

# BioChar Wood Vinegar



## BioChar: A Natural remedy for Soil and Plant Health.

The next page includes directions for suggested use of Biochar and our signature Wood Vinegar. SFB's Biochar is a premium soil amendment that is a result of our patented Horizontal Bed Kiln and novel pyrolysis process. Our wood vinegar is OMRI Organic Certified for use in agriculture and is derived from biomass harvested sustainably to make the forest healthier. It contains a blend of naturally derived micro and macro nutrients that enable the plant to be healthier and more productive. Every ton of Biochar we produce sequesters 2.5 tons of C PERMANENTLY in the ground! Thank you for making the world healthier.

Come Grow With Us @ [www.sfbiochar.com](http://www.sfbiochar.com)



# Directions for use

## BioChar Application

Charge your biochar by adding your normal fertilizer regime (15-15-15 etc) and allow to soak for a week or two. If using compost or manure: let sit mixed with compost at a rate of 10% Biochar to compost mix, for 1 month before applying to plants. Seneca Farms Wood Vinegar can also be used to charge Biochar at a dilution of 100:1 for 1 week.

- When adding Biochar to soil or compost, keep the ratio to 5-10% max overall Biochar addition.
- Add a couple of spoonful's to home compost to keep odor down. Spread on animal waste to eliminate odor.
- Use in refrigerator in place of baking soda----Use in basements to keep from getting musty smell.
- Spread it on your lawn at a rate of
- Great addition for animal bedding, spread a cup in the middle of pen to reduce ammonia odor

## Wood Vinegar Suggested Use. \* NOT FOR HUMAN CONSUMPTION-DO NOT USE FULL STRENGTH

Most applications for Plant use require a 200:1 Dilution or .67 oz per gallon. Application suggestions are as follows:

- Seed Soak- 200:1 dilution for 24-36 hours- ensures germination and boosts early growth
- On emergence- 200:1 dilution foliar spray 1x a week for 2 weeks
- Frost Damage-spray on at 200:1 to encourage re-flowering
- Spray on compost pile to supercharge bacteria and fungus growth and keep odor down
- House plant- Spray or. Apply direct to soil with normal watering 1x every 2 weeks
- 1 Gallon Covers 10 acres 1x -----1 pint will do 1.1 acres -----2oz makes 4 gallons





### Biochar for CBD Hemp Cultivation

During the 2019 grow season, Mills Family Farm, in collaboration with Seneca Farms Biochar, piloted a CBD hemp research study to determine the efficacy of biochar as a novel soil amendment. A 3,000 year-old fertilization technology, biochar is an organic, carbon-rich substrate that promotes nutrient bioavailability, beneficial soil microbiota, and water retention. Each of these factors are critical to peak cannabinoid production during in the cultivation of CBD hemp. Accordingly, we hypothesized that the incorporation of biochar into native soil would produce superior hemp growth and CBDa production compared to traditional N-P-K application.

### 2019 Pilot Study Design

Native soil testing confirmed the homogenous distribution of Ontario loam soil, and a routine application of commercial N-P-K was fertigated throughout the plot. The parcel was subdivided into three experimental groups: a control sector receiving only N-P-K, a test sector receiving organic soil rejuvenator (pasteurized plant and animal biomass containing nutrient-loaded biochar and effective microbes), and a test sector receiving unloaded biochar amendment infused with effective microbes post-application. Biochar amendments were disced into the soil to a depth of several inches prior to transplanting approximately 500 feminized *Merlot* (*Berry Blossom* x *Cherry Wine*) CBD hemp seedlings per sector. Of note, due to workflow constraints planting was done relatively late in the season (mid-July). Plants were watered modestly throughout growth, given approximately 0.5 gallons/plant 1x/week via drip irrigation.

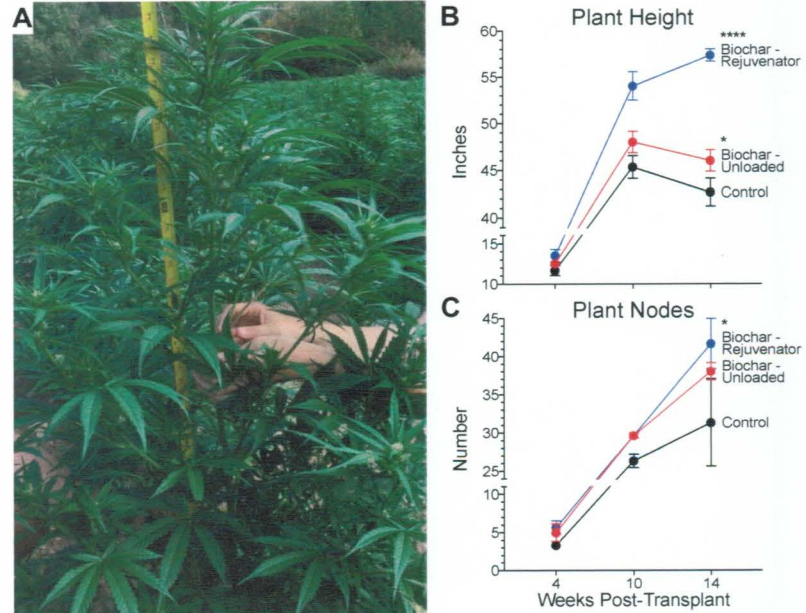


Figure 1.

### Biochar Improves CBD Hemp Yields

Plant size was randomly sampled (n=5 per sector per timepoint) at weeks 4, 10, and 14 post-transplantation (Figure 1A). At each timepoint we observed increased plant height and node number in both treatment groups relative to N-P-K-only controls. *Comprehensively, these data demonstrated significantly increased plant height in both biochar-treated sectors (Figure 1B), and significantly increased node numbers in the rejuvenator sector (Figure 1C).* Cannabinoid testing was performed on 5 pooled flower specimens (per sector) following harvest, and results indicated a gain of nearly 3 CBDa percentage points with biochar treatments (Figure 2). *In summary, these findings suggest that nutrient-loaded, inoculated biochar soil amendment may produce >60% increases in CBD hemp yield (% CBDa x lb. biomass).*

### On-Going Biochar/Hemp Research

This 2019 pilot study has clearly demonstrated the potential for biochar as a leading organic fertilizer in the CBD hemp space. Over time, biochar will continue to sequester nutrients and microbes, further stabilizing the soil ecosystem. As such, we anticipate equal or greater yield gains (specifically in the unloaded biochar sector) during subsequent cultivations without additional application. Longitudinal studies will be implemented to assess the persistence of biochar, and provide a more rigorous analysis of revenue gains by way of direct measurement of flower biomass production.

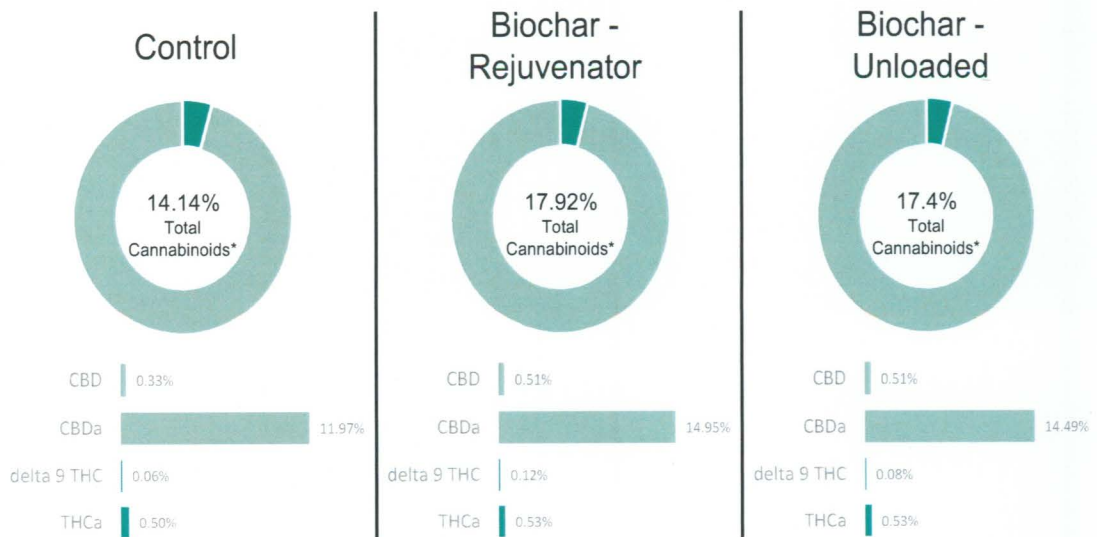


Figure 2.