

## 4.0 SECRET 1 - BRIX & INCREASING BRIX LEVELS

### Building up the Brix for Healthier, Insect-Proof, Disease, Pathogen/Mold Resistant, Nutrient-Dense Crops.

Brix is a unit of measurement to assess any dissolved solids in plant (fruit and vegetable) juices. These solids include amino acids, proteins, minerals, vitamins, and the sugars: fructose and sucrose. It is important to know the brix level (°Bx) of fruits and vegetables to determine and plan soil management practices. It also helps gardeners enhance the soil while determining whether they should increase the organic matter and soil nutrient ratios.

#### Brix may also be known as plant sap analysis.

The higher the brix level in fruits and vegetables, the healthier the plant is. Plants with a high brix level tend to taste better and can be stored for longer periods of time. In fact, high-brix fruits and vegetables do not rot as easily. High-brix plants have been known to produce seeds that germinate quicker, while resisting both frost and heat damage. The best organic farmers often boast about growing nutrient-dense, high-brix plants. But brix is still a foreign concept to many indoor growers. Brix is a measurement of the sugar content in the sap, expressed as a percentage. Generally speaking, the higher the brix, the healthier the plant.

Furthermore, there is a direct proportional relationship between brix and the quality of the finished produce. High-brix plants are healthier, tastier and higher in nutrients than low-brix plants, and brix offers an objective measurement of how well your plants are doing. So if you want to consistently grow the best of the best, taking regular brix readings will help you reach your goal.

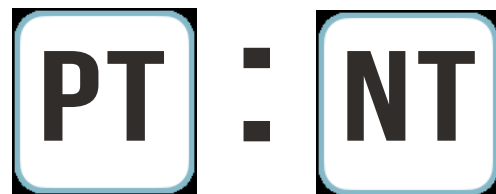
Brix measurements are taken with the aid of a brix refractometer. The more sugars and dissolved solids in a sap sample, the more the mixture bends the light that passes through it. A brix refractometer reads how much the light bends (refracts), and displays the results as a percentage of sugars in the sap. Take a leaf sample, roll it into a ball and squeeze a couple of drops onto the glass slide of the refractometer. Then look through the hand-held device towards a light source, and read the brix number on a graduated scale. If you want an even more accurate measurement, digital refractometers are also available.

### The more efficiently your plants take up water and nutrients, the higher the brix.

Since organic biostimulants improve the uptake of minerals, the judicious use of additives such as amino acids, humic and fulvic acids, and seaweed extracts can help improve brix. The proper balance of minerals in the nutrient solution can also have a positive effect, particularly the potassium-to-nitrate ratio. Here are some suggestions for improving the brix of your favorite crops.

## Increase the Potassium to Nitrate Ratio

Potassium is a catalyst for carbohydrate metabolism, helping to increase brix. A grower has three choices for increasing the potassium-to-nitrate ratio: lower the nitrates, increase the potassium or do a little of both. Once you find the sweet spot, no pun intended, the brix should start to improve. Taking a brix measurement is standard operating procedure for hydroponic crop advisors in Europe. For example, if a leaf sample in a hydroponic tomato greenhouse shows low brix, often the first thing the consultant will recommend is raising the potassium-to-nitrate ratio until the brix reaches the target level. That way, nutrient problems can be avoided before the first signs of deficiency appear. Once visual nutrient deficiencies appear, the plant is already suffering and may not ever be able to reach its true genetic potential. Taking brix readings and making adjustments will help prevent problems before they happen.



Excessive nitrates burn carbohydrates and reduce brix. In fact, nearly 30% of the energy of photosynthesis is used just to assimilate the nitrates. So to ensure high brix, don't give plants more nitrates than they need. Excessive nitrates produce large cells within cell walls, making them a target for pests and diseases. And since the sugars are burned to produce more top growth, root growth can become restricted and fruit and flower production can be delayed. A brix refractometer can show the signs of excess nitrates before it's too late.