

Laser-Induced Fluorescence Imaging System for Weather Stress Analysis in Plant Leaves of Different Wheat Varieties

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Field plants can be exposed to several stresses. Early detection of any change in plant health is important in order to undertake an action to restore its vitality. In this paper, a new approach towards characterization of nutritional lacks in wheat leaves of different varieties has been proposed. The developed procedure is based on a laser-induced fluorescence (LIF) imaging system, which allows scanning of emission intensity distribution over the sample surface. Importantly, the new technique is non-invasive and allows for *in-situ* field analysis of leaves, as the LIF system is housed in a laboratory vehicle. Detection is based on chlorophyll fluorescence-emission band ratios. It allows for the analysis of leaf surface and for the establishment of the relation between emission and the type of wheat variety. The measurements were made in test areas grown with different varieties of a particular wheat type, called long cycle wheat. The proposed technique provides an appropriate method of analysis of different wheat varieties with regard to irregular weather conditions in the investigated region.