



Photography Challenge: Plant Health Indicators

As part of the ALEPH mission, assessing plant health is critical to the steps towards sustainable plant growth on the lunar surface.

By using photography to document key health indicators such as leaf texture, colour changes, and moisture levels, we can remotely monitor plant conditions. These visual indicators offer valuable insights into stress responses, hydration status, and potential nutrient deficiencies, providing an important step towards longer term monitoring of plants in remote locations, such as the Moon.



The ALEPH project is an Australian payload putting seeds and plants on the Moon.

Useful to know

Knowing the signs of plant health will help you document it through photography

Leaf Colour

Green: Indicates healthy, well-nourished plants.

- **Yellowing:** A sign of nutrient deficiencies, particularly nitrogen, or stress from waterlogging or drought.
- **Brown Spots:** Indicative of localised cell death due to disease, nutrient imbalance, or environmental stress (e.g., excessive heat or salt accumulation).
- **Purple/Red Leaves:** Can indicate phosphorus deficiency or a stress response to cold temperatures.

Veins

Visible Veins: Healthy plants show distinct, even vein patterns.

- **Discoloured or Faded Veins:** Can indicate nutrient imbalances, such as magnesium or iron deficiency.

Structure

Smooth, Plump Leaves: Suggest good hydration and healthy growth.

- **Wilting or Curling Leaves:** Signs of water stress, root damage, or extreme heat.
- **Crinkled or Misshapen Leaves:** Can indicate viral infection or specific nutrient deficiencies (e.g., calcium).

Infection

Clean: Clean fresh leaves and roots free of contaminants

- **White Powdery Spots:** May indicate powdery mildew, a common fungal infection in plants under stress.
- **Black/Brown Mould Growth:** A sign of fungal contamination due to poor air circulation or excessive moisture.
- **Leaf Rot or Softened Areas:** Caused by fungal pathogens, often due to overwatering or humid conditions.
- **Spotted or Discoloured Leaves:** Fungal infections can result in irregular leaf spots, often with a halo of yellow around the spot.



What you'll need:

- This Instruction booklet (check!)
- Small plants or a batch grown from seed. Try selecting specimens that are showing some signs of stress, or create these conditions yourself (e.g., by overwatering/underwatering)
- Camera or smartphone
- Lighting Source* – different colours of lighting can highlight different indicators of plant health
- (Optional) tripod to keep camera/smartphone steady

*Caution: When using lighting sources, ensure they are kept away from water to avoid any electrical hazards. If experimenting with overwatering, be sure to use equipment in a safe, dry area.





Steps

1. Position Your Subject:

- Place the plant on a stable surface in good lighting. Ensure any significant health indicators (e.g., fungal spots, leaf discolouration, or texture changes) are visible.

2. Set Up Lighting:

- Start with soft, even lighting to highlight the plant's features without casting harsh shadows. Try experimenting with different colours of light by using coloured LEDs or cellophane.

3. Focus on Key Health Indicators:

- Use your camera or tap to focus on your smartphone to focus on details like leaf colour, spots, texture or signs of fungal contamination.

4. Capture the Shot:

- Once satisfied with your focus and composition, take multiple images, adjusting the settings slightly with each shot to ensure you capture the best version.

5. Note Down Health Indicators Captured:

- Take note of the plant health indicators you captured in your shots.

Caution: Keep lighting sources a safe distance from the plant to prevent overheating or burns. Allow any lamps to cool down before handling. Ensure your plant is on a stable surface to avoid spills, especially when overwatering or using water for stress experiments. Keep all electronics dry and away from water.

Share your results!



<https://forms.gle/1TcEVCj5fK8bxqwF9>

Share your results by uploading them via the form above or posting them on Instagram with the tag @plantsonthemoonau or hashtag #plantsonthemoon.

Disclaimer: The creators of this project have taken all reasonable measures to ensure the activities are safe and educational. However, participants are responsible for following instructions carefully and conducting all activities in a safe manner. Adult supervision is required for all participants under the age of 15, and for any use of lighting or electrical tools near water