

# Evaluation of new fungicides as potential management tools for *Phytophthora* crown and root rot on peppers

Michael E. Matheron

Extension Plant Pathologist & Professor

Yuma Agricultural Center



## The disease:

Phytophthora root and crown rot on peppers





# Greenhouse studies

- Soil naturally infested with *P. capsici* collected from diseased plants in the field



# Greenhouse studies

- Field soil mixed with sand in large container, then dispensed into 500 ml capacity pots
- A bell pepper seedling planted in each pot



# Greenhouse studies

- Tested products applied to soil as a drench in 200 ml of water per pot
  - 2006: At transplanting, then at 3-week intervals
  - 2007: At transplanting, then at 2-week intervals
- Each pot was placed in a shallow container (4 cm deep), which was filled with water daily
- Plants maintained in greenhouse for ~ 2 months

# Greenhouse studies

- The following data was collected either during or at the end of the experiment
  - **Duration of plant survival**
  - **Fresh weight of plant shoots and roots**
  - **Incidence of crown rot**

## Greenhouse studies

- In 2006, experiment ran from Sep 26 to Nov 27
  - Soil temperature (4 inch depth) : range 11 to 40°C, mean 25°C
- In 2007, experiment ran from Sep 26 to Dec 2



## Inoculated field trial - 2007

- Bell pepper plants 'Aristotle' transplanted into the field Sep 20 in a single row on beds 102 cm apart
- Each treatment consists of five replicate plots, each 4.6 m long, established in randomized complete block design
- Inoculated plots each received 150 cm<sup>3</sup> of vermiculite infested with *P. capsici*, placed 5 cm deep and 8 cm from plant stems on Oct 11
- Tested products applied to soil and base of plants as a drench in 750 ml of water per 15-plant plot on Oct 11 and Nov 1

# Inoculated field trial - 2007

- Pepper plants are flood-irrigated weekly



- Final disease incidence recorded at the end of Nov by counting the number of dead plants per plot

# Products evaluated: 2006 and 2007

Product	Year evaluated		Active ingredient	Source
	2006 G	2007 GF		
Forum	X	X	Dimethomorph	BASF
IR-6141	X	X	Kiralaxyl	Isagro
Omega	X	X	Fluazinam	ISK
Presidio	X	X	Fluopicolide	Valent
ProPhyt	X	X	Phosphorous acid salt	Helena
Ranman	X	X	Cyazofamid	ISK
Reason + Previcur Flex	X	X	Fenamidone + Propamocarb	Bayer
Remedier	X	X	<i>Trichoderma</i>	Isagro
Revus	X	X	Mandipropamid	Syngenta
Ridomil Gold	X	X	Mefenoxam	Syngenta
SA-110201	X	X	?	Sipcam

# Summary of product efficacy when applied as a soil drench to manage *P. capsici* on peppers

Treatment	Rate of prod. per hectare	Percent dead plants in trial			Active ingredient
		2006 G	2007 G	2007 F	
Remedier	2,468 g	0	15	44	<i>Trichoderma</i>
Omega 500F	1,754 ml	30	20	37	Fluazinam
Ranman 400SC	402 ml	20	25	52	Cyazofamid
SA-110201 10%SC	2,339 ml	20	35	56	?
Presidio 4FL	585 ml	40	25	52	Fluopicolide
Reason + Previcur Flex	599 ml + 1,402 ml	10	35	76	Fenamidone + Propamocarb
Ridomil Gold	1,170 ml	30	50	51	Mefenoxam
ProPhyt	4,676 ml	60	45	56	Phosphorous acid salt
Forum	438 ml	50	35	81	Dimethomorph
Revus	1,170 ml	60	35	79	Mandipropamid
IR-6141 50WP	2,244 g	40	75	81	Kiralaxyl
Nontreated plants	-----	70	75	77	-----

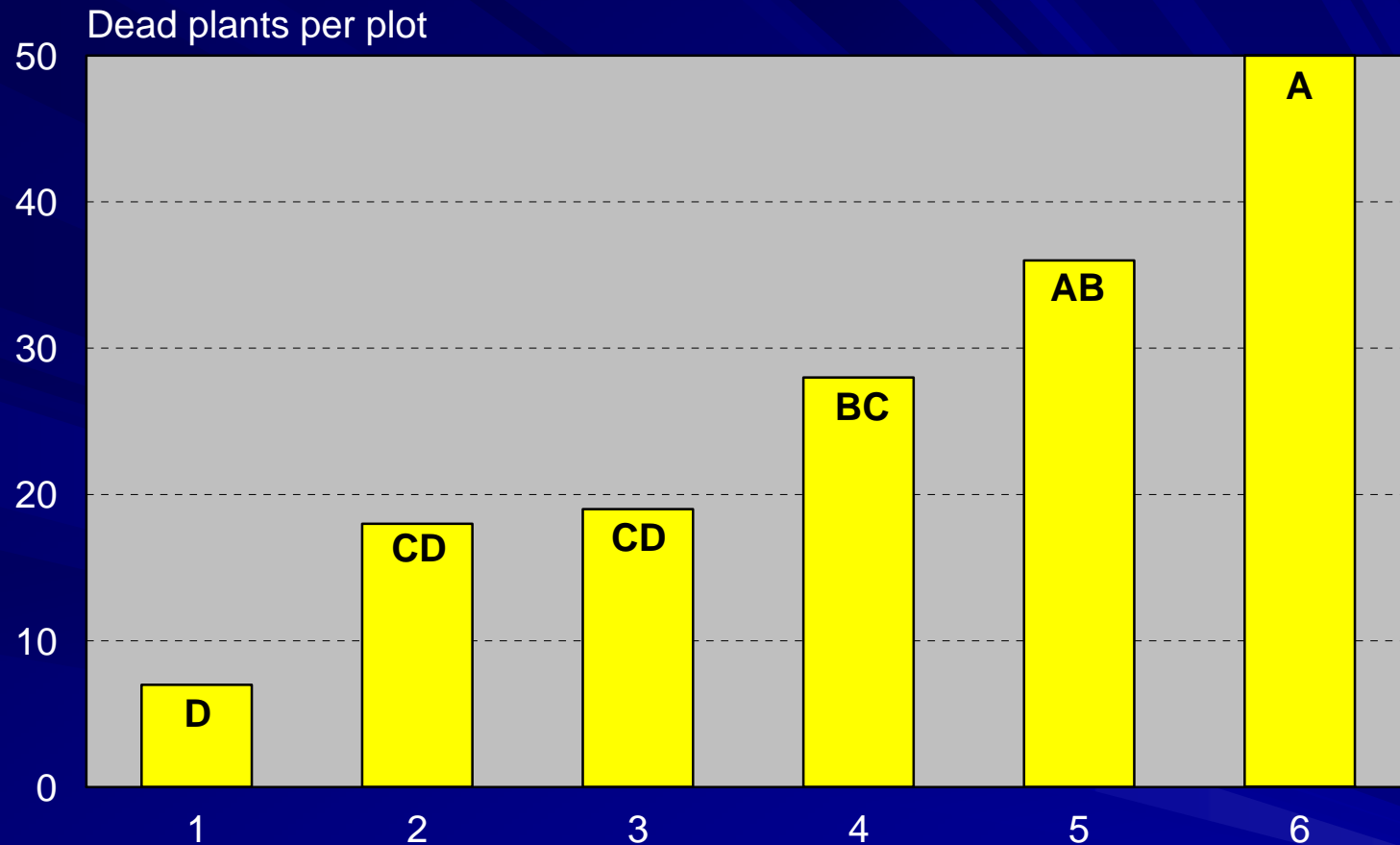
# Ranking of product efficacy when applied as a soil drench to manage *P. capsici* on peppers

Treatment	Rate of product per hectare	% dead plants (3 trials)	Active ingredient	FRAC Code
Remedier	2,468 g	20	<i>Trichoderma</i>	NC
Omega 500F	1,754 ml	29	Fluazinam	29
Ranman 400SC	402 ml	32	Cyazofamid	21
SA-110201 10%SC	2,339 ml	37	?	
Presidio 4FL	585 ml	39	Fluopicolide	43
Reason + Previcur Flex	599 ml + 1,402 ml	40	Fenamidone + Propamocarb	11 28
Ridomil Gold	1,170 ml	44	Mefenoxam	4
ProPhyt	4,676 ml	54	Phosphorous acid salt	33
Forum	438 ml	55	Dimethomorph	40
Revus	1,170 ml	58	Mandipropamid	40
IR-6141 50WP	2,244 g	65	Kiralaxyl	4
Nontreated plants	-----	74	-----	-----



**Field trial in grower's field**

# Efficacy of treatment programs with Revus



1 = Revus + Kocide D F (BCEF), Ridomil Gold Copper (DG)

2 = Revus + Kocide 3000 (BCEF), Ridomil Gold Copper (DG)

3 = Revus + Kocide D F (BDF), Ridomil Gold Copper (CEG)

4 = Revus (BDF), Ridomil Gold Copper (CEG)

5 = Prophyt

6 = Nontreated control

Treatments 1-5 received soil application of Ridomil Gold at start of trial

# Efficacy of treatment programs containing Revus: Phytophthora blight on chile pepper



Untreated plants



Ridomil Gold (A)  
Revus + Kocide DF (BCEF)  
Ridomil Gold Copper (DG)