

# SPECTRAL EVOLUTION

## Plant Health and the Red Edge

NIR spectrometers and spectroradiometers are essential tools in determining the health of vegetation in the field. A field spectroradiometer such as the Spectral Evolution PSR+, allows researchers to investigate the health of vegetation, including crops by measuring plant stress.

There are many factors that can affect plant health—lack of water/over watering, over/under fertilization, pest infestation, poor drainage, lack of soil nutrients, and much more. Field NIR spectroscopy allows for the investigation of plant health and stress *in situ*. It is faster, less expensive and non-invasive when compared to traditional lab-based analysis methods. In addition, one scan can collect data that can be analyzed for variety of characteristics.

Healthy plants produce more chlorophyll. Using a portable PSR+ field spectroradiometer with our unique leaf clip, a researcher can scan individual plant leaves and measure health and stress by looking at the “red edge” in the 680-760nm range of vegetation spectra. The red edge is usually centered around 720nm.

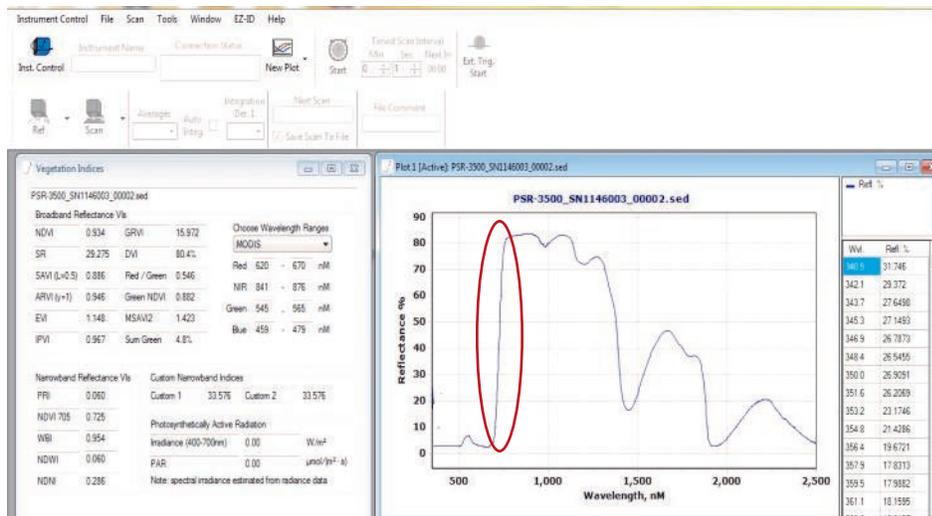
In healthy plants the red edge shifts toward longer wavelengths—to the right in a typical spectra. In addition since more energy is absorbed during photosynthesis, there is a deeper absorption feature at 680nm. In stressed plants, the red edge is further toward the shorter wavelengths—the left—and there is less absorption and more reflectance at 630nm since less light is being used for photosynthesis.



*The PSR+ provides high resolution and high sensitivity in a rugged and reliable field spectroradiometer.*



*Our unique leaf clip has an external trigger and a remote light source that makes it easy to use in the field and keeps heat away from your sample for better scans.*



*The leaf scan in this screen from the PSR+ DARWin SP Data Acquisition software has the red edge for this sample circled in red.*

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