

# Enhancing Photosynthesis

With NUE Cal-8, Photo-Stim, NUE 2-17-17 & Carbo Chelate



## Materials

water and nutrients



## Pipeline

stems and branches



## Solar Collectors

leaves



## Storage Bin

Fruit



**Profit!**

## The Basics:

We can reduce agriculture to the most basic functions.

A plant is made up of roots that takes up materials (water and nutrient) to build a sophisticated pipeline (stems, branches). The pipelines are attached to solar collectors (leaves) that take the Sun's light and combine its life-giving energy with CO<sub>2</sub> and water to make energy. Sugar is kept in the storage bin (fruit) that growers get paid to produce.

## Interesting Point:

Not all the processes involved with photosynthesis are understood. Micronutrients play a vital role in photosynthesis. In order to make sugar through photosynthesis, a total of 29 metal ions and 7 aromatic groups are involved in the transfer process. These metals are:

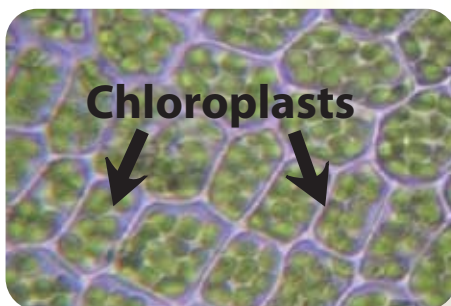
*19 - Iron (Fe), 5 - Magnesium (Mg), 4 - Manganese (Mn) and 1 - Copper (Cu)*

When your fruit crops can use these minerals properly, photosynthesis is enhanced and your profit margin increases.

## Building Blocks of Photosynthesis

The rays of sunlight strike the surface of the leaves of plants and are absorbed by pigments located in the chloroplast.

A square inch of leaf area can contain up to 300,000,000 chloroplasts! Most nitrogen in a plant is found in the chlorophyll molecules of the leaf.



The process of photosynthesis is really one of the most important functions in crop production. Can you measure this process? Can you improve the efficiency of the process? See the other side of this information sheet to see how to measure it yourself and how Bio-Gro, Inc. can help you make your crops more efficient and productive.



- **NUE Cal-8:** 8% Calcium, 35% organic acid, with Glucometasaccharinic Acids.
- **NUE:** Calcium Compatible Micronutrients (magnesium, boron, copper, iron, manganese, zinc)
- **NUE Photo-Stim:** Specific pigment associated enzyme activators.
- **NUE Carbo-Chelate:** Non-Calcium, organic acid solution.
- **NUE 2-17-17:** NPK fertilizer in a base of 12% organic acids with Glucometasaccharinic Acids.
- **Cal-Amine:** 10% N, 6% Calcium + organic acids & amines

## Monitoring Plant Health

Nutrient analysis is an important tool for monitoring plant health status and growth potential. Petiole, leaf and fruit tests should be a part of any fertility monitoring system. However, does the presence of a nutrient in the leaf or petiole truly indicate that it is 'bio-available'? That it is part of the plants growth function?

Another inadequacy in plant tissue analysis is the time it takes to analyze a crop, wait for lab results and then implement a nutrient application.

## Bio-Gro Has a Solution: Test the Products Yourself!

Contact your Bio-Gro, Inc. representative and we can send you samples of products such as NUE Cal-8, Photo-Stim and others that you can test on your crop. The procedure is simple: spray 5-10 plants with the desired products (or several branches in permanent crops), and in 12-36 hours begin measuring the treated areas and corresponding control subjects with a SPAD meter.

The differences in chlorophyll levels typically range from 5% to 20% higher than the control. If several different products increase the reading significantly, try using them in combination.

If desired, continue to monitor the positive treated plants with controls to see how long the effect lasts, this will help choose the most long-term effective products.

### Recommendations:

**Vegetable Crops** – 2-4 applications of 1 gpa of Cal-8, prior to and after bloom. If N is desired, use Cal-Amine in early applications. For longer term effects add Photo-stim.

**Permanent Crops** – 2-4 applications of 1 to 2 gpa of Cal-8, also consider alternating with NUE 2-17-17 in early spring foliars, as well as post harvest foliars. Use Cal-Amine if N is desired.

Always apply with necessary micronutrients: magnesium, manganese, iron & zinc or blends such as Micro 336.

## Using a SPAD Meter:

- ➔ SPAD meters measure chlorophyll
- ➔ The more chlorophyll, the more nitrogen available to the plant
- ➔ Test the same part of the plant and the same part of the leaf
- ➔ Do at least 10 readings in each treatment area and average the number
- ➔ Do control plants as close to the treated area as possible
- ➔ Test plants that are the same size and growth stage
- ➔ In permanent crops, compare the same side of the row

