

PA-72

Study on the Method of Diagnosing the Individuals Crop Growth Using by Multi-Spectral Images

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[Abstract]

In this study, multispectral images of wheat according to soil water state were collected, compared, and analyzed to measure the physiological response of crops to environmental stress at the individual level. CMS-V multi-spectral camera(Silios Technologies) was used for image acquisition. The camera lens consists of eight spectral bands between 550nm and 830nm. Light Reflective information collected in each band sensor and stored in digital values, and it is converted into a reflectance for calculating the vegetation index and used. According to the camera manual, the NDVI(Normalized Difference vegetation index) value was calculated using 628 nm and 752 nm bands. Image measurement was conducted under natural light conditions, and reflectance standards(Labsphere) were captured with plants for reflectance calculation. The wheat variety used Gosomil, and the wheat grown in the field was transplanted into a pot after heading date and measured. Three treatments were performed so that the soil volumetric water content of the pot was 13~17%, 20~23%, and 25%, and the growth response of wheat according to each treatment was compared using the NDVI value. In the first measurement after port transplantation, the difference in NDVI value according to treatment was not significant, but in the subsequent measurement, the NDVI value of the treatment with a water content of 13 to 17% was lowest and was the highest at 20 to 23%. The NDVI values decreased compared to the first measurement in all treatment, and the decrease was the largest at 13-17% water content and the smallest at 20-23%. Although the difference in NDVI values could be confirmed, it would be difficult to directly relate it to the water stress of plants, and further research on the response of crops to environmental stress and the analysis of multi-spectral image will be needed.

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