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Soil Productivity after Decomposition of Waste Materials under Different Soil Moisture and Temperature

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Abstract: Productivity of the soil with waste material (WM), i.e., bagasse, coir dust, rice chaff and rice straw decomposed for two months at various temperatures and soil moisture were investigated by analyzing the chemical properties and growth of maize cultured on the soil for 45 days. The soil with decomposed WM (WM soil), tended to show lower pH values than the soil without WM soil (control) as a whole. The values of electric conductance were higher in WM soil, especially in the soil with decomposed rice chaff and rice straw referred to as rice-chaff and rice-straw soils, respectively. The total N content tended to be higher in the WM soil except for coir dust soil. The total C content tended to be higher in all WM soils. The difference in the content of total N and total C between WM and control soils was remarkable in bagasse soil. The change of the chemical properties of the soil did not apparently correlate with the rate of CO₂ generation during incubation of WM soils, but pH, electric conductance, content of total N and total C contents were higher in the soils generating CO₂ at a rate of 40 to 80 ppm min⁻¹, in bagasse or rice straw soils. The dry matter production of maize on WM soils was positively correlated with the rate of CO₂ generation. It was suggested that the WM soils generating little CO₂, such as the soil with bagasse or rice straw decomposed in a dry condition, tended to inhibit maize growth owing to low pH and shortage of available nitrogen by rapid decomposition just after the start of maize growth. The wet WM soils generating CO₂ format a rate of 40 to 80 ppm min⁻¹, e.g., bagasse and rice straw soils might be favorable for dry matter production of maize.

Keywords: [Decomposition rate](#), [Maize](#), [Soil productivity](#), [Waste materials](#)

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