

SPECTRAL EVOLUTION

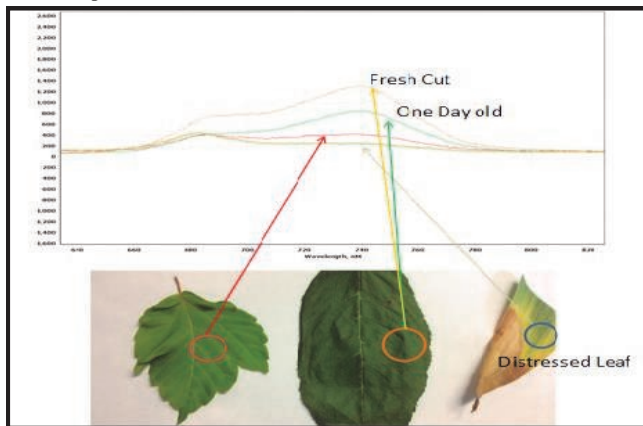
Chlorophyll Fluorescence Detection

Measuring chlorophyll is important for determining plant health, as well as water quality by measuring the distribution of phytoplankton or algae. Using SPECTRAL EVOLUTION field portable spectrometers, you can measure chlorophyll fluorescence by comparing the chlorophyll *a* and chlorophyll *b* peaks in the spectra you collect.

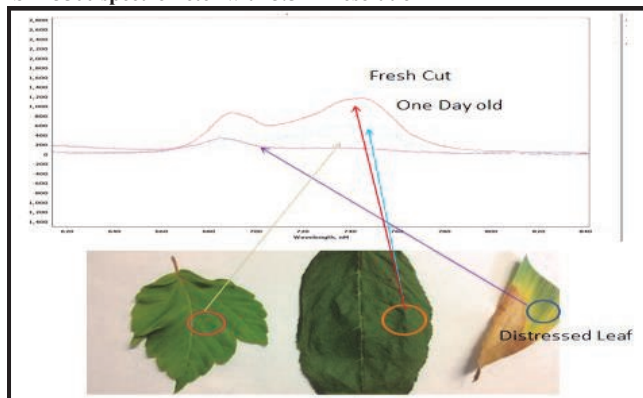
There are actually four related chlorophyll molecules: *a*, *b*, *c*, and *d*. Chlorophyll *a* and *b* levels can be used as indicators of plant health. They are also important in water studies where researchers are looking at the health of a particular body of water. In those applications the chlorophyll provides an indication of nutrients in the water for tracking algal growth.

With plant leaves, measuring chlorophyll fluorescence can be used to detect nutritional value and the presence of pathogens. A green laser light was used on different sample leaves at 530nm to produce fluorescence which was then measured from 640-820nm by an LF-880 UV/VIS/NIR spectrometer using a single 512 channel silicon array.

LF-880 spectrometer with 2.0nm resolution



SM-3500 spectrometer with 3.5nm resolution



As shown to the left, the spectra clearly indicates the difference in chlorophyll *a* and *b* in different samples, from healthy to distressed with a positive connection between fluorescence and chlorophyll concentration that can be found between the 740 and 760nm bands.

A similar spectra collected with an SM-3500 spectrometer with a spectral range of 350-2500nm, shows the difference in amplitude between 680 and 700nm and 740 and 780 nm for the healthy and distressed leaves. Peaks are easier to see with the higher resolution SM-3500.



The LF-880 is a lightweight, highly reliable spectrometer with auto-exposure and auto-shutter for one touch operation. Its compact design makes it easy to fit into your lab set-up.



The SM-3500 is a full range field portable spectrometer perfect for measuring chlorophyll in forest canopies, single leaf studies, and water body research.

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