Crop yields in Sub-Saharan Africa (SSA) tend to be well below potential, preventing asset accumulation and sustainable economic development among low-income rural farmers. To increase yields, combinations of inorganic and organic agricultural inputs are necessary. However, rural smallholders usually do not have sufficient information about their soil nutrient levels to make profit maximizing decisions about input usage. Moreover, government recommendations tend to focus solely on inorganic fertilizer usage, ignoring the need for complementary organic to increase and sustain yields. However, inorganic fertilizers may not be effective if soil organic matter is low (a common problem in the region), and which may acidify the soil and cause other detrimental environmental consequences after heavy prolonged use. This leads to sub-optimal combinations of inputs, food insecurity, and reduced ability to increase household incomes. In this study, we developed and conducted two-round experimental auctions to test whether providing soil test information and agricultural input recommendations to farmers affected their behavior and ability to optimize their input choices. We auctioned packages of inorganic and organic inputs, dividing farmers into different soil fertility information treatments, and analyzed the data using triple difference estimation methods. We find that providing soil fertility information has significant effects on farmers’ demands for agricultural inputs: recommendations to use inorganic fertilizer increase willingness to pay by 61 compared to the baseline, while recommendations to use organic fertilizers lead to more nuanced effects that depend on the gender of the respondent. Organic agricultural inputs in particular are generally underused in SSA yet have particular potential for improving crop yields, especially in areas with highly carbon-degraded soils. However, it is difficult for farmers to gain accurate measures of their soil nutrient levels in order to determine an optimal match with agricultural input levels. Coupled with liquidity constraints, uncertainty regarding appropriate input use for a particular farmer’s soil nutrients and soil type limits the adoption and intensity of use of often necessary soil amendments. Soil testing may therefore be a key tool in optimizing farmers' agricultural input choices, reversing soil degradation, and providing sustainable development in rural SSA.