

Phytotoxicity and respiratory activity of soil in the first year of fertilization with spent mushroom substrate

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INTRODUCTION

The economic and living activity of man is associated with the generation of huge amounts of various types of waste, characteristic for a given form of human activity. One of such waste is the substrate left over from mushroom cultivation. According to the latest data, Poland is a leader in the mushroom industry in Europe.

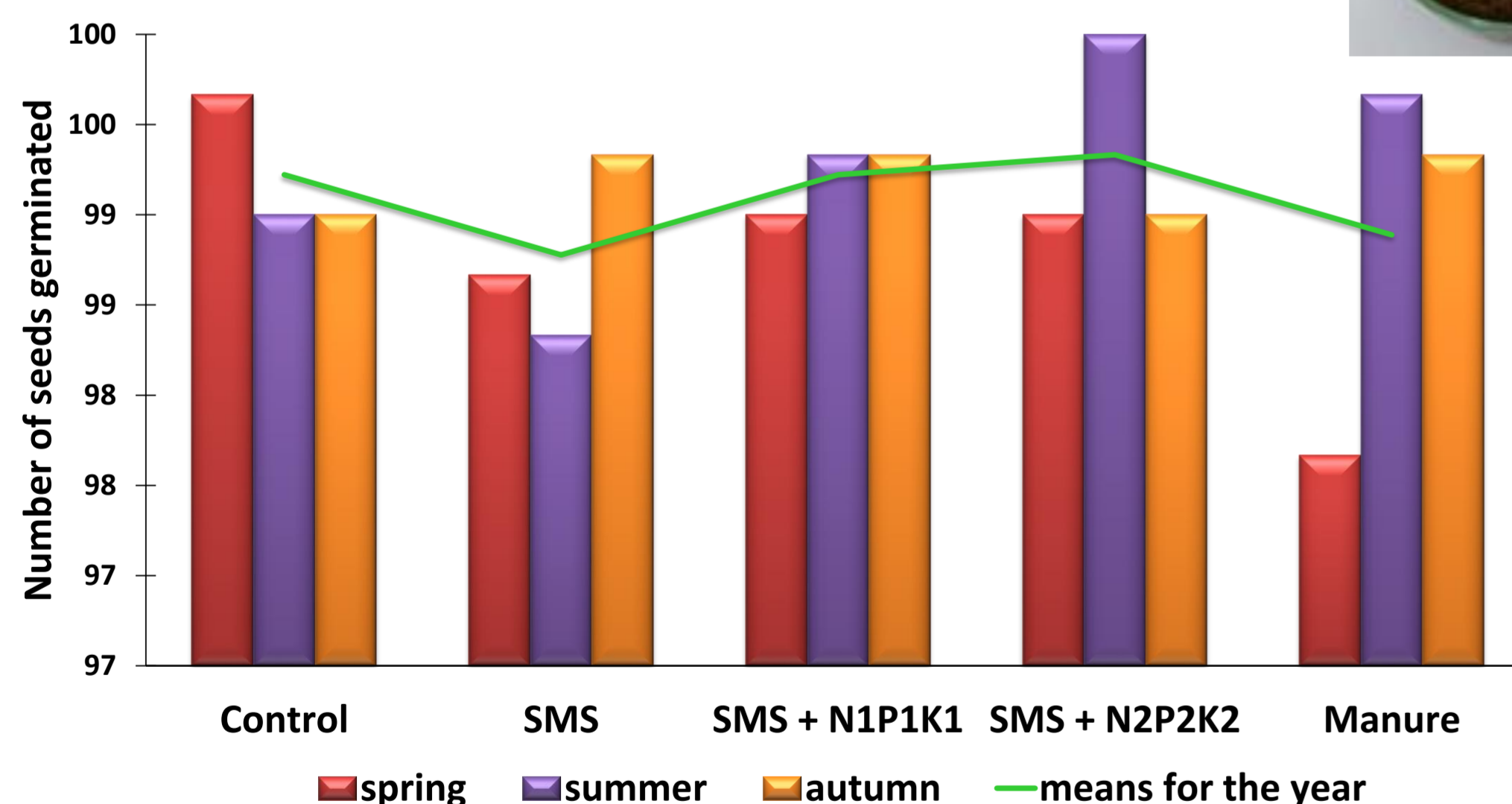


AIM

The aim of the research was to assess the phytotoxicity and respiration of soil subjected to annual fertilization with spent mushroom substrate and manure.

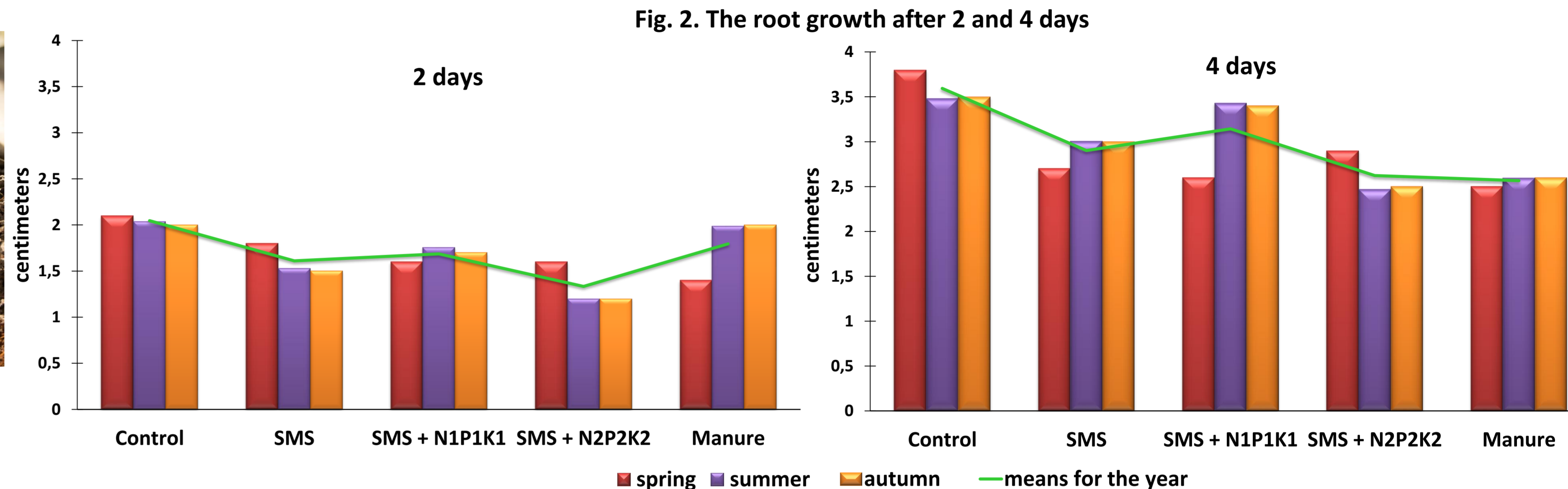


Fig 1. Germination *Lepidium sativum* in soil solution



MATERIALS AND METHODS

The research was carried out on a model of a field experiment in which individual objects were fertilized with: spent mushroom substrate (SMS), manure, mushroom waste together with NPK mineral fertilization applied in two doses. All plots were sown with *Lolium multiflorum*. The non-fertilized soil was the control. In the first year based on the analysis of parameters related to the initial stage of development of the plant, the number of seeds germinated in the soil and the weight of sprouts that make up the growth index were examined, root length, germination in soil solution, respiratory activity were analysed.



RESULTS

The applied methods of fertilization did not show any significant effect on the germination in the soil solution. Fertilization did not have a positive effect on the length of the root. The inhibition of the root growth measured after 2 and 4 days in the fertilized soil as compared to the control soil was observed throughout the entire study period. The least favorable for this analyzed parameter turned out to be the addition of manure and mushroom substrate with fertilization at the N2P2K2 level. The applied methods of fertilization resulted in the stimulation of the growth index, which was most pronounced in spring and summer. The most beneficial for the development of the test plant turned out to be the application of the mushroom substrate together with mineral fertilization at the level of N2P2K2. A decrease was recorded only in autumn in the object with mineral fertilization at the level of N1P1K1. All methods of fertilization stimulated respiration. This effect was most pronounced in spring in objects with mushroom waste, including mineral fertilization on both levels.

