Brix Measurement

Ecological Process:

The ecological process involved with this plant metric is **energy flow**, specifically focusing on photosynthesis. Measuring the Brix level of plant sap allows us to monitor how well plants are photosynthesizing. Photosynthesis is the process by which plants convert sunlight into chemical energy, producing sugars that are vital for plant growth and health. Higher Brix values indicate more efficient photosynthesis and healthier plants.

Why Perform This Test:

Measuring Brix gives us a snapshot look at the amount of sugar/dissolved solids in the plant sap. These levels represent the plant's current capacity to convert sunlight into food for themselves and exudates for soil microbes. High Brix levels in plants also deter feeding by many pest species thereby reducing pest pressure. Although Brix levels do fluctuate with time of day and weather conditions, they can provide insight into the status of crops and let us address potential weak areas.

Tools and Materials:

- Soft flannelette cloth
- Distilled water
- Coin (for garlic crusher)
- Garlic crusher
- Refractometer
- Paper/datasheet
- Pencil/pen
- Clipboard
- Bucket/Tote
- Knife

Selecting Samples:

(What To Sample)

- Which plants you choose to sample depend on the question you're trying to answer. If you'd like to get a feel for average Brix in your crop - choose the first fully developed leaves from healthy, representative plants around the growing area.

- You may also be interested in seeing if Brix is lower in apparently stressed or insect-attacked plants.

- It's also interesting to look at the Brix levels across different species in the same field. This can include looking at the various species of your multi-species cover crop or inter-crop, or comparing Brix in your cash crop to the Brix of nearby "weeds".

(How to Sample)

- Ideally, conduct Brix measurements at the same time of day, preferably after at least two hours of sunshine in the morning.
- Conduct measurements immediately in the field. Do not let samples dry out.
- Use a garlic crusher to extract sap from the selected leaves. Twist the leaves and place them in the well of the crusher. If plant material passes through the holes in the crusher, place a coin in the bottom of the well to partly cover some of the holes and create a better crushing surface.
- Roll the samples between your hands or on a hard clean surface for 30 seconds before squeezing to help extract more sap from the leaves.
- Put 2-3 drops of sap on the refractometer prism surface, cover the daylight plate slowly, and eliminate air bubbles.
- Turn the refractometer towards a light source and adjust the focus to read the Brix value.
- Brix is read at the line where color shifts to white along the internal measuring scale.
- A slightly fuzzy line between brightness and darkness indicates better plant health.
- Record the Brix readings on the datasheet provided.
- Note the time of day and environmental conditions during sampling.
- Include observations about the plant's health, any signs of stress, and the specific part of the plant sampled.

(Where to Sample)

- Repeat your measurement at a few locations within the growing area to account for potential variability in soil type, moisture, and fertility.
- Avoid areas with excessive dust (e.g., beside roads). If necessary, wash dust off with distilled water. Make sure to allow the sample to remove extra moisture from sample surfaces to avoid "watering down" your reading.
- Include samples from different areas to compare the effects of field condition, management practice etc.
- Ensure all data is accurately recorded on the datasheet. Don't forget to include the date, time and weather conditions.