

**Workshop Title: Brix and Growing Quality Vegetables**

**Speaker(s) & their title(s):** Dan Kittredge, Bionutrient Food Association

**Executive summary**

The premise of Dan's talks throughout the conference were to explain how to improve nutrient content in the food farmers produce, and to simultaneously improve the health of the plants and the soil on the farm by regulating pests and diseases before the onset of problems. In this third segment of his three-part talk, Dan focused primarily on practical tools that can be used on the farm to monitor soil and plant health, and how to use them. For more background, refer to the notes from *Nutrient Density Crops, Part 1&2*.

**Detailed Notes**

The bottom line: How do I make a livelihood, without working all day? Healthier plants will mean you will do better on the farm, and your plants will do better too.

Plant health should be at the forefront in order to increase nutrient content and quality of crops, and right now it's not. Farmers should be using tools to monitor nutrient content in crops before they go to the market and reach the consumer. We have lost skillsets in problem identification. We are trained to be more analytical about problems, rather than intuitive. These tools will help us to track potential problems before the onset of symptoms.

**Brix and refractometers, soil conductivity meter:** These tools would allow us to be more proactive about what's going on with plants, before infestations and onset of diseases.

**Brix:** refractometer unit of measurement

- ⤴ An Austrian chemist from the 1830s, Brix, was first to test grape quality for vineyards. Which grapes turned to wine, and which would turn to vinegar? Using specific gravity Brix was able to figure it out.
- ⤴ Since then, people working with wine and honey have used refractometers to measure quality.
- ⤴ Can find on eBay for ~\$20
- ⤴ Dan's organization suggests using refractometers to test vegetable crops for nutrient content and quality. This is the best tool available so far for determining a market standard for quality. Since the Brix meter can be cheated, his organization is working on a new tool (in need of further research to develop a data set for the tool)

**Using brix readings for crops**

- ⤴ Amount of dissolved solids in the plant leaf
- ⤴ Test a drop of liquid extract from a leaf
- ⤴ Want a brix reading of 12 in the leaf as the crop is growing
- ⤴ Test crops first thing in the morning on a regular weekly basis, take at the same time of the week/day ---expect the readings to fluctuate based on the amount of sunlight

- ⤴ Always test the 4<sup>th</sup> newest leaf
- ⤴ Expect fluctuations as the plant starts to develop a fruit set
- ⤴ If brix reading is not fluctuating this is an indicator of a boron deficiency

### **Electrical conductivity**

- ⤴ Hanna DIST3 w/probe -soil conductivity meter
- ⤴ Tests how many ions are present in the soil solution—indicates how many nutrients are present in the soil that are available to the plant
- ⤴ Unit is micro- or milli-siemens
- ⤴ 1000 is too high
- ⤴ Expect soil conductivity to increase as plant grows---plants should be producing sugars and excreting them through the roots into the soil
- ⤴ 2-3 inches depth for sampling
- ⤴ If reading is zero it means that soil isn't moist enough

ALWAYS ensure adequate water for crops to manage nutrient uptake. Irrigate with 3 lines of drip tape in every 4 ft bed. Water is critical.

What research needs to be done:

- ⤴ Brix is poorly researched; on the 'fringe' for conventional agriculture
- ⤴ Lack of interest, resources to push for research in brix
- ⤴ A big interest on the part of the audience (by show of hands) on developing more research for brix