

A COMPARISON OF CHLOROPHYLL METERS ON WHEAT: OBSERVER VS. SPAD

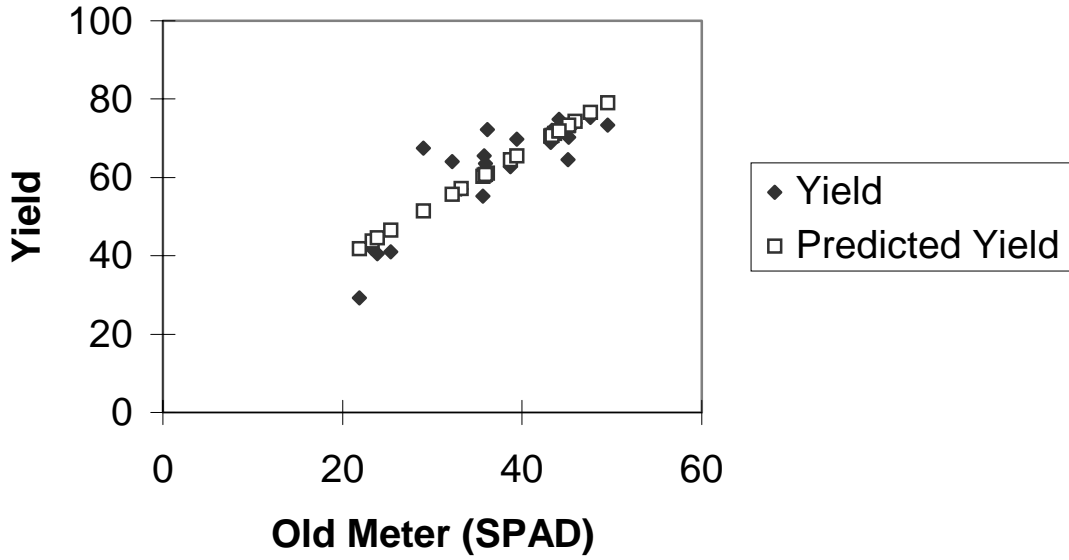
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There is a new chlorophyll meter available on the market. This meter, named the Observer, measures the reflectance of the chlorophyll wavelength from the crop canopy. This is a different method than the SPAD 502 chlorophyll meter uses. The SPAD meter has been on the market several years and measures the absorption of transmitted light on a very small part of the leaf. The SPAD meter has been researched on several crops. The research on wheat was accomplished in Kentucky and results in a specific formula for nitrogen recommendations at Feekes 5 or 6 based on the readings of the SPAD meter.

The new Observer is much easier to use and much faster when taking measurements, so it offers some definite advantages over the SPAD. So it would be helpful to know the answers to the following questions. Is the Observer as accurate as the SPAD meter and can it be used to make accurate nitrogen recommendations? To answer these questions, a trial using Clark wheat was established in 2001. Nitrogen was the only limiting nutrient on this trial. Nitrogen rates of 0, 30, 60, 90, 120 and 150 lb./ac. were applied in February at Feekes 3. Measurements with both meters were taken at Feekes 5 and 6 but due to a faulty Observer meter, the readings were totally unreliable. The meter was returned to the company and another meter was sent to replace it. At this time, the wheat stage of growth had advanced to the soft dough. This is a late growth stage and because nitrogen is being moved into the grain at this time, chlorophyll and nitrogen measurements on the leaves are usually not recommended. However, there was still a wide range of color differences in the upper leaves. Therefore, a correlation between the two meters was made at this time. Although the "read-out" numbers are different, the correlation between the two meters was quite good ($R^2 = 0.88$). The regression equation is: Observer readings = $-20.6 + (7.65 \times \text{SPAD readings})$.

The plots were harvested for grain yield and correlations were made with each of the meter's readings and the yield. These two correlations were quite good, almost identical. The regression coefficient (R^2) was 0.76 with each meter. These measurements give us some assurance that the new meter (Observer) may be as good as the SPAD meter for relating the chlorophyll leaf content to yield and for making nitrogen recommendations. It must be remembered that this work was done at the soft dough stage which leaves a question as to how well the results will relate to Feekes 5 and 6 stages of growth.

Old Meter Line Fit Plot



New Meter Line Fit Plot

