

APTUS

(Analyzing Plant Traits Using Smartphones)

“Look Deeper into Plants”

Why use APTUS?

Monitoring plant growth and stress visually may not be accurate and/ or feasible. APTUS enables rapid estimation of plant growth and stress, provided images are taken properly

What can you measure using APTUS?

The current version of APTUS allows you to estimate the canopy area index, stress index, and seedling count. The ‘canopy area index’ shows the extent of green area relative to the size of the ‘processed’ image (which can be different from the ‘captured’ image). It can be used to track percent change in growth over time. The ‘stress index’ is an approximation of stress levels (e.g., from low levels of nutrients) experienced by plants, and ‘seedling counts’ can be used to quickly estimate the number of starting plants or germination. APTUS data is more useful for tracking plant growth and stress levels over time, although one can use the app to get information on any given day. The app should be used ONLY on green leaves. Images of plants or parts with other colors will not be processed by APTUS. Images with overlapping leaves should be avoided for seedling count.

Where can you make APTUS measurements?

APTUS can be used both indoors and outside under natural sunlight. Use APTUS as many times as you want while your license is active.

How can you collect good images for APTUS?

Height: A smartphone must be placed at the same height (recommended 45 - 60 cm or 18 - 24 inches) above the top of the plant each time an image is captured. Make sure that the entire plant is captured with a background in the image. If the green plant completely occupies the image, then the canopy area index is meaningless. However, the stress index is still useful in this scenario.

Background: A dark (e.g., black or blue) background is preferred for plant images. One can use a black cloth or plastic to cover the surface before taking images both indoors and outdoors. In some instances, background color can affect image processing. See the adjacent pictures for images that are properly and improperly processed. Images with proper processing will not include any background and complete plant appears in the processed image. The data from improperly or partly processed images should not be used. Processed images may appear distorted or altered. This is due to differences in the resolution of devices used to take images and does not affect the process.

Device: Use the same device for capturing images especially if you prefer to track plant growth, stress, and germination rate.

Light: When used indoors, the images should be captured ONLY under white light (e.g., fluorescent lamp). Place the container with the plant on a dark or black surface and capture the image. Avoid bright or white surfaces. While measuring plants grown outside, avoid bright sunlight. Our experience shows that mornings or late afternoons are better for capturing images. Consistently use these times on different days for tracking plant growth and health. Similar to the indoor measurement, a dark or black background or soil is preferred.

