sugar beet during fungal interactions.