EFFECT OF BIOCHARS ON ADSORPTION OF BENTAZONE AND PYRACLOSTROBIN TO A
SILTY CLAY SOIL

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The recent interest on the use of biochar as soil amendment is due to the beneficial properties attributed to biochars. There are limited studies dealing with the effect of biochar on the behavior of pesticides applied to crops. The objective of this work was to study the effect of different biochars on the adsorption of the herbicide bentazone (3-isopropyl-1H-2,1,3-benzothiadiazin-4(3H)-one 2,2-dioxide) and the fungicide pyraclostrobin (methyl 2-[1-(4-chlorophenyl) pyrazol-3-yloxymethyl]N-methoxycarbanilate) to a silt loam soil. Bentazone is used to control broadleaf weeds in crops such as corn, rice, and soybeans. It is an anionic herbicide and it is considered mobile in soil, with the subsequent risk of run off or leaching and surface and/or ground water contamination. Bentazone was completely adsorbed by the soils amended with the biochars produced from wood pellets. However, lower sorption of the herbicide was observed in the soil amended with the biochar made of macadamia nut shells as compared to the unamended soil, which can be attributed to the interactions and competition of the dissolved organic carbon (DOC) of the biochar with bentazone for the adsorption sites. Pyraclostrobin is a foliar fungicide considered very toxic for aquatic organisms. Our results showed that it is highly adsorbed to soil, and addition of biochars to soil did not increase adsorption. Thus, addition of sorbents to increase its retention in soil is not necessary. Biochars with high surface areas and low content on DOC can increase the adsorption of highly mobile pesticides in soil.