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Response of Soybean, Sugar Beet and Spring Wheat to the Combination of Reduced Tillage and Fertilization Practices

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Abstract: To evaluate the feasibility of conservation tillage in combination with reduced biocide and fertilization regimes, we conducted a field experiment using conventional and reduced tillage, with or without reduced biocide, and fertilization regimes for growing soybean, sugar beet, and spring wheat in this order for three years. Root biomass and sugar yield of sugar beet did not differ with any combinations of conservation practice. Although leaf biomass was significantly reduced under reduced chemical fertilization (replaced partially with manure compost), it was compensated by a greater specific leaf area. Early crop growth of soybean, and spring wheat was increased to some extent under reduced tillage, which indicated a better nutrient utilization, as well when combined with reduced biocide application. However, reduced fertilization could not supply as much nitrogen as conventional chemical fertilization especially in the combination with reduced tillage. Larger amount or long-term application of organic fertilization may be necessary under reduced tillage compared to the requirement under conventional tillage to compensate for lower rate of nitrogen release from organic matter.

Keywords: Manure compost, Nitrogen availability, Reduced tillage, SLA

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