Research Journal of Pharmaceutical, Biological and Chemical Sciences, 2016, vol.7, N5, pages 1758-1764

Optimal doses and schemes of suppressive compost amendments

Galitskaya P., Kuryntseva P., Biktasheva L., Selivanovskaya S.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Fungal plant diseases cause dramatic yield losses worldwide. Suppressive composts, which possess both fertilizing properties for plants and inhibiting properties for plant pathogens, represent an effective and environmentally friendly alternative to conventional pesticides. In this work, composts obtained from agricultural wastes using microbial biopreparation were applied to suppress Fusarium wilt in tomato plants in model experiments. We evaluated several doses of compost amendments: 1, 5, 10, 15, 20, and 25%. In our experiments, a dose of 20% was most effective and resulted in disease suppression of 84%. From the three amendment schemes investigated (1 - once before vegetation season, 2 - twice before vegetation season with one month break between amendments, half of the dose each time, 3 - twice, once before winter frost simulation, once before vegetation season, half of the dose each time) with a 20% dose, the first scheme was the most efficient one. Schemes 2 and 3 were 1.6 and 1.5 times less efficient, correspondingly. After a single amendment with 20% of compost, soils were suppressive during two consecutive vegetation periods (21 days each) of tomato plants. During the third vegetation period, suppressiveness decreased by 1.7 times. No significant differences in disease inhibition was found between suppressive compost and conventional fungicide "Maxim" application, based on fludioxonil under laboratory conditions. However, under greenhouse conditions, suppressive compost application was more efficient.

Keywords

Compost amendments, Fungicide, Fusarium oxysporum, Plant disease, Suppressive composts