The Magic Mulching Film: Effects of Lignin-Based Fully Biodegradable Mulching Film on Soil Microorganisms

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Lignin-based fully biodegradable mulching film (LFMF) is a new product produced from paper waste, which is in the trial stage of farmland use. Its impact on soil microorganisms has not been reported in literature. From the perspective of protecting farmland soil environment, this paper explores the effect of LFMF on the quantity, species and distribution of soil microorganisms. The design collected soil samples from different test groups and control groups at different times in the film-covering stage and film-burying stage to detect microorganisms: the quantity is measured by Spread Plate Method, and the species are determined by High Throughput Sequencing. The data were processed by Independent Sample T Test and Analysis of Variance. The results showed that the number of bacteria, fungi and actinomycetes in the soil was significantly reduced when the soil was covered with LFMF, and the number and species of soil microorganisms increased significantly with time when the mulching film was buried into the soil, namely, the increasing degree of actinomycetes is greater than fungi than bacteria. There is a positive correlation between microorganisms and the residue of plastic film, and the microorganisms in the soil may have a "film tendency phenomenon". In this paper, it is clarified for the first time that the quantity and species of microorganisms can be increased, and the distribution can be changed by burying LFMF into the soil, which provides a reference for the research, application and promotion of LFMF.

Awards Won:

Second Award of $2,000