

CARBONIZER' Affect on Microorganisms in soil<sup>1</sup>  
Millions per gram of soil

	CARBONIZER	Fertilizer	Compost
Total Bacteria	89	77	46
Actinomycetes	120	81	40
Fungi	6	4.5	3.9
Nitrogen Fixers	94	43	24
Total Anaerobe	52	25	7.6
<b>Total</b>	<b>361</b>	<b>230.5</b>	<b>121.5</b>

1= University of Arizona, Arizona Citrus Agricultural Center

CARBONIZER' Affect on Microorganisms in soil<sup>2</sup>  
Millions per gram of soil

	Pre application	Post application
Total Bacteria	36	270
Actinomycetes	1.4	1.6
Fungi	.17	.10
Nitrogen Fixers	20	43
Total Anaerobes	5.4	13
<b>Total</b>	<b>63</b>	<b>327</b>

2 = BBC Laboratories, Soil source Mettler, CA.

**CARBONIZER**

Liquid, ease of use  
Balanced nutrition  
Compatible with fertilizers  
Increased performance  
Inexpensive in-field humus  
Non chemical

Vs.

Organic matter Alone  
Slow release  
Difficult to apply  
Average productivity  
Fixed performance  
Expensive pre-composting

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**Carbonizer**<sup>TM</sup>

Carbohydrate based plant food

**Turf Grass  
Formulation**

*Liquid Compost  
Root Zone Ammendment*

## Carbohydrate based plant food

**“BioScientific’s *Carbonizer* is a liquid carbon containing fertilizer and microbial nutrient that significantly improves the effectiveness of conventional inorganic fertilizer programs. Unlike modern inorganic fertilizers, the convenient addition of *Carbonizer* greatly enhances the nutrient release and carbon cycles of soil for improved productivity.”**

*Carbonizer is a fine filtered, liquid carbonaceous fertilizing material which is also referred to as a “liquid compost.” Carbonizer contains a balanced content of organic materials, known as carbohydrates, that are used by chemical and microbial processes to enhance soil fertility. Carbonizer is compatible with most liquid fertilizers and add balanced nutrition to your fertility program.*

### Carbon Nutrition

Just as carbohydrates are important to animal nutrition, carbohydrates are important to plant nutrition. However, the mode of action is a little different. This is based in the need for these carbon containing material to be converted to carbon dioxide by heterotrophic microorganisms in the soil, first.

In this process these carbon containing materials are used as energy for microbial processes. In these processes, known as

humus formation, the microbes provide many useful benefits to plant growth. These include:

- Organic matter decomposition
  - Faster residue breakdown
  - Nutrient availability
- Nutrient Cycling.....
  - Nitrogen Fixation
  - Immobilization
  - Mineralization
- Physical Properties
  - Tilt, flocculation, aeration, drainage, infiltration improvement.
- Balance
  - Synergistic activity between organic and inorganic fertility components.

Pure chemical inorganic fertilizers do not contain organic materials to “feed” the carbon cycle in soil. Likewise, many growers have abandoned organic material additions (manuring), because of convenience, cost or availability.

Over the last few decades of growing without regular organic matter additions, organic materials have been mined out of soil, compounding the problem.

### Balance

Including *Carbonizer* in your fertilizer programs balances the organic processes in soil by stimulating a diverse and prolific soil microbial population (see result table). *Carbonizer* does not replace your fertility program. *Carbonizer* will help make your existing soil fertility and plant nutrition program work more effectively.

### Nutrient Release On Demand

*Carbonizer* enhances organic matter additions.... When applied in conjunction with organic fertilizer additions and plant residue incorporations, *Carbonizer* accelerates the release rate of nutrients by enhancing the Decay Series. The Decay Series is the rate by which nutrients are released from organic fertilizer additions. The rate of “Decay” or “mineralization” from organic matter is a function of microbial activity. *Carbonizer* will enhance microbial decomposition over that rate experienced with compost or manure alone; making organic additions less of a nuisance and of more value.

### Use Rates

Apply the first *Carbonizer* application as the primary inoculant in a preplant application on annuals and in the late fall through early winter on perennials. This is usually accomplished through the most convenient delivery means: sprinkler, drip, banded or broadcast. The customary rate is 15 gallons per acre.

Once the primary inoculant has been applied and after planting, subsequent applications are merely a matter of a maintenance program to further assist the beneficial activity. This is usually accomplished through water-run or side dress applications tank-mixed with fertilizers. The standard program includes at least two 5 gallon applications. Apply a total of 20-40 gallons per acre per season.