



Precision Biochar

Build Soil Health & Sequester Carbon

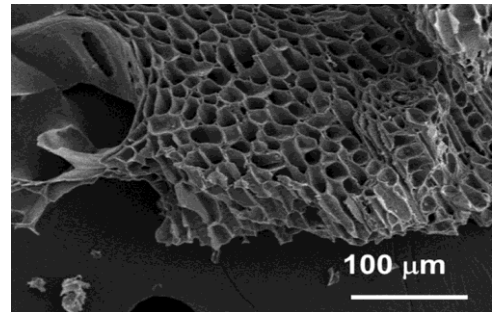
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N-Sense Introduces Precision Biochar – Strategic application of biochar, together with manure, compost, or other organic amendments, can build soil health, sequester carbon, and lower the carbon intensity (CI) of grain. Biochar applications may make farmers eligible for both CI-score based premium grain pricing and USDA-NRCS support payments under the Soil Carbon Amendments Conservation Practice Standard (Code 336).

Background: Biochar is made by heating corn stover, wheat straw, wood chips or other biomass in the absence of oxygen to temperatures above 450°C (842°F). Biochar builds soil organic matter while sequestering carbon for hundreds to thousands of years. It can be produced in small on-farm kilns or commercially as a coproduct of bioenergy or biofuel production using industrial-scale gasification and fast pyrolysis technologies. While farmers have used charred biomass to improve soils for more than 1000 years; currently interest in biochar is growing rapidly as awareness of its soil health benefits increases and as the need for durable carbon removal becomes more urgent.

How Biochar Works: Biochar is a low-density material that lowers soil bulk density and increases soil porosity, aeration, and internal drainage, thereby promoting root growth. Its many micropores provide habitat for soil microorganisms and help retain plant-available water and nutrients, reducing nutrient leaching and improving nutrient use efficiency. According to Rosenberg and Wallander (2022. USDA-ERS, Bulletin 234, EIB-234), 33% of US farmland soils have experienced significant topsoil loss, 22% are affected by compaction, and 19% have poor internal drainage. Biochar can help remediate these problems.



Electron microscope image of a biochar particle. A human hair is about 100 μm wide.

The Biochar Industry is Growing Rapidly: About 90% of delivered durable carbon removal credits sold globally are Biochar Carbon Removal (BCR) credits. BCR credits solve the additionality and permanence challenges associated with other bio-based carbon removal credits. BCR credits currently sell for \$150 to \$200 per tonne of CO₂e, equivalent to \$300 to \$500 per ton of biochar. Major purchasers of BCR credits include Microsoft, Google and other tech companies seeking to offset their carbon emissions. Statistics MRC projects that the global market for BCR credits will rise from about \$304 million in 2025 to about \$1,847 million by 2032. <https://25023219.fs1.hubspotusercontent-eu1.net/hubfs/25023219/Supercritical%20Biochar%20Offtakes%20Report.pdf>

Biochar Prescriptions: N-Sense develops biochar prescriptions tailored to each field to address specific soil problems, including degraded, eroded and low-organic-matter soils; sandy soils; low nutrient and water use efficiency; root-restricting layers; acidity; and poor internal drainage. Each prescription includes recommendations on the type of biochar to use, application rate, application method, and where within the field biochar should be applied. We also indicate whether co-application of lime, fertilizer, manure, compost, or other organic amendments are recommended.

On the following page is an abbreviation example of a biochar prescription for a 36.6-acre field in central Iowa.



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For Soils With Low Organic Matter, Low Microbial Activity, And/Or Low Water-Holding Capacity

Biochar

Feedstock: Crop Residue

Peak Temperature: Medium (450-600 °C)

Application Method: Surface-apply biochar in zones and incorporate to ~6 in depth

Manure/Compost/Sludge

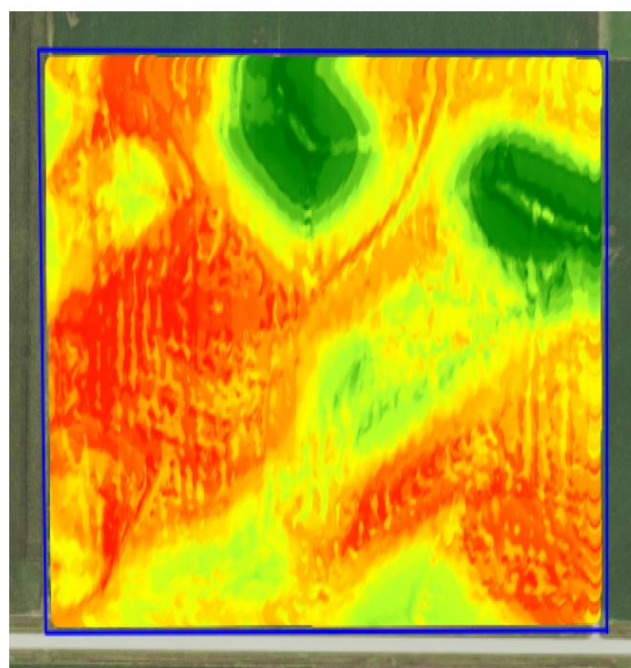
Type Of Manure/Compost: solid cattle manure

Estimated Tons/Acre: 10

Biochar Index			
Biochar Zone Ranges	0-0.52	0.52-0.7	0.7-1
Biochar Index Levels	Low	Medium	High
Average Biochar Index	0.3	0.59	0.82
Acres in Zone	23.8	8.5	4.3
Biochar (Tons/Acre)	0	5	10

Total Biochar Needed: 85 Tons

Biochar Index Map



Biochar Management Zones

