



# Products Information

## Bison Soil Organic Biochar for Greenhouses



### Bison Soil Organic Biochar Controls Disease

The controlled environment of greenhouses, the high value of the crops, and the limited number of registered fungicides offer a unique niche for the biological control of plant diseases in greenhouses. Many plant pathogens can be found in soil. Fungi such as *Pythium*, *Phytophthora*, *Fusarium*, *Rhizoctonia*, and *Thielaviopsis*, crown gall bacteria (*Agrobacterium*) and most nematodes reside in the soil. The cost of controlling disease is in the millions of dollars a year and managing disease is often the key to a viable operation.

Biochar is naturally a disease free medium. The use of biochar in place of soil eliminates the soil borne pathogens.

University studies have shown that biochar induces resistance to fungal pathogens in some of the plants studied. The use of biochar mixed with soils can reduce fungal pathogens in peppers, tomatoes and strawberries. As research continues, it is likely that additional plants will show resistance to fungal pathogens.

Pepper Plants: Studies have found that soil-applied biochar induces systemic resistance to the foliar fungal pathogens *Botrytis cinerea* (gray mold) and *Leveillula taurica* (powdery mildew) on pepper plants and the broad mite pest (*Polyphagotarsonemus latus* Banks).

Tomato Plants: Studies have found that soil-applied biochar induces systemic resistance to the foliar fungal pathogens *Botrytis cinerea* (gray mold) and *Leveillula taurica* (powdery mildew) on tomato plants.

Strawberry Plants: Studies have shown that biochar additions to the potting medium of strawberry plants suppressed diseases caused by the three fungi, (*Botrytis cinerea*, *Colletotrichum acutatum* and *Podosphaera aphanis*) which have very different infection strategies. This suggests that biochar stimulated a range of general defense pathways in the strawberry plants that may be seen in other plants.

### Description of Bison Soil Organic Biochar

Bison Soil Organic Biochar for the greenhouse industry is sold by Bison Soil and optimized for superior performance to enhance plant growth by retaining nutrients and water; improving soil physical, chemical and biological properties; enhancing crop growth with less agronomic inputs; increasing beneficial microbial colonization; and suppressing disease. This Bison Soil Organic Biochar is manufactured from clean wood biomass to maximize its ability to improve soils, plant growth and suppress disease.

Bison Soil Organic Biochar lasts for hundreds of years, so it stays in the soil providing benefits for greenhouse plants for years and years. Bison Soil Organic Biochar is not only good for greenhouses, but it is also good for the planet because it is a natural, USDA Certified Biobased soil amendment that is derived from plant biomass that would otherwise be a waste product in a landfill.



## **Application Rates for Bison Soil Organic Biochar**

With its ability to improve soil, plant health and suppress disease, Bison Soil Organic Biochar is ideally suited for use in greenhouses either as a soil substitute or as an amendment. The rates for soil amendments below are based on research and provide general guidance for the use of Bison Soil Organic Biochar.

These are typical application rates, and rates for a given situation depend on the soil type and condition. We thus suggest that trials be conducted with your specific soil and greenhouse plants to determine the best Bison Soil Organic Biochar concentrations.

Bison Soil Organic Biochar can be applied to plant beds, either when they are first planted or biochar can be worked into the soil around each existing plant. Adding 2-5% (w/w) requires approximately 435 to 1000 cubic feet, respectively, of Bison Soil Organic Biochar applied to approximately 1/4 acre (10,000 ft<sup>2</sup>) at 6 inches deep. This is equivalent to approximately 8100 to 20,300 lbs of Bison Soil Organic Biochar.