

## [P2] Farming System

Thu. Sep 9, 2021 12:15 PM - 2:00 PM Room 2 (Poster) (Farming System)

1:15 PM - 2:00 PM

### [P2-30]Detection of Lodging Area in a Paddy Field from a Digital Surface Model (DSM)

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Images acquired by a camera mounted on a UAV (unmanned aerial vehicle) can be processed to reconstruct 3D structure as a DSM. Through the use of this technique, areas where lodging has occurred can be detected by gauging the degree of lodging as the difference in relative elevation between heading and maturity, or delta plant height. The association between the degree of lodging and a vegetation indices (VIs) at various growth stages is useful for the setting of the target VI value at a certain growth stage for local topdressing. The objective of this study was to estimate the degree of lodging by using a DSM and to associate it with the values of VIs before heading. We recorded paddy fields where a rice cultivar Koshihikari was grown with various rates of nitrogen application to 2 crops a year in 2019 and 2020. Images were periodically taken by a multispectral camera mounted on a UAV and by an RGB camera mounted on another UAV. We processed the multispectral images to VI maps and the RGB images to a DSM. We created 1-m cells on the VI maps and DSM of the fields and calculated the mean values of VIs and the difference in the mean relative elevation, or delta plant height, between heading and maturity in each cell. We found highly significant associations between VIs and delta plant height. In addition to lodging, such associations could be used for determining local topdressing rates or for detecting unevenness of the soil surface or fertility in the field. This work was partly supported by Contracting Research on Policy for Agriculture, Forestry and Fisheries.