

# CCM-200 plus Chlorophyll Content Meter

*... cited in more than 400 published scientific papers*



## Application

- Measure Chlorophyll in Intact Samples
- Monitor Effects of Environmental Stress
- Evaluate and Determine Nutrient Performance and Requirements
- Teaching and Research

## Features

- Non-Destructive Measurement
- Lightweight, Hand-Held Design Optimized for Field Work
- Display Chlorophyll Content Index and Calculated Sample Averages
- Built-in Data-Logging
- USB and RS-232 Connectivity

The New CCM-200 Chlorophyll Content Meter provides fast accurate, chlorophyll readings on the intact leaves of plants and crops. No more grinding or destructive assays! The measurement is rapid, accurate and simple to obtain, allowing researchers and agronomists to gather and evaluate mission critical data faster than ever before. Especially useful for improving **Nitrogen** and **Fertilizer** management programs with corn and wheat, the CCM-200*plus* can be used on a wide variety of both C<sub>3</sub> and C<sub>4</sub> plants.

The CCM-200 *plus* is designed to be the most repeatable portable chlorophyll content meter available. It incorporates a larger measuring area for signal averaging over a larger sample area. This approach provides a more reliable reading that takes into account small structure variations that can affect repeatability and reliability when compared to smaller area sampling. Accuracy of measurement is determined by correlation with chemical tests. Results have shown, that the CCM-200 *plus* is as accurate and any chlorophyll meter on the market and may be even more accurate on samples with very high chlorophyll content.

The CCM-200 *plus* has the largest on-board memory of any chlorophyll meter, storing over 94,000 measurements internally. Users can record days of measurements without having to repeatedly return to the lab or worrying about limited memory. Downloading of data is quick and easy either through its universal USB 1.1 interface or RS-232 port. Employing a new MEDICAL grade strict tolerance LED source increases accuracy and insures consistent meter to meter readings.

# CCM-200 plus Chlorophyll Content Meter

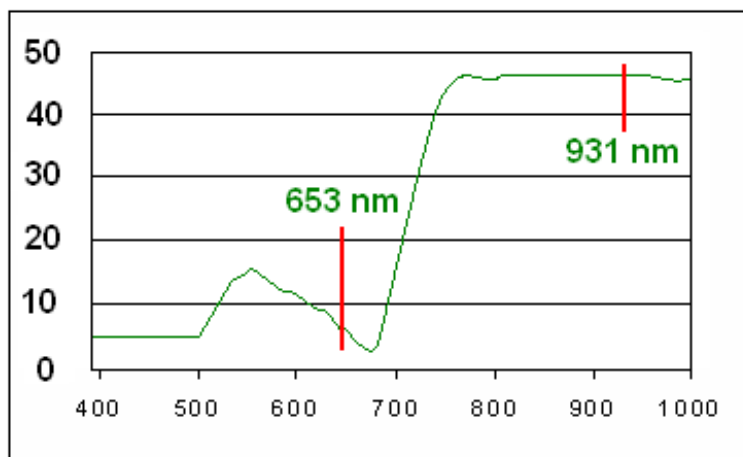
Nitrogen Status

Agriculture

Crop Production

Changes in chlorophyll content can occur as a result of nutrient deficiencies, exposure to environmental stress, exposure to certain herbicides, and differences in light environment during growth (shading). Chlorophyll content can be used to manage nutrient optimization programs that both improve crop yield and help protect the environment. Testing for herbicide damage can indicate the need for a change in herbicide selection or application methods; in order to maintain good weed control while having minimum impact on crop health.

Laboratory methods for determination of chlorophyll content are both time consuming and destructive to the sample. Typically a sample must be detached, ground up in a solvent, then assayed in a spectrophotometer. A sample can be measured only once precluding the monitoring of trends in chlorophyll content over the growing cycle. The CCM-200 provides non-destructive, rapid measurements with auto averaging calculations of relative chlorophyll content. It reduces the need for time consuming and costly chemical testing



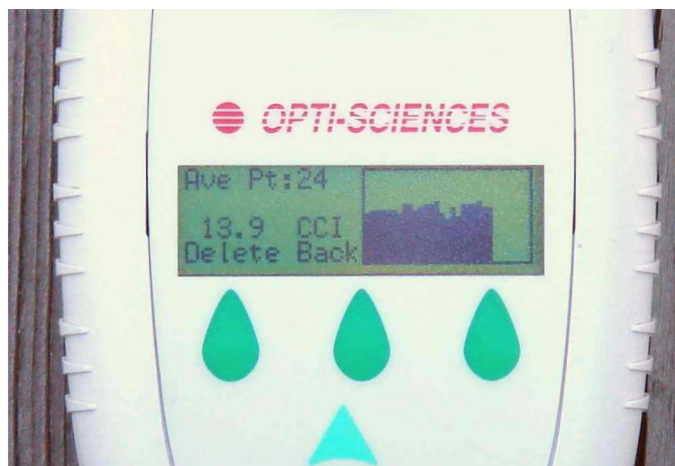
The CCM-200 *plus* accounts for both chlorophyll transmittance and leaf thickness.

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## Technical Specifications

**Measured Parameters:** Optical absorbance in two different wavebands (653 nm and 931 nm). Designed to measure chlorophyll content and compensate for leaf thickness

**Measurement Area:** 3/8" diameter circle, (0.71mm<sup>2</sup>)

**Resolution** +/- 1 CCI Unit

**Repeatability** +/- 1%

**Source:** (1) Medical grade LED (peak at 653nm)  
(1) Infrared LED (peak at 931 nm)

**Detector:** Silicon photodiode with integral amplifier for absorbance measurement and source power monitoring for temperature compensation

**Storage Capacity:** between 94,000 and 160,000 measurements

**Modes:** Single point measurement, or selectable averaging from 2 to 30 samples. Standard deviation is available for 10 samples or more.

**User Interface:** 128 x 32 pixel display, 6 keys for control and data manipulation, beep signal for status and warnings

**Output:** USB 1.1 and RS-232 interface for data transfer. Either entire measuring files, or single measurements can be output by selection.

**Temperature Range:** 0-50 Deg C

**Temperature Drift:** Temperature compensated source and detector circuitry for minimum drift over full range.

**Power Source:** 9V Alkaline Battery