

## REFRACTOMETER: THE ESSENTIAL TOOL

*The refractometer measures degrees Brix- a measure of the dissolved solids and the sugars produced during photosynthesis.*

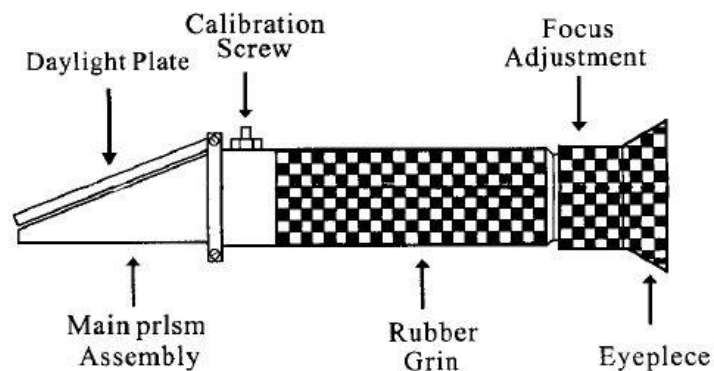
### OPERATING INSTRUCTIONS:

Step 1: Open the daylight plate, wipe the refraction prism carefully with soft flannelette. Be careful not to scratch the surface.

Step 2: Choosing the first fully developed leaves, twist the leaves a few times and then place into the well of a good quality garlic crusher (Zyliss or vice-grips) and then squeezing out the sap. (If plant material squeezes out of the crusher –place a coin in the bottom of the well). You can also roll the samples for 30secs before squeezing-gives a more consistent reading, and a higher reading than a true brix (by as much as 6 degrees higher). *What's important that you always use the same method.*

Step 3: Put 2-3 drops of sap on the prism surface and then cover the daylight plate slowly to let the solution cover the whole prism surface reducing any air bubbles.

Step 4: Turn the refractometer towards a light source or bright place. Turn the focus adjustment until the graduated lines can be seen clearly. The readings of the demarcation line between brightness and darkness indicate the dissolved solids. The blurrier the line, the better. If the line is sharp between bright and dark, this can indicate free nitrates (esp if below 3 brix) and lower food quality.



★ Brix can help determine the suitability of a fertiliser mix. Measure Brix on the crop and a control before application, then re-test 1-24 hours after input. Brix needs to lift by at least 1 point above the control. If it remains the same or drops, then this input can be considered not suitable at this time.

★ Measuring the brix of a plant's sap gives an immediate overview of the general health of a crop at any stage of production.

*Start testing the brix of all your food, including milk. Try comparing purchased fruit and vegetables to the food in your garden. Studies show mineral values in food have fallen by 30-60% since 1940 -This just may be the best tool to get your home garden pumping!*

## BRIX READINGS

- ★ Take at the same time of the day (allowing for at least two hours of sunshine in the morning).
- ★ Take a sample from the same part of the plant (then ensure all subsequent readings follow suit).
- ★ Record your findings!

## MORE ON BRIX

- ★ **Brix levels can vary due to stress** and/or dehydration and once a plant has set flower/seed. This is why it is vital to keep good records and monitor changes in brix and to avoid sampling insect or disease damaged leaves.
- ★ The method of extracting sap can have a large influence on the reading.
- ★ Generally, brix readings will drop with low atmospheric pressure (eg. the onset of a storm).
- ★ Measure your weeds! Your weeds should have a lower Brix level, if not you need to look at why your current programme is favouring weed production. If the brix is higher in your weeds than your crop you may need to intervene to reduce the threat of yield reductions. If the brix is lower in the weeds, you can afford to leave them as the crop will outcompete them in time.
- ★ Brix is lowest at dawn, highest after midday, and is affected by in-coming storms and cloud cover.
  - To prevent brix dropping quickly, use a foliar spray of fulvic acid.
- ★ The lower the humus levels, the faster the brix will drop following prolonged cloudy or rainy periods.
  - Brix levels should be uniform throughout the plant, if not then suspect a soil imbalance
    - P:K ratio is key suspect here
  - Brix should vary through the day as plants move sugars to the roots at night
    - Brix is lower in the morning than afternoon, suspect Boron if not, as this trace mineral is responsible for translocating sugars between roots and leaves.
  - Brix needs to be read with other tools and good observations.

Take good records, during one single day, and across the season to get a true picture of your crops.

For more information contact Nicole Masters  
Integrity Soils. [nicole@integritysoils.co.nz](mailto:nicole@integritysoils.co.nz)

