

NATURE SAFE® RESEARCH

UNIVERSITY RESEARCH DATA

TITLE: Influence of Nature Safe on the Microbiology of Soil

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I. Introduction and Procedures

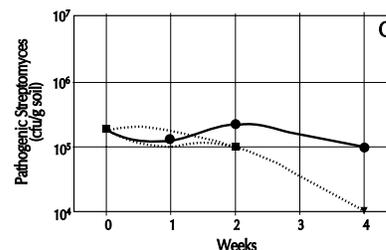
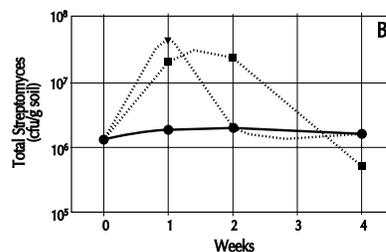
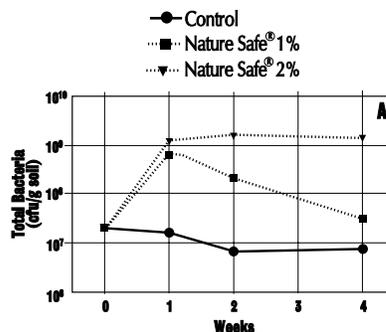
Nature Safe fertilizers are believed to be beneficial to the microbial populations of the soil. Observation of improved plant health have been documented. This research examines the effect of Nature Safe on the soil environment. For ease of examination soil was taken from a potato farm known for high incidence of potato scab and Verticillium wilt. Potato scab is caused by bacteria belonging to the genus *Streptomyces* and Verticillium wilt is caused by the fungus *Verticillium dahliae*. Research has shown these two pathogens to be an excellent model system for studying the impact of soil amendments on the reduction or increases of disease caused by soilborne pathogens.

Soil from a potato field was collected and mixed with Nature Safe at 1% and 2% w/w. The soil mixtures were placed in test tubes and incubated at 25°C in the dark. Twelve test tubes were set up for each treatment and three test tubes with treatments were sampled at one, two and four weeks. Populations of total bacteria, total *Streptomyces* were determined by planting soil extractions onto selective media. *Verticillium boiassay* consisted of sealing microsclerotia (MS) of *V. dahliae* in nylon mesh bags which were buried in the soil mixtures. After four weeks the bags were removed, MS plated out on selective media.

II. Test Results

INFLUENCE OF NATURE SAFE ON THE MICROBIAL POPULATION OF SOIL FROM A POTATO FARM

Both concentrations of Nature Safe caused the total bacterial population to increase from 30 million to a billion bacteria/g soil. The total *Streptomyces* population also increased for both treatments with levels coming back down to control levels after four weeks. Both concentrations of Nature Safe caused a decrease in the pathogenic *Streptomyces* population from about 300,000 to below 10,000 bacteria/g soil and reduced the germination of *V. dahliae* MS to almost zero.



III. Conclusion

Nature Safe increased the total bacterial population in the soil while decreasing the populations of two pathogens.

INFLUENCE OF NATURE SAFE ON THE VIABILITY OF VERTICILLIUM DAHLIAE MROSCLEROTIA

