

Paul C. And Edna H. Warner Agriculture Endowment Fund for Sustainable Agriculture

Report Form

Project Title: Development of a Stand Assessment Decision-Support Tool for Small Grain Farmers in Ohio

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Summary: (Describe your project, its objectives and results in one or two sentences)

Fractional Green Canopy Cover (FGCC), measured with the Canopeo smartphone app, was used in the spring to assess barley and wheat stand and predict yield. FGCC was a better predictor of grain yield ($r= 0.56$) compared to manual stand counts ($r=0.50$).

What was done? (One paragraph describing the goals, experiments and how they were performed)

The project goal was to correlate barley and wheat yield with FGCC. Five barley and five wheat fields were selected across a wide geographical range in Ohio for the on-farm trials. Stand count and FGCC measurements were collected at Feekes 5 growth stage from over 25 sampling points per field with combine yield monitor data supplied by the farmer at the end of the season.

What were the results? (One paragraph on the outcome of the experiments, what was learned from them)

The correlation between stand counts and FGCC was higher in barley ($r = 0.91$) whereas in wheat, while significant, was lower ($r= 0.44$). Current barley yield (Fig 1) had a higher correlation for FGCC ($r= 0.56$) compared to manual stand counts ($r=0.50$). 2019 was a tough year for small grain crops due to increased plant stand variable in a fields but FGCC allowed us to be more confident in our yield predictions.

How have the results contributed or will they contribute to sustainable agriculture? (One paragraph on how will farmers uses this research information and what difference will it make on their farms.)

The results of the experiment allow farmers to estimate wheat and barley grain yields early in the spring to make agronomic decisions related the crop's economic viability. Farmers reduce labor, time and errors in conducting manual stand counts using FGCC technology, providing a consistent method of determining yield. The user-friendly mobile app, Canopeo, will allow farmers to be confident and clear in their agronomic decisions.

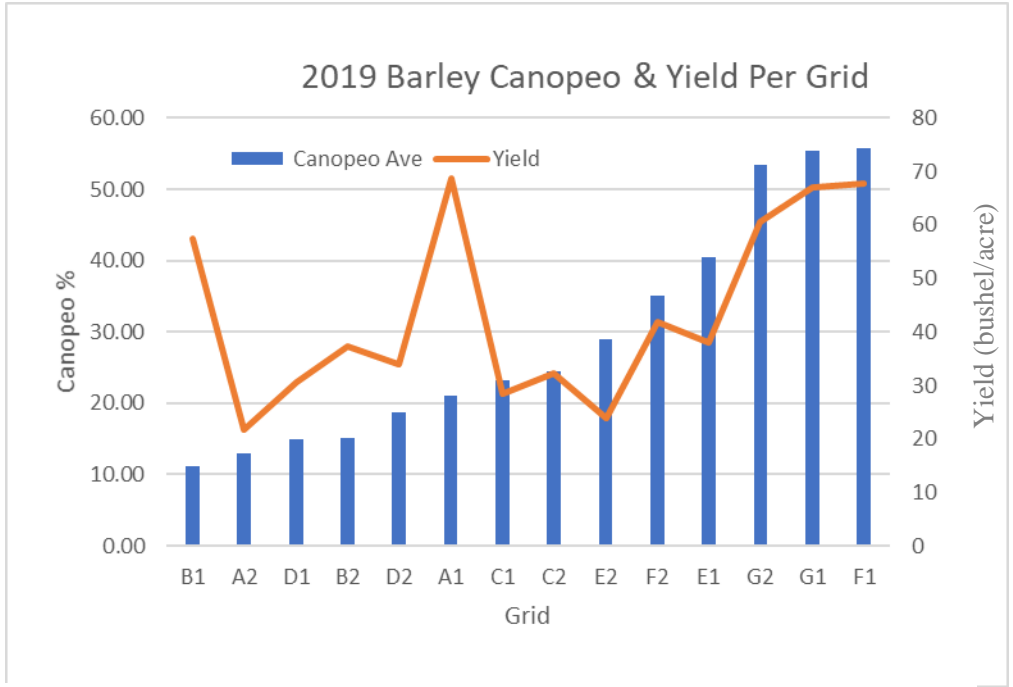


Figure 1: 2019 Barley Canopeo (FGCC) percentage and yield.