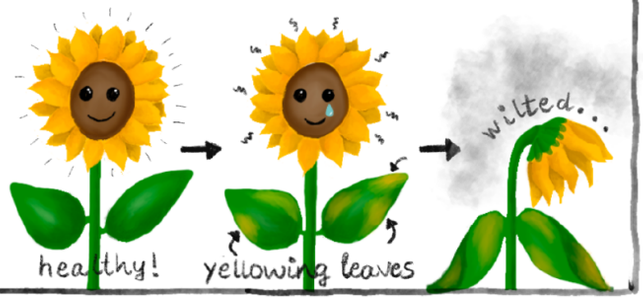
SEEING DROUGHT-AFFECTED PLANTS...IN A WHOLE NEW LIGHT!

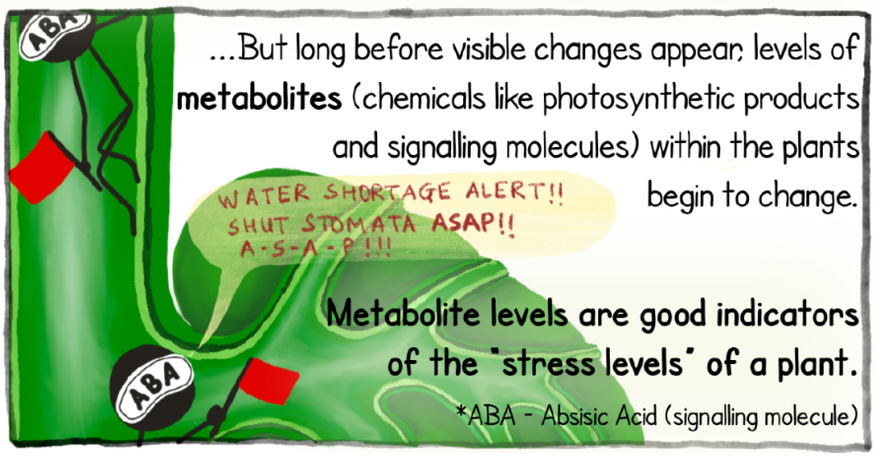
CLIMATE CHANGE IS LEADING TO A HOTTER, DRIER WORLD.

To feed our growing population, we need to find ways to improve the yield of crops under drought...
... and understand **how plants respond to drought.**

Plants in drought conditions start to show visible changes over time...



...But long before visible changes appear, levels of **metabolites** (chemicals like photosynthetic products and signalling molecules) within the plants begin to change.

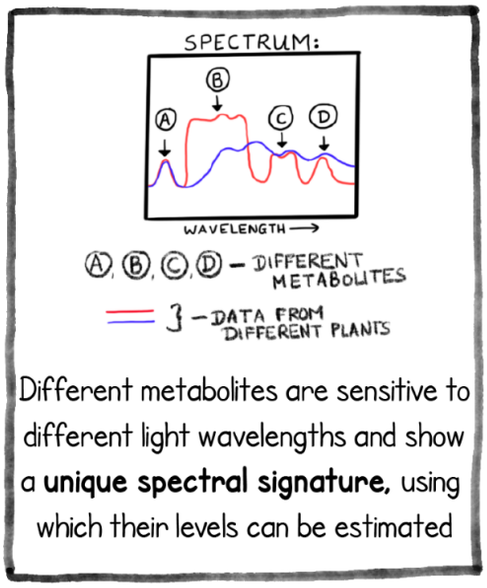


Metabolite levels are good indicators of the "stress levels" of a plant.

*ABA - Absisic Acid (signalling molecule)

Traditionally, metabolite levels were measured by biochemical assays.

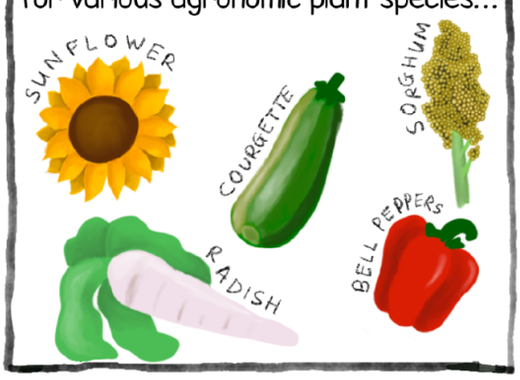
HYPERSPECTRAL LEAF REFLECTANCE SPECTROSCOPY is a **fast** and **non-destructive** way to measure them!



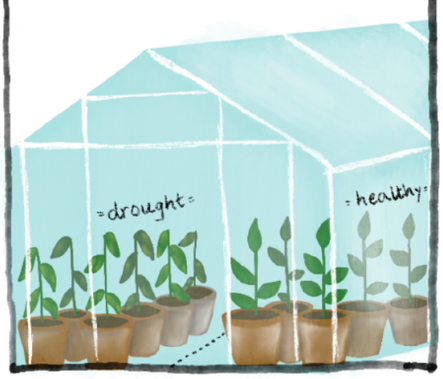
Different metabolites are sensitive to different light wavelengths and show a **unique spectral signature,** using which their levels can be estimated

By using HYPERSPECTRAL LEAF REFLECTANCE SPECTROSCOPY to measure metabolite levels in real-time, we may be able to **detect drought stress BEFORE visible signs show up!**

Burnett and colleagues tried this for various agronomic plant species...



... in glass house conditions...



... and in open courgette fields!

Using this technique, they could reliably measure drought stress in plants **before** visible changes appeared!
This is extremely useful for **monitoring and managing drought stress** in plants.
In the future, it could also be used for **early detection and prevention of drought!**

Article: **Burnett, Angela C., et al. "Detection of the metabolic response to drought stress using hyperspectral reflectance."** Journal of Experimental Botany 72.18 (2021): 6474-6489.
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