

TITLE: SOIL ADJUVANTS AND THEIR EFFECTS ON MICROBIOLOGICAL ATTRIBUTES AND PLANT DEVELOPMENT

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ABSTRACT: Brazil is the second and third largest producer of soy and corn, respectively. Nonetheless, irregular climatic conditions within the seasons have caused changes in climate and directly affected the crop. In this context, the use of soil microorganism activators (FMA) and adjuvants, such as water retention (ADRET) and infiltration (ADIF), have become more frequent. The objective of this work was to evaluate the effects of these products on the soil microbiota and the development of soybean and corn. The adjuvants ADRET and ADIF were evaluated at concentrations of 0.5, 1.0 and 2.0 L ha⁻¹ and the activator AMF was evaluated at concentrations of 2.0, 4.0 and 6.0 L ha⁻¹, with and without the adjuvants, totaling 16 treatments per culture. The experiments were conducted in greenhouse in 9 L pots totaling 160 vessels. Carbon monoxide biomass (MBC), basal respiration (RB), metabolic (qCO₂) and microbial quotient (qMIC), soil chemical analysis and fresh and dry mass of shoot and root were analyzed. The results indicated that the use of lower concentrations of ADRET and higher concentration of ADIF provided better results evidenced by microbiological attributes and the development of the plant in the two crops (soybean and corn), demonstrating the direct influence of soil moisture. However, the use of FMA in low concentration showed better results in soybean crops compared to maize, in all parameters analyzed. Microbial colonization in the plant rhizosphere was directly influenced by exudates released by plants. The use of FMA with ADIF or ADRET showed opposite effects in the two cultures, showing better results when applied at higher concentration in soybean in contrast to low concentrations in maize. This is possibly related to the diversity of the microbial community colonizing the rhizosphere. Thus, we conclude that the ADRET and ADIF adjuvants in the presence or absence of FMA directly influence the availability of water in the soil, affecting the soil microbiota and consequently the development of the plant.

KEYWORDS: soil microbiota, adjuvants, microorganism activators