

## **Brix and Pest Pressure**

### Shifting Perspectives

Often in regenerative organic agriculture, we have to shift our thinking from how we grew up and how our experiences built our mindsets. We often look at pests as creatures that serve no purpose other than to destroy our food sources. One of the hardest things we must do is understand the rhythm of life and our role within it. In this document, we will explore the role that measuring Brix takes on in the relationship between pests and plants.

“Insects only feed upon food that is considered unfit, nutritionally poor, dead or dying.”

- Dr. Thomas Dykstra

### What Do Insects Do?

As stated above by Dr. Dykstra, the plant feeding insects that we often consider pests perform an important function in nature – to remove weak plants from the gene pool. Healthy plants are unpalatable to these insects while unhealthy plants are much more palatable. Not only are unhealthy plants tastier to pests, they also often (unintentionally) send out chemical cues into the environment that draw more “pest” insects to them. If this is the case, how can we determine if our plants are healthy? The quickest way to get a good idea of whether the plant is healthy or not is by testing the sap for its sugar content using Brix.

### How to Measure Brix

We can measure the Brix value by using a refractometer. The process is very simple:

1. The sap is extracted by crushing plant material in a garlic press or similar device.
2. The sap is placed on the refractometer’s prism surface using a pipette, and then the refractometer lens is laid overtop of the prism surface to spread the sap.
3. Hold the refractometer up to the light and look through the eyepiece.
4. Inside the refractometer, you will see a little “ruler”. As the light passes through the sap, it creates a color change along the ruler which will tell you the Brix value of the plant.

### When Should You Take Brix Measurements?

Brix readings will change throughout the day and with changes in weather. You can expect your highest numbers during or right after peak photosynthesis times when sugar production is at its max in the plant (afternoon or sunny days).

### Here Are Some General Brix Value Markers:

- **1-2 Brix:** Unhealthy plants that require force feeding to survive.
- **3-7 Brix:** Plants have a fighting chance but are not doing great.
- **8-12 Brix:** Plants can now protect themselves. Water retention abilities increased.
- **12+ Brix:** Objectively healthy plants. High nutrient density and basically pest free.

### At What Brix Value Do Insects Lose Interest?

- Aphid Group: 6-8 Brix
- Sucking Insects: 7-9 Brix
- Chewing Insects: 9-11 Brix
- Grasshopper Group: 10-12+ Brix

### What Factors Increase or Decrease Brix Measurements?

#### **Increase:**

- **Sunshine:** Photosynthesis is key, as well as plant density that doesn't shadow crops.
- **Water:** Enough for life to flow and not drown.
- **Air:** Soil that is not compacted will allow good air circulation.
- **Nutrients:** Good microbial activity is key.

#### **Decrease:**

- **Herbicides, Fungicides, Insecticides:** These chemicals all kill microbes in the soil which will lower the Brix.
- **High Salt Fertilizers:** Force feeding plants with fertilizers will result in lower Brix.

### To Conclude:

Brix is a good starting point to determine the health of plants. If you discover that there are still issues after finding a high Brix value, a foliar sample to a lab may be in order. There is a great deal of information available on the topic and if you find yourself wanting to learn more, we encourage further study. Changing the way we look at agriculture can be incredibly daunting, but it is worth the effort. Not only is it good for our planet - it benefits future generations.