CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY

Name(s)

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Project Number

S1905

Project Title

Investigation of Various Chemical Treatments for Root-Knot Nematodes

Abstract

Objectives/Goals

The objective of this project was to learn the effect of different nematode treatments, specifically Nimitz and Velum, on tomato plants grown in soil infested with root-knot nematodes. The hypothesis states that Nimitz will be most effective in resisting nematode activity and result in highest root-shoot ratio in tomato plants grown in treated soil.

Methods/Materials

Two chemical treatments were used, Nimitz and Velum. Two control treatments were used, Miracle Gro soil and nematode-infested soil. Each treatment had five plants. The plants were germinated, then grown in a greenhouse for four weeks. Following this, they were assessed by measuring fresh and dry weights of root and shoot. The fresh and dry root-to-shoot ratios were calculated.

Results

The tomato plants grown in the Nimitz treatment resulted in the highest root-to-shoot ratio, at 0.67. The plants grown in normal soil had root-to-shoot ratio greater than the plants grown in nematode-infested soil, at 0.36 and 0.21, respectively. The plants grown in Velum treatment had average root-to-shoot ratio at 0.34. An ANOVA analysis of root-to-shoot ratio of dry plants showed that the two treatments were statistically indifferent.

Conclusions/Discussion

My hypothesis was partially correct. The plants grown in the Nimitz did have the highest root-to-shoot ratio numerically, but based on ANOVA testing, there is no significant difference between Nimitz and Velum treatment. The Nimitz did prevent against root galling. Although nematode-resistant tomato varieties exist, the nematodes eventually evolve to kill the plants. The Nimitz and Velum treatments provides a permanent solution to the root-knot nematode problem.

Summary Statement

Two different treatments were used, Velum and Nimitz, in nematode-infested soil containing tomato plants to determine which treatment produces plants with the highest root-to-shoot ratio and prevents root galling from root-knot nematodes.

Help Received

Mr. Joe Nunez of the UC Cooperative Extension Kern County provide the nematode soil and general guidance for the project. Ms. Tamera Tomaschow allowed me to use the greenhouse.