When is Canopeo the Right Assessment?

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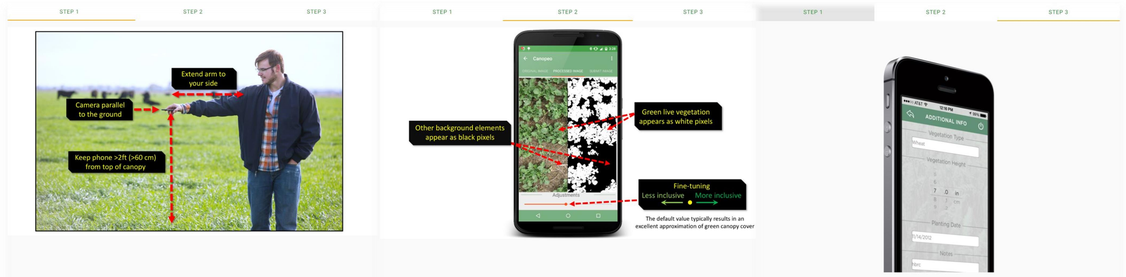
What is Canopeo?

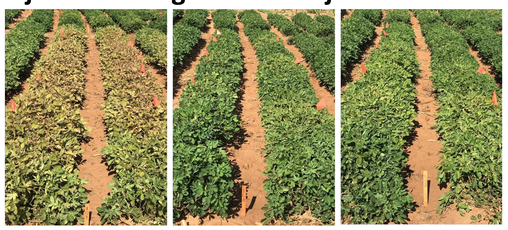
- Smartphone app developed by Oklahoma State University, originally as a data-based tool for assisting in wheat pasture grazing management
- Measures % of green pixels in phone camera image

How do I use Canopeo?



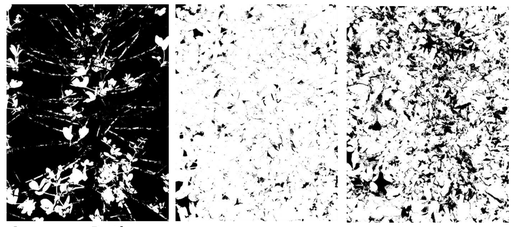
What are the possible advantages to Canopeo?

- Convenient digital/smartphone platform
- Objective rating tool vs subjective visual ratings



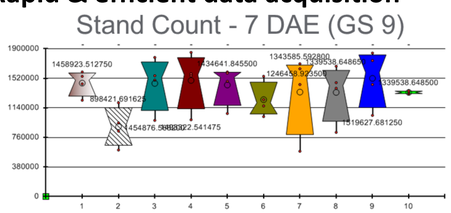
Spider mite visual damage
CV=16.5%, after transformation

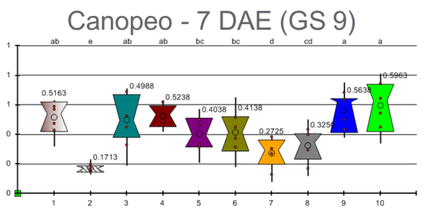
VS



Canopeo Rating
CV=7%, no transformation required (Vandiver peanut trial)

- Rapid & efficient data acquisition





Stand took 2 hrs to collect (w/ GA)

Canopeo took 30 min to collect (alone)

(Lindenmayer wheat trial)

- Enables precise & consistent measurements

Image #1
Canopy
Min = 15
Max = 42
Mean = 29.08
CV = 27.98%

n=12

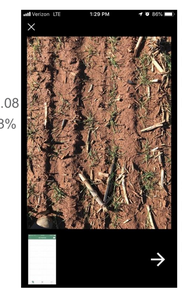
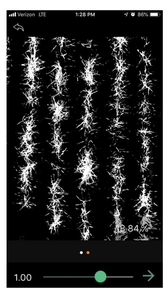
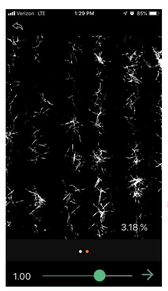


Image #2
Canopy
Min = 1
Max = 10
Mean = 4.83
CV = 53.62%

STARED
Min = 66.7
Max = 95.0
Mean = 83.3
CV = 9.48%

2019 CPFD Scientist Visual Ratings





=Δ77.02%

Canopeo Analyzed Images (Lindenmayer wheat trial)

What are the possible limitations of Canopeo?

- Relies on proper operation by user
  - Requires consistent:
    - Light conditions (i.e. shade vs full sun; confounded by reflectance)
    - Height (i.e. to maintain uniform sample area)
    - Angle (must be ~parallel to ground; i.e. bird-s-eye view)
    - Uniform stand/species (confounded by non-target plant species)
- Functionality of phone in the field (i.e. overheating issues)
- Lack of an efficient way to "batch" process images
- Capable of detecting differences beyond what is biologically meaningful
- Suited to some cropping systems better than others (i.e. drilled vs row-crops)

What considerations should be made before using Canopeo as an assessment in a protocol?

1. Do I expect a trt difference in % green area? (i.e. canopy coverage)
   - No → Choose a different assessment
   - Possibly ↓
2. How will Canopeo affect my sample size? (i.e. whole plot/row vs ~15 sq ft/image)
   - < → Choose a different assessment
   - ≥ ↓
3. Can I manage confounding factors? (i.e. light, height, angle, weeds, etc…)
   - No → Choose a different assessment
   - Yes ↓
4. Will Canopeo save time and/or reduce labor?
   - No → Choose a different assessment
   - Yes ↓

Canopeo may be the right assessment

Final thought…

If Canopeo use is advisable, consider new & creative options to analyze & present the data