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HOW BIOCHAR CONTRIBUTES TO INCREASE AGRICULTURAL YIELDS? A STUDY ABOUT THE LINK BETWEEN BIOCHAR AND ETHYLENE.

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Biochar, a charcoal used as a soil amendment, is reported to increase crop yields. However, mechanisms behind this effect are not yet fully understood. Recent studies showed that biochar increases the production of ethylene (C2H4), a phytohormone, suggesting an ethylene-mediated mechanism by which biomass yields are increased. In order to verify this observation a pot experiment was performed with Arabidopsis thaliana ecotype Col-0, which shows elongation and early germination in the presence of ethylene, and the etr1-3 mutant, which is insensitive to ethylene. Seeds were sown in sealed jars in a soil amended with 0, 5 and 10% of biochar. After 15 days we observed hypocotyl and petiole elongation and earlier plant germination in the wild-type compared to the ethylene insensitive mutant. The difference between the mutant etr1-3 and its wild type ewas more evident at higher biochar concentrations, suggesting that ethylene production is due to biochar. These observations have been verified and confirmed through ethylene assessment with a GC fitted with a FID detector. This presentation will illustrate the key results of our study, discussing how ethylene effects might eventually translate into potential benefits in field application of biochar.