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## GSA Connects 2022 meeting in Denver, Colorado

Paper No. 98-12

Presentation Time: 9:00 AM-1:00 PM

### **LIVING OFF THE LAND: SOIL HEALTH MAINTENANCE THROUGH SUSTAINABLE FARMING/"AGRO-ECOLOGY" PRACTICES AT A TEA FARM IN HAWAII**

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The goal for farmers in the sustainable farming/ "agro-ecology" movement is to design the cultivation environment to resemble a sustainable ecosystem more than a factory. This approach focuses farmers' efforts on optimizing cultivation conditions from an evolutionary perspective to reduce the negative environmental impact of their practices without reducing crop yield. To do this, fewer chemical fertilizers and pesticides are used to compensate for suboptimal long-term plant health at the expense of short-term productivity. Inherent in this approach is the use of more natural, ecological strategies to optimize crop quality and productivity in a sustainable fashion. The aim of this project is to begin to investigate the efficacy of some of these practices on the production of tea from an integrated geobiological framework. Our investigation will focus on the Big Island Tea farm located on Hawaii, HI. In terms of the five soil-forming factors, this farm offers an ideal context to investigate the effects of agriculture methods on soil health. Located on the flank of Mauna Loa, farm soils are developed on consistent basalt and ash parent material that is well dated. Slope is consistent, and minor annual variation in temperature and precipitation allows us to assume a constant climate throughout pedogenesis. Agricultural methodology can therefore be treated as the single independent variable. The farm consists of multiple fields with distinct ecological contexts so that each field acts as a different treatment plot, while nearby untilled soils hosting native vegetation act as the control plots. Soil survey data show that the soils are acidic and well drained, making them well suited for tea production. Crop data exists for each field from establishment of the farm in 2001 to present. These locations on the Big Island Tea farm will be compared with commercial monoculture conditions at nearby farms. Preliminary work began in January 2022, with the collection of two soil cores from the site for description and measurement of physical and chemical properties: one from an active field and the other from an uncultivated area.

Session No. 98--Booth# 92

[T17. Emerging Voices in Soil and Paleosol Science \(Posters\)](#)

Monday, 10 October 2022: 9:00 AM-1:00 PM

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