REYNOLDS, GREGORY J.[1*], CAROL E. WINDELS[2], IAN V. MACRAE[3] and SOIZIK LAGUETTE[4], [1]University of California-Davis, Department of Plant Pathology, Davis, CA 95616; [2]University of Minnesota, Department of Plant Pathology and Northwest Research and Outreach Center, Crookston, MN 56716; [3]University of Minnesota, Department of Entomology and Northwest Research and Outreach Center, Crookston, MN 56716 and [4]University of North Dakota, Department of Earth System Science and Policy, Grand Forks, ND 58202. **Remote sensing for assessing Rhizoctonia crown and root rot severity in sugar beet.**

Rhizoctonia crown and root rot (RCRR), caused by *Rhizoctonia solani* AG-2-2, is an increasingly important disease of sugar beet in Minnesota and North Dakota. Disease ratings are based on subjective, visual estimates of root rot severity (0–7 scale; 0=healthy; 7=100% rotted, foliage dead). Remote sensing was evaluated as an alternative method to assess RCRR. Field plots of sugar beet were inoculated with *R. solani* AG 2-2 IIIB at a range of inoculum densities at the 10-leaf stage in 2008 and 2009. Data were collected for 1) hyperspectral reflectance from the sugar beet canopy and 2) visual ratings of RCRR in 2008 at 2, 4, 6, and 8 weeks after inoculation (WAI) and in 2009 at 2, 3, 5 and 9 WAI. Green, red, and near-infrared reflectance and several calculated narrowband and wideband vegetation indices (VIs) correlated with visual ratings of RCRR, and all resulted in strong non-linear regressions. Values of VIs were constant until 25 to 50% of the root surface rotted and then decreased significantly as disease severity increased. RCRR also was detected using airborne, color-infrared imagery at 0.25 m and 1 m resolution. Remote sensing can detect RCRR but not before initial appearance of foliar symptoms.