952

Paper presented at the International Rice Congress 2023 from October 16-19 in Manila, Philippines.

Understanding the effects of bacterial leaf blight disease on rice spectral signature

Ziyi Wang 1 , Roshanak Darvishzadeh 1 , Alice Laborte2 , Nancy Castilla2 , Andy Nelson 1

1 Faculty of Geo-information Science and Earth Observation (ITC), University of Twente, Enschede, Netherlands. 2 International Rice Research Institute

Bacterial leaf blight (BLB) caused by Xanthomonas oryzae pv oryzae is considered as one of the most economically important diseases in tropical and temperate rice-growing areas. To manage the disease before reaching damaging levels, it is important to detect its occurrence and assess its intensity in large areas in timely and efficient manner. Traditional disease detection and assessment rely on manual observations in the field, which is often time-consuming, costly, and dependent on the ability of data collectors to accurately identify the disease. Remote sensing is an emerging technology for plant disease detection at different spatial scales. Remote sensing-based disease detection can provide valuable information for operational applications, such as designing low-cost agricultural cameras, mapping disease epidemics at different administrative levels, and estimating yield losses. Previous studies have revealed several spectral changes at the canopy level in BLB-infected rice plants but have focused only on a single development stage, such as the grain filling and maturity stages, which limits the ability to use remote sensing for early disease detection. To address this knowledge gap, a field experiment was conducted in the Philippines during the wet season of 2023, when conditions are favorable to BLB. IR24, a highly susceptible variety, was grown in the field. Hyperspectral signals were measured at the canopy level of inoculated and non-inoculated (control) plots from tillering to heading stages. We will present the spectral bands that could discriminate between BLB-infected and healthy plants and evaluate the separability of these spectral bands to identify the most sensitive bands at each development stage. The results from this study can support early detection and monitoring of BLB and prevent yield loss.