

A Deep Dive of Brix

What Is Brix?

Brix is a measure of the dissolved solids (mostly sugars) in a plant, and can be measured using a simple, handheld refractometer. Brix testing can significantly impact your decision-making process. It is important to understand that these readings can guide your deliberations, often leading you in specific directions. However, further testing may be needed to confirm or challenge any conclusions drawn from them.

Facts About Brix

- 1 degree of Brix is equal to 1 gram of sucrose in 100 grams solution.
- Brix changes with temperature.
 - Brix of a cold sample will appear higher than a room temperature sample. (This is why adjusting the refractometer for temperature is important).
- 1 degree change can impact Brix by approximately 0.1 degree Brix.
- Be consistent with testing.
 - Same part of plant, same time of day.
- Nutrients flow from oldest parts of the plant to the newest.
- Manganese is required for photosynthesis and, if manganese levels are low, can affect Brix levels.
- High nitrate levels can diminish other nutrients in soil.
- Phosphorous is required at every plant stage and low available amounts will also affect Brix values.

5 Things You Can Do with Brix

1. Boron Test:

- Measure the Brix level in the morning.
 - If the plant has sufficient boron, the Brix level should be lower due to the release of root exudates overnight.
- Measure the Brix level in the afternoon from the same sample site.
 - Assuming it's a clear day, the Brix value should increase, indicating effective sugar movement.

Boron helps transport sugars within the plant. If the Brix value did not increase, this may indicate a boron deficiency that's hindering the movement of sugars.

2. Potassium Test:

- Obtain a Brix reading from both the top and the bottom of the plant.

- Compare the results of the top and bottom reading.

If you observe a significant difference, this may indicate a potassium deficiency. This is because potassium is crucial for the transport of sugars created during photosynthesis.

3. General Plant Nutrition Test:

- Test the cash crop plant.
- Test the closest weed to the plant.

If the Brix level in the weed is higher than the Brix level in the crop plant, this indicates that the weed is better adapted to the current growing conditions in the field and the crop may be suffering from nutritional issues. Consider what aspects of the weed may be giving it the competitive edge over the crop and what you could do to amend the field habitat in favour of your crop.

4. Foliar Application Effectiveness Test:

- Test plant before applying foliar spray.
- Apply foliar spray.
- Wait for at least 2 hours.
- Retest plant.

If the foliar spray is effective, you should see a rise of 2 degrees or more in your Brix reading.

5. Nitrate Test:

Test the Brix of the crop. If the Brix is three or lower and you observe a sharp line, this may indicate a high concentration of nitrates in the soil. This could also correlate with low calcium levels. A fuzzy line suggests better mineral density and adequate calcium levels, as calcium is essential for transporting minerals within the plant. Conversely, if Brix is above three and there is a sharp line, this typically indicates the plant nutrients are balanced and sugar conversion is adequate.

Measuring Brix in Annuals and Perennials

Brix in annuals rises at the end of the reproduction phase. This is because annuals only have one chance to reproduce and invest heavily in producing seed, which leads to higher sugar levels.

Brix in perennials lowers at the end of reproductive phase. Perennials manage their energy over several life cycles, leading to lower sugar in each cycle.

Important Brix Insights

- If Brix plummets mid-day for no reason, there may be a major weather event coming.
- Microbial activity plays a crucial role in nutrient cycling, which directly impacts Brix levels.
- High Brix readings contribute to create frost protection.

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- Brix readings change when a plant is in the reproductive stage because the plant prioritizes energy allocation to the reproductive parts of the plant and pulls resources away from leaves. At this time, plants also reduce their root exudates.
 - Low soil humus typically leads to lower Brix readings, especially after extended periods of cloudy or rainy weather. Applying fulvic acid can help mitigate this effect, as it acts like a "second sun," enhancing nutrient uptake and overall plant health.

Conclusion

With a refractometer and a bit of time, it is possible to monitor the health of your fields in real time. Brix is a powerful tool that can provide immediate information that can be acted upon. Utilizing the tests highlighted in this document can provide valuable insights for your soil and your farm.