Chlorophyll Concentration Meter | MC-100  Patented

Measure chlorophyll not SPAD.

Linear Output
The Apogee chlorophyll concentration meter is calibrated to measure chlorophyll concentration in leaves with units of μmol of chlorophyll per m². This eliminates the problems with relative indexes of chlorophyll, like the SPAD index, which is not linearly related to chlorophyll concentration.
For reference and comparison purposes, the Apogee meter also outputs relative units (CCI or SPAD) if desired. For details see: Parry, C., Blonquist Jr., J.M., & Bugbee, B. 2014. In situ measurement of leaf chlorophyll concentration: analysis of the optical/absolute relationship. Plant, Cell and Environment 37:2508-2502.

Non-destructive Measurement
The meter measures the ratio of radiation transmittance from two wavelengths (red, strongly absorbed by chlorophyll, and near infrared, not absorbed by chlorophyll), making measurements non-destructive and nearly instantaneous (measurement time is less than 3 seconds). This facilitates rapid measurement of multiple leaves and monitoring of the same leaves over time.

Storage Capacity and Geo-referencing
Memory allocated to data storage allows for 160,000 logged measurements. A mini USB port allows for direct connection to a computer to download data. An RS-232 port is available for external GPS connection, allowing field data to be geo-referenced. Storage capacity of geo-referenced data is 94,000 measurements.

Typical Applications
Applications include: chlorophyll concentration determination in plant leaves for assessment of nutrient status, fertilizer requirements, evaluation of stress, and optimization of harvest.
Chlorophyll meters typically output an index that is non-linearly related to chlorophyll concentration (e.g., CCI or SPAD). The MC-100 outputs an estimate of actual chlorophyll concentration in units of µmol per m² of leaf surface, thus, changes in the displayed output are true changes in chlorophyll concentration. For example, a doubling of measured chlorophyll concentration represents an actual doubling in a plant leaf, whereas a doubling of a relative index does not necessarily represent a doubling of actual chlorophyll concentration in the leaf. This concept is illustrated for CCI and SPAD index measurements on rice leaves in the graphs below.