Enlightened Soil Corp

# En-Soil Algae

## The Natural Path to Enhanced Soil Fertility

**Brief Report: Color Enhancement with Algae**

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# Brief report: Color Enhancement with Algae

**Enlightened Soil Corp**
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**February 8, 2020**

## The Effect of *Chlorella vulgaris* as a Bio-stimulant on Plant Color

Color is a critical element in the marketing of vegetables as well as with turf management. Customers want plants that are vibrantly green. When choosing a fertilizer, golf course turf managers consider color as important as the effect of the fertilizer on growth and on soil.

The green color of plants comes from the pigment, chlorophyll, a group of compounds central to photosynthesis. Chlorophyll-a is the principal pigment, and chlorophyll-b is an accessory, which transfers sunlight energy to chlorophyll-a. In plants exposed to direct sunlight, chlorophyll-a is predominant. The level of chlorophyll-b is higher in plants that grow in shade, such as plants that grow on the forest floor; these plants are a darker green. In addition to the aesthetics, higher chlorophyll content is associated with enhanced plant growth and crop yield.

Color can be quantified in the laboratory by measuring chlorophyll content. A number of studies that tested the effects live algae on plant growth also included measurement of chlorophyll levels. They demonstrated that bio-stimulation with algae or algae extracts raises the chlorophyll content **(Table).**

Most of the cited studies tested the effects of *C. vulgaris*, and En-Soil Algae is a pure culture of *C. vulgaris.* An increase in chlorophyll levels was observed with both soil and foliar application. Hajnal-Nafari found that foliar application had a greater effect than soil application in Swiss Chard plants. When algae is applied to turf, it reaches the soil as well as foliage.

Only one of these studies cited in the Table compared *C. vulgaris* with other soil amendments. Agwa tested Chlorella against synthetic-chemical fertilizer (NPK), and poultry manure. NPK and manure had no effect on chlorophyll levels, even though they promoted plant growth. In contrast, Chlorella raised the level of chlorophyll-a substantially.

**Table:** Chlorophyll content comparing treatment with control. Most of the studies used chlorella vulgaris. Most measured total plant chlorophyll; Agwa tested the chlorophyll content in the okra pods).

Chlorophyll-a / Chlorophyll-b

| Study | Control (no fertilizer) | Algae | NPK | Manure |
|---|---|---|---|---|
| *Taha 2015 Corn (soil application | 3.8/2.70 (Ch-a/Ch-b) | 6.5/3.40 | | |
| Agwa 2017 Okra pods (soil) | 0.09/0.09 | 1.12/0.10 | 0.10/0.10 | 0.11/0.09 |
| Hajnal-Jafari 2020 Swiss Chard (foliar or soil application) | 0.001 / 0.39 | 0.33 (foliar) 0.13 (soil) / 0.53 (foliar) 0.40 (soil) | | |
| Faheed 2008 Lettuce (soil, before sowing) | 0.202/0.089 | 0.371/0.089 | | |
| *Puglisi 2020 Lettuce (soil) | 0.46/0.18 | 0.74/0.18 | | |

*Taha 2015 used two different Chlorella species, (c. oocystoides and c. minutissima), and Puglisi 2020 used an extract of Scenedesmus quadricauda, a green algae whose effects on growth were similar to those of *Chlorella vulgaris* in her previous studies.

**References:**

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