Huma® Promax® and Zap® Decrease Charcoal Rot in Florida Strawberry, With Increased Yield and ROI of 10:1

Research Report

Conducted by: Natalia A. Peres, PhD, U of Florida, Gulf Coast Research and Education Center, Wimauma, Florida
Huma® Products: Promax®and Zap®

Background

Charcoal rot, caused by the soil-borne pathogen *Macrophomina phaseolina*, can be a significant threat to strawberry production. Two Huma® products, **Promax®** and **Zap®**, had previously been shown to be successful in managing soil-borne diseases in strawberries.

Objectives

The primary objectives of this study were to assess the efficacy of **Promax®** and **Zap®** in reducing the incidence and severity of charcoal rot in strawberry plants and to compare the yield of marketable fruit between treatments.

Materials & Methods

The trial was conducted at the University of Florida Gulf Coast Research and Education Center in Wimauma, Florida, using the 'Florida Medallion' strawberry variety. Bare-root green-top transplants of 'Florida Medallion' strawberries were planted on October 4 on four raised beds that were previously fumigated with Telone II (150 lb/A) and covered with black plastic mulch. Each bed represented a replication.

Inoculum of *M. phaseolina* was prepared on corn meal agar (CMA) plates. In order to expose the strawberry plants to the disease, three weeks after transplanting on October 24, toothpicks colonized with *M. phaseolina* were inserted near the plant crowns. This inoculation of plants and the **Promax®** plus **Zap®** applications formed the two treatments for this field research study.

Table 1. Treatment Details

Treatment	Amount/A	Method	Timing
Inoculated Control (IC)			
IC + Promax®	2 qt	Drip	1 week after inoculation (WAI)
IC + Zap®	2 qt	Drip	2 WAI
IC + Promax®	1 qt	Drip	5 WAI
IC + Zap®	1 qt	Drip	6 WAI
IC + Promax®	1 qt	Drip	10 WAI
IC + Zap®	1 qt	Drip	11 WAI

Table 1 outlines the timing, frequency and the applications of **Promax®** and **Zap®** products. Charcoal rot diseased incidence (DI) scale, expressed as the percentage of the total number of wilted, partially collapsed, or dead plants in relation to the total number of plants, was employed. The DI was evaluated weekly from November 7, 2023, to January 23, 2024. Yield data were collected from November 22, 2023, to January 25, 2024.

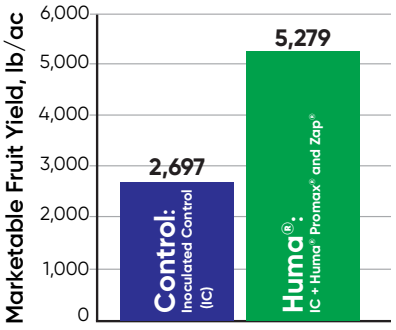

Figure 1. Yield Response of Marketable Strawberries to **Promax®** and **Zap®** Treatment

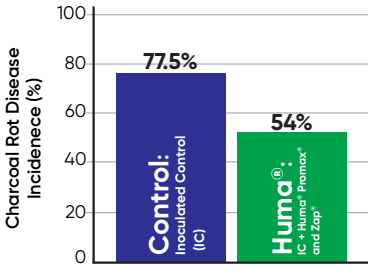

Figure 2. Percentage of Charcoal Rot Incidence of Strawberries with **Promax®** and **Zap®** Treatment

Results

The first signs of charcoal rot appeared 28 days after inoculation. The Inoculated Control treatment exhibited the highest DI (77.5%) with the yield of 2,697 lb/acre indicating severe disease progression. The **Promax®** and **Zap®** treatment, applied by drip, was effective in reducing DI to 54% with the marketable fruit yield of 5,279 lb/acre (Figures 1 and 2). Results were significant (Fisher's Protected LSD test [$\alpha = 0.05$]) when compared with the Control treatment. The combination of Huma treatment increased the yield by 96% over the Inoculated plants. No phytotoxic effects were observed with any of the treatments.

Conclusions

Even though the charcoal rot (*Macrophomina phaseolina*) disease was not completely eliminated here, the study demonstrated that **Promax®** and **Zap®** can be effective in decreasing the effects of charcoal rot in strawberry plants. The **Promax®** and **Zap®** applications resulted in nearly doubling the marketable fruit yield when compared to the Control treatment. This significant yield increase over the IC treatment gave a net gain of several thousands of dollars per acre with the ROI of more than 10 to 1. This finding suggests that integrating **Promax®** and **Zap®** into disease management practices could enhance strawberry production by reducing the effects of charcoal rot.

1331 W. Houston Avenue, Gilbert, AZ 85233 | 800.961.1220 | Fax 480.425.3061 | info@huma.us | www.huma.us