

**Early Season Plant Losses
(Do Plant Dip Treatments Work?)**

by

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Plant Growth Irregular, Not Vigorous



Plants Not Establishing, Dying



More *C. acutatum* Symptoms



Root Necrosis and Basal Crown Rot



Pathogens of Strawberry Transplants

- *Colletotrichum acutatum* – Root necrosis disease
- *Phytophthora* species – Phytophthora root & crown rot
- *Botrytis cinerea* – post-harvest storage rot, bud rot
- *Pestalotiopsis* species – root rot

All share something in common...

Plant Dip Experiments

- 4 similar experiments, one in 2013-14, 3 last season
- Each experiment was replicated in four beds, RCBD
- Transplants dipped 5 min & immediately set in plots
- Various measurements were recorded
 - Plant mortality
 - Plant growth and vigor
 - Yield of marketable fruit, or all ripe fruit (Feb. 2016)

Products tested

Product	Active ingredient(s)	Rate/100 gal	Labeled for plant dip?
Abound	azoxystrobin	8 fl oz	yes
Actinovate AG	Streptomyces lydicus	12 & 24 oz	yes
Fontelis	penthiopyrad	24 fl oz	no
Helena Prophyt	Potassium phosphite	2 pt	yes
Oxidate	hydrogen dioxide	2 qt	yes
Regalia	plant extract	4 qt, 2 qt	yes
Rovral	iprodione	2 pt	yes
Serenade ASO	Bacillus subtilis	4 qt	no
Switch	cyprodinil + fludioxonil	8 oz	yes
TerraGrow	biological	10 oz	?
Topsin 4.5 FL	thiophanate methyl	20 fl oz	no

Plant Dips in ABOUND vs Water Control

Measurement	2014-15	2015-16 Exp 1	2015-16 Exp 2	Sp 2016 Exp 3
Yield (g/plot)	1645 vs 1758 ns	2516 vs 2058 *	2100 vs 2203 ns	703 vs 561
Mortality (%)	23.8 vs 15.1 ns	2.6 vs 0.0 ns	6.2 vs 18.7 ns	nil
Plant size	7.1 vs 7.4 ns	23.3 vs 22.5 ns	26.7 vs 22.8 *	---
Flower blight ... (% plants)	NA	NA	NA	6.4 vs 16.3

Plant Dips in ACTINOVATE vs Water Control

Measurement	2014-15	2015-16 Exp 1	2015-16 Exp 2	Sp 2016 Exp 3
Yield (g/plot)	2775 vs 1758 *	2383 vs 2058 ns	2386 vs 2213 ns	612 vs 561 ns
Mortality (%)	2.5 vs 15.1 ns	2.6 vs 0.0 ns	5.0 vs 18.7 ns	nil
Plant size	8.5 vs 7.4 ns	23.1 vs 22.5 ns	25.9 vs 22.8 ns	---
Flower blight (% plants)	NA	NA	NA	15.0 vs 16.3

Plant Dips in SWITCH vs Water Control

Measurement	2014-15	2015-16 Exp 1	2015-16 Exp 2	Sp 2016 Exp 3
Yield (g/plot)	2920 vs 1758 *	1761 vs 2058 ns	2086 vs 2213 ns	548 vs 561 ns
Mortality (%)	5.0 vs 15.1 ns	8.2 vs 0.0 *	6.2 vs 18.7 ns	nil
Plant size	8.5 vs 7.4 ns	19.2 vs 22.5 ns	23.8 vs 22.8 ns	---
Flower blight ... (% plants)	NA	NA	NA	0.0 vs 16.3

Plant Dips in OXIDATE vs Water Control

Measurement	2014-15	2015-16 Exp 1	2015-16 Exp 2	Sp 2016 Exp 3
Yield (g/plot)	1579 vs 1758 ns	2643 vs 2058 *	2351 vs 2213 ns	515 vs 561 ns
Mortality (%)	17.5 vs 15.1 ns	6.4 vs 0.0 *	21.2 vs 18.7 ns	nil
Plant size	7.6 vs 7.4 ns	24.8 vs 22.5 ns	24.9 vs 22.8 ns	---
Infected plants (%)	NA	NA	NA	6.3 vs 16.3

Plant Dips in FONTELIS vs Water Control

Measurement	2014-15	2015-16 Exp 1	2015-16 Exp 2	Sp 2016 Exp 3
Yield (g/plot)	---	2421 vs 2058 ns	2275 vs 2213 ns	---
Mortality (%)	---	0.0 vs 0.0 ns	6.2 vs 18.7 ns	nil
Plant size	---	23.0 vs 22.5 ns	26.0 vs 22.8 ns	---
Infected plants (%)	NA	NA	NA	6.3 vs 16.3

Summary

- Plant dips do not always produce beneficial effects
- Abound significantly increased yields in 2 out of 4 trials and is effective against sensitive strains of *C. acutatum*.
- Actinovate gave the most consistent increases in yield and appears to enhance plant survival through establishment.
- Switch may be highly effective against root necrosis disease caused by *C. acutatum* and in reducing inoculum that infects flowers early in the season. However...
- Fontelis may be slightly beneficial, but statistically significant results were not found. Other members of the SDHI class of fungicides should be tested.

Thank you

