Variation of leaf blade optical properties with the time cut from plant

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Introduction

Quantification of the behavior of light scattering from leaves is critical to investigate the interaction of radiation with plants. Methods for measuring light distribution scattering from plant leaf have been developed from 2-dimensional plane to 3-dimensinal space. Most of these measurements were taken in lab and the samples of leaves were cut from plants. Does leaf optical properties keep stable while it is under tests? A experiment was carried out to answer this question.

Materials and Methods

Maize (*Zea mays* L. variety 'PingYu 5') leaf blades were taken as test samples in the early grain filling stage. On illumination of 650 nm and 780 nm with incidence azimuth angle of 60^o and zenith angle of 0^o , angular reflectance of maize leaves were recorded at viewing azimuth angle of 60^o and zenith angles of -50^o, -40^o, -30^o, -10^o, 0^o, 10^o, 30^o, and 50^o respectively within 4 h at an interval of 5 s, with first record started 1 min after the sample cut from the plant.

Results and Conclusion

Angular reflectance increased slowly with the cut time at wavelength of 780 nm. With illumination of 650 nm, the variation of reflectance was relatively small in the first 50 min, and it had a sharply increase in the following 40 min and then it had a smoothly increase with the cut time. It is recommended to finish the angular reflectance measurement in 50 min after leaf sample cut from plant if the measurement *in situ* is not possible. Further work is expected to explain the variation of leaf optical properties with the time cut from plant.

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