

Improving Soil Fertility with Rock Dust Blends and Biochar

Block 14

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Rationale: Soil fertility directly impacts the yield and nutrient density of the plants grown within it. Plants remove water and nutrients from the soil as they are used. Conventional fertilizers applied to replace these nutrients often contain only a handful of elements that are the most used in plant growth. With time, this results in deficits of the nutrients that are not replenished in some way, which translates into less nutritious food. Use of ground rock dust blends as a soil amendment may provide a more complete source of many plant-available elements and minerals, allowing for more wholesome plant growth and the production of higher quality, more nutrient-dense foods. The mechanism by which the rock dust is broken down also provides long-term improvements to soil fertility, reducing the resources needed to apply the amendment, thereby improving the overall sustainability of the growing operation.

Additionally, biochar has been promoted as a sustainable soil amendment able to further improve overall soil quality by stabilizing the pH, increasing cation exchange capacity, acting as a nutrient-sink to minimize issues with leaching and contamination, keeping nutrients where they are physically available to the plant, and locally improving soil texture and water retention.

Both rock dust and biochar offer sustainable uses for by-products of other industries, such as forestry and drilling/mining. They may eventually offer affordable, long-term soil improvement for farming operations wishing to engage in environmentally friendly or sustainable agricultural practices.

Research Goals: The goal of this study is to examine the efficacy of applying a locally-mined basalt rock dust blend and biochar as soil amendments - their effects on overall soil health and function, and plant yield and nutrient density within a single growing season. This study examines the growth of La Roma tomatoes, and Aruba sweet peppers, both grown as conventional crops in the Pioneer Valley.

Treatments: Four levels of rock dust, two levels of biochar, four replicates, thirty-two total plots:



Rock dust applied on fields



Tomatoes and peppers, July 2014

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