



# **CI-100 Digital Plant Canopy Imager**

# CI-100 series...



**CI-110** for Tree Canopy Analysis



**CI-120** for Grass Canopy Analysis



24 PAR Sensor Wand Ceptometer

Carry  
Case



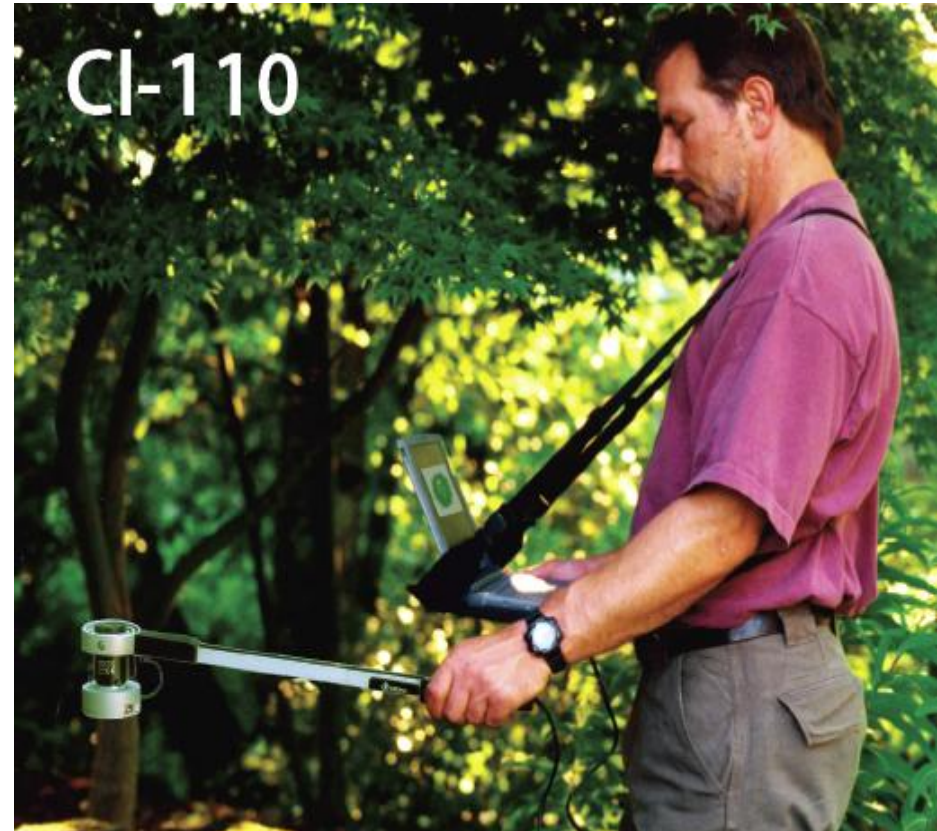
Hand held touch pad  
computer with software



# CI-100 series...

... has advantages over competitors:

- Measures LAI, PAR, sunflecks, leaf angle, canopy extinction coefficient
- LAI and Ceptometer in single unit
- External PAR sensor and uniform sky conditions **not** needed
- Flexible software to adjust images
- GPS link to Google Earth



# CI-110 Accuracy

**Aim:** To measure LAI of tree sapling in a farm paddock

## Methods:

Species: *Eucalyptus amplifolia* (Cabbage Gum), approximately 1.6m tall

Estimated LAI: CI-110 Canopy Imager

Measured LAI: All leaves harvested from sapling and measured using CI-202 Portable Leaf Area Meter; projected ground area measured with tape measure around base of plant. LAI calculated as leaf area divided by ground area.



Scale = 50cm



# CI-110 Image with Unwanted Influences

Unwanted influences in image

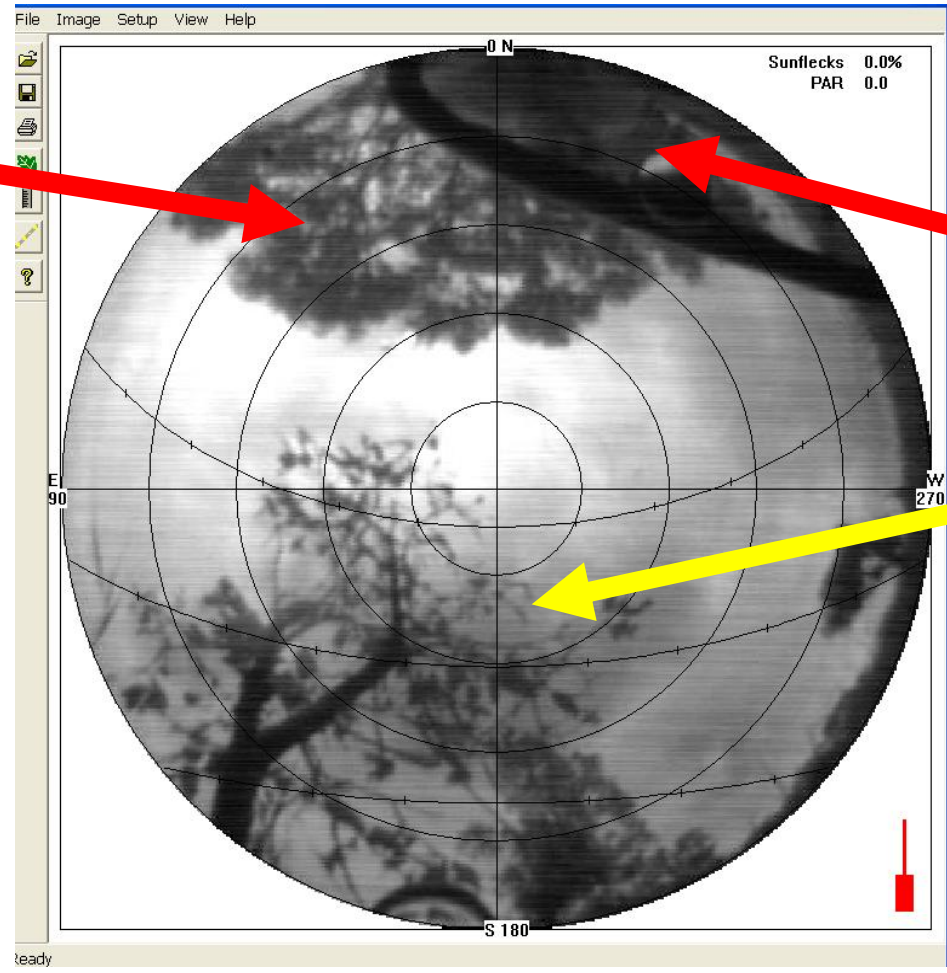
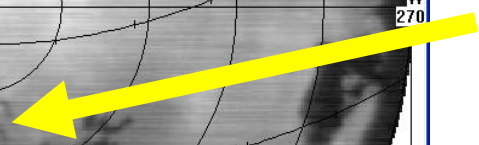
Neighbouring tree



Researcher in image



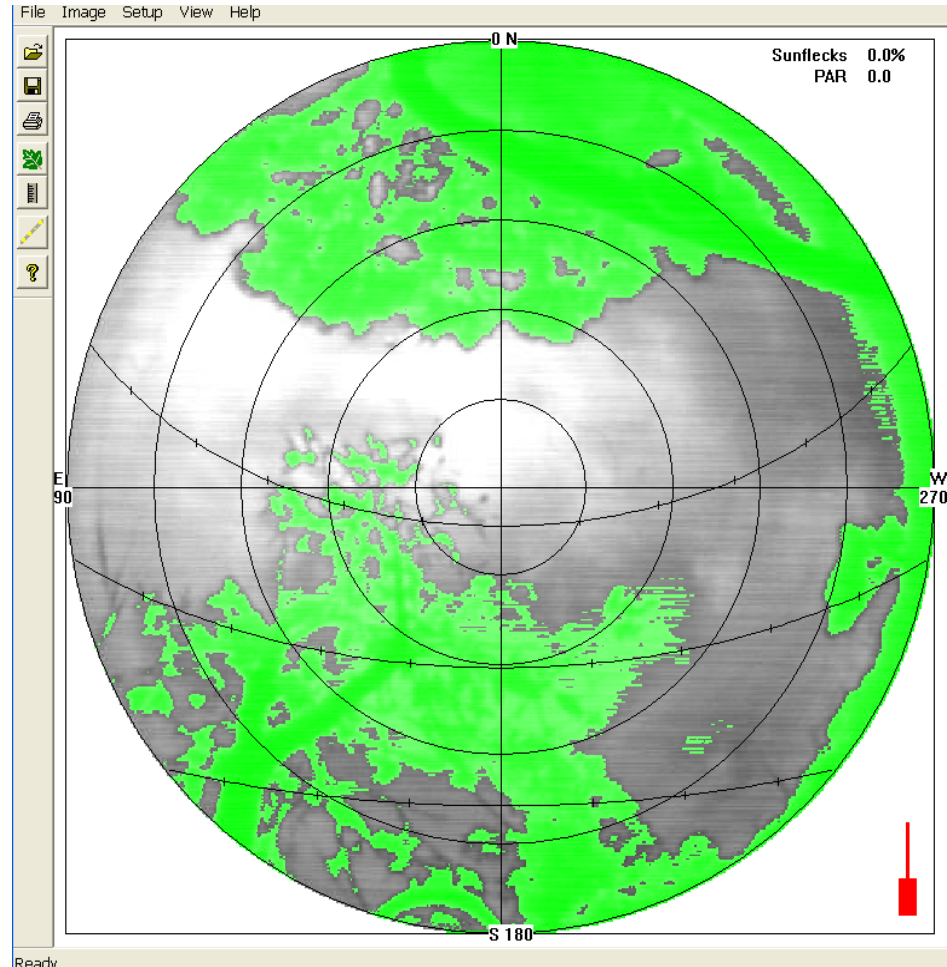
Target canopy



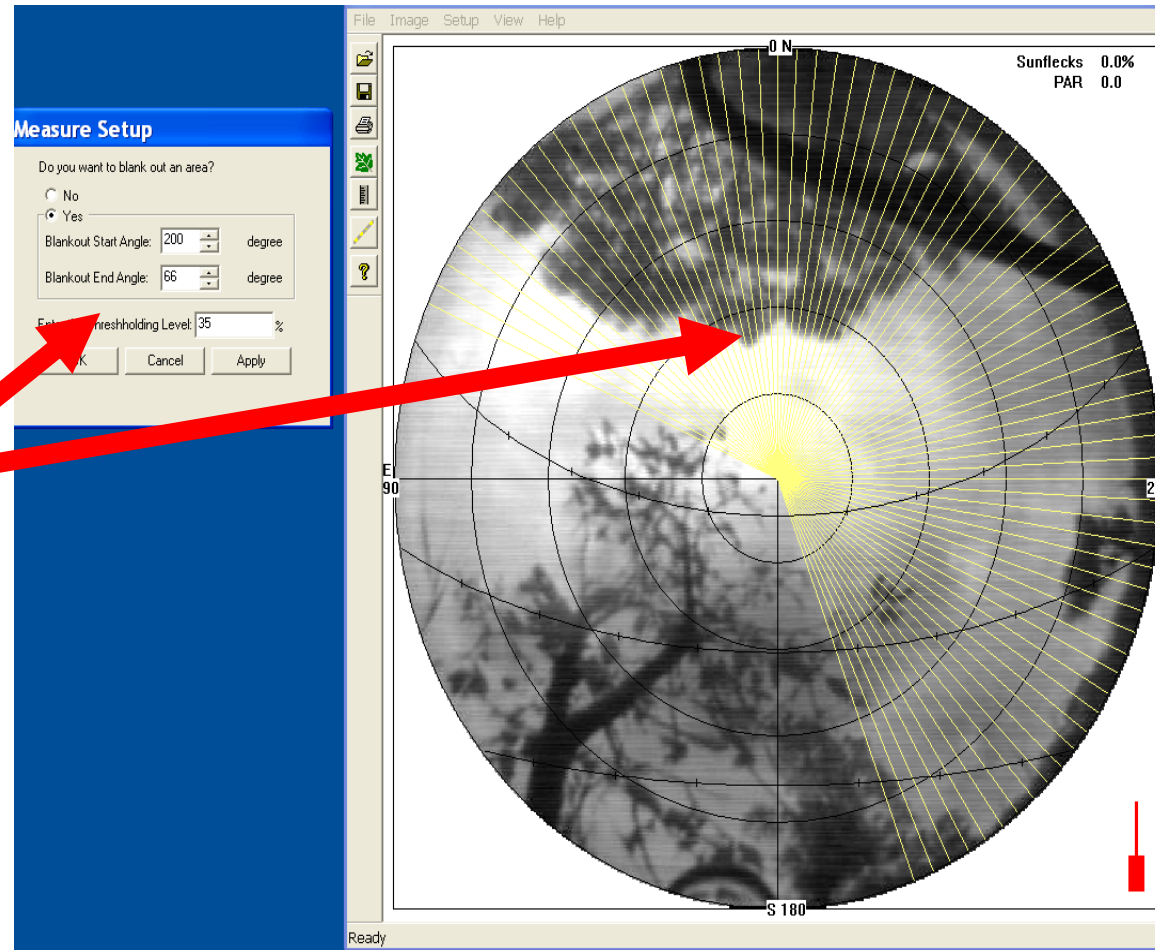
# CI-110 Incorrect LAI Calculation due to Unwanted Influences

Estimated LAI  
(from CI-110):  
0.618

Measured LAI:  
0.326



# CI-110 Capable of Removing Unwanted Influences

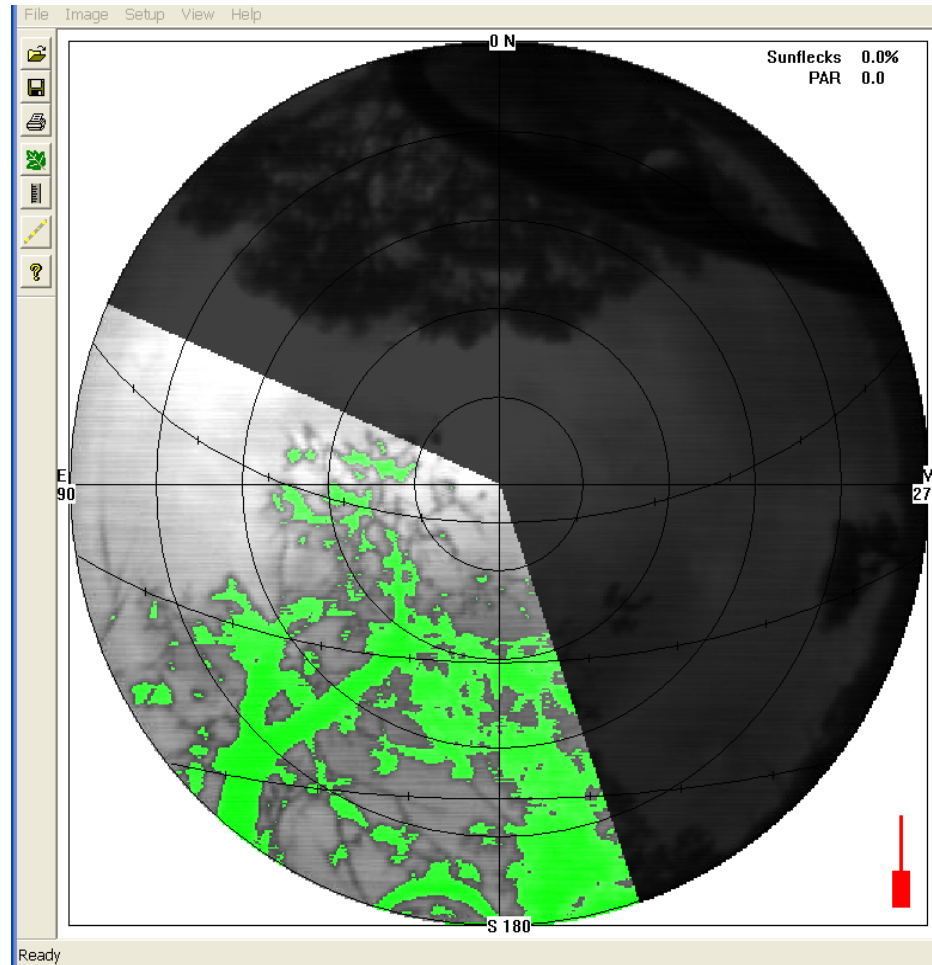


CID software capable of image manipulation to remove unwanted influences such as neighbouring trees, researchers or excess sky

# CI-110 Correct Calculation of LAI

Estimated LAI  
(from CI-110):  
0.320

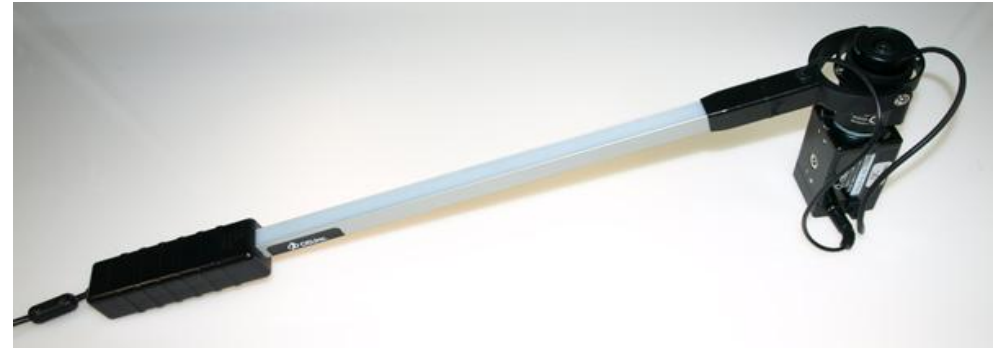
Measured LAI:  
0.326





# Summary

- CI-110 highly accurate measurement of canopy LAI
- Image manipulation allows user the flexibility of measuring specific canopies
- CI-110 can measure plantations and vineyards where excessive sky or neighbouring canopies can cause measurement errors



**CI-110** for Tree Canopy Analysis

# CI-120 Accuracy

**Aim:** To measure LAI of a weed species growing amongst grass and trees in a farm paddock

## Methods:

Species: *Solanum nigrum* (Blackberry), approximately 0.3m tall

Estimated LAI: CI-120 Canopy Imager

Measured LAI: All leaves harvested from sapling and measured using CI-202 Portable Leaf Area Meter; projected ground area measured with tape measure around base of plant. LAI calculated as leaf area divided by ground area.



Scale = 10cm

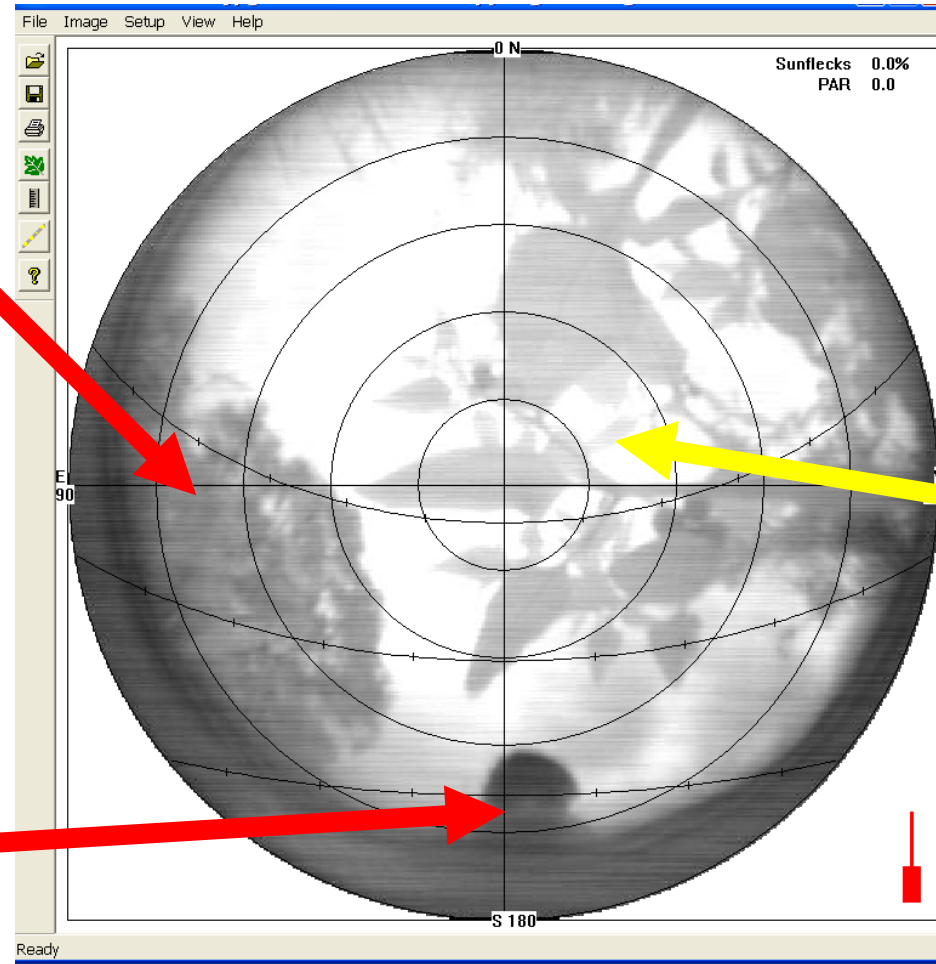


# CI-120 Image with Unwanted Influences

Neighbouring tree

Unwanted influences in image

Researcher in image



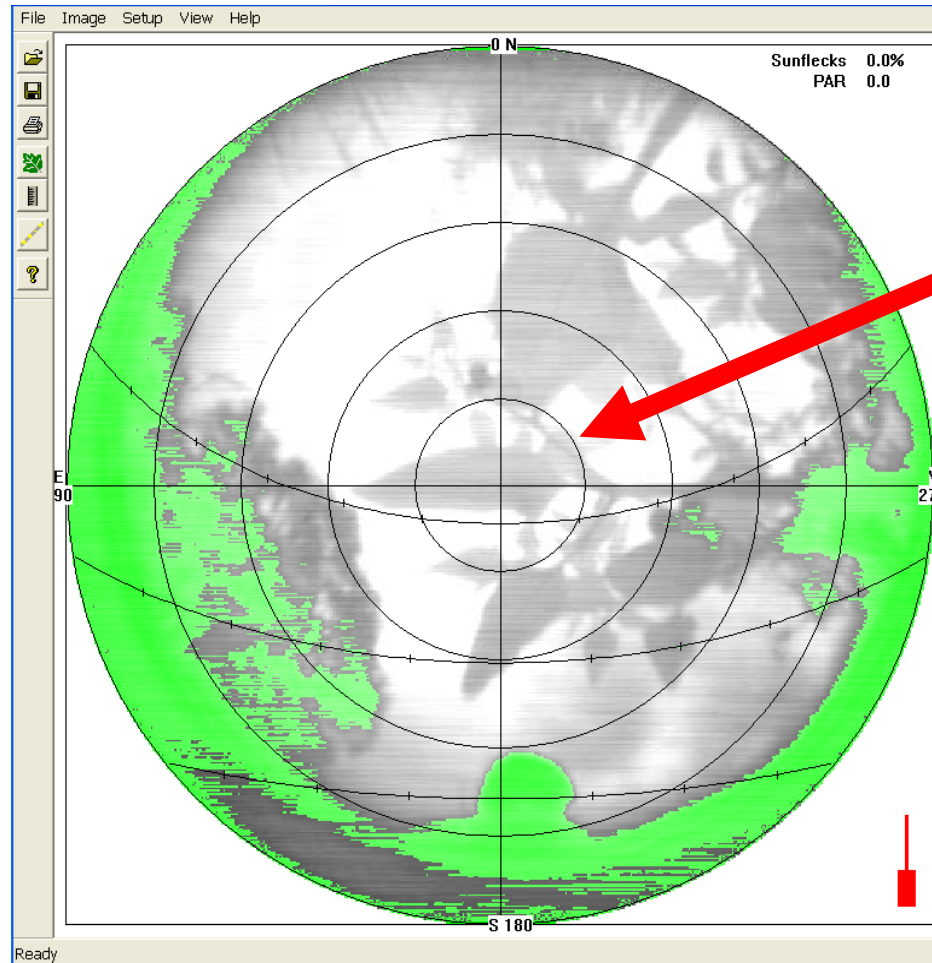
Target canopy



# CI-120 Incorrect LAI Calculation due to Target Canopy not Measured

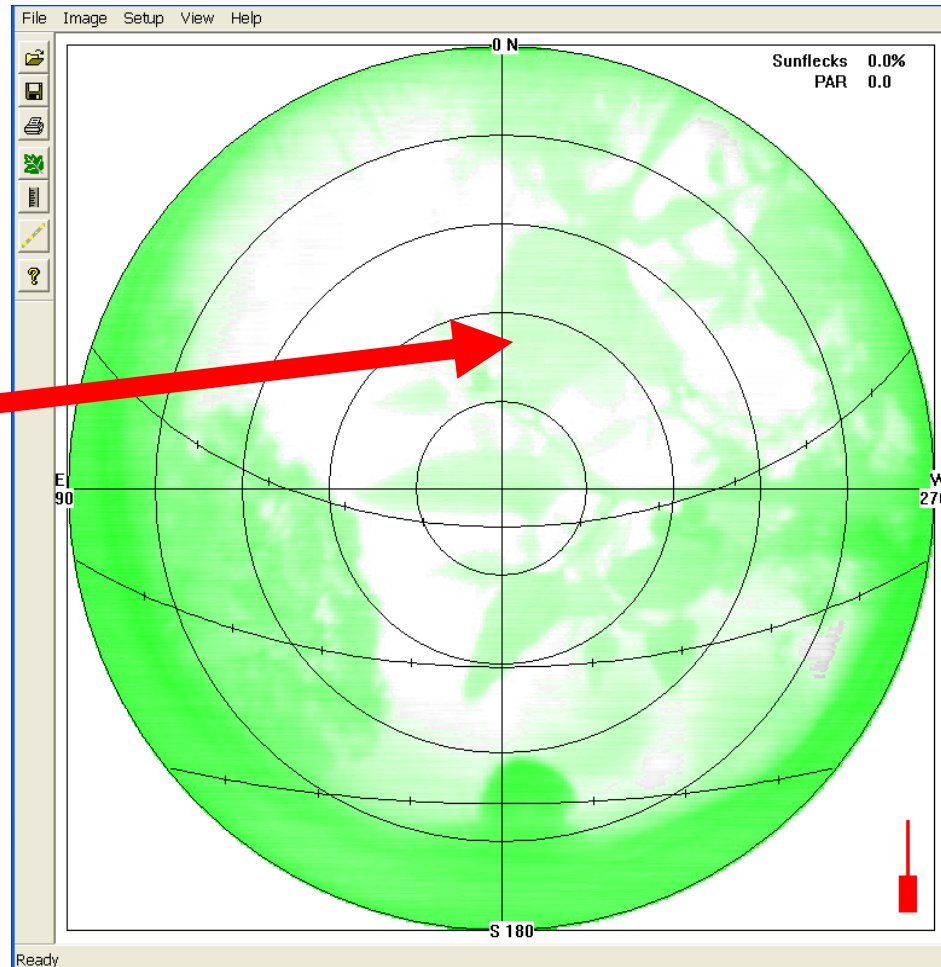
Estimated LAI  
(from CI-120):  
0.364

Measured LAI:  
0.602



Target  
Canopy  
Not  
Measured

# CI-120 Change Threshold Settings in Software to Capture Target Canopy



CID software capable of image manipulation to change threshold value in order to capture entire Canopy of target species.

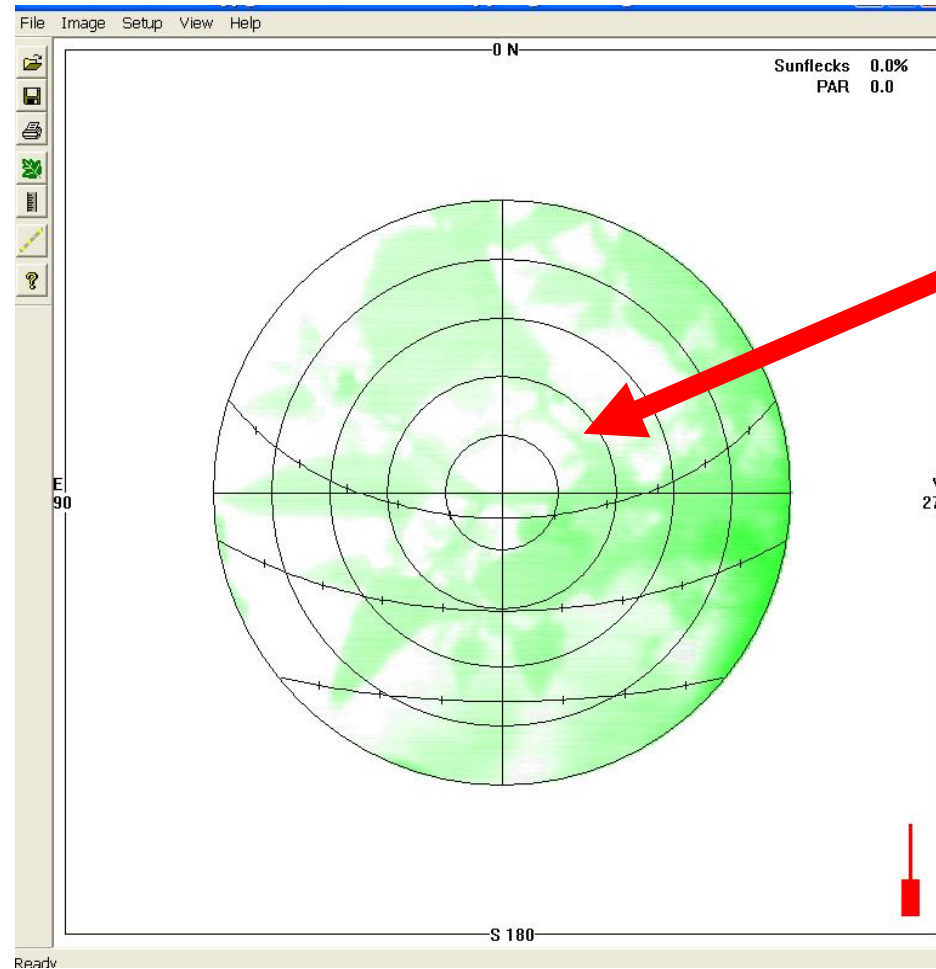
**Threshold changed to 95%**  
**LAI now estimated as 1.264**

Use software to remove unwanted influences in image

# CI-120 Correct LAI Calculation Following Image Manipulation

Estimated LAI  
(from CI-120):  
0.595

Measured LAI:  
0.602



Target  
Canopy  
Measured

# Summary

- CI-120 highly accurate measurement of low lying canopy LAI such as small shrubs, grasses and crops
- Image manipulation allows user the flexibility of measuring specific canopies
- CI-120 can measure targeted areas, particularly on a small scale, which other LAI instruments cannot handle



**CI-120** for Grass Canopy Analysis



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