

Managing Fungal Gummosis on Peach

USDA and UGA Cooperating

Cooperators:

- Larry Pusey, USDA-ARS, Wenatchee, WA
- Paul Bertrand, UGA, Tifton, GA
- Chuck Reilly, USDA-ARS, Byron, GA
- Mike Hotchkiss, USDA-ARS, Byron, GA













Causal Agents:

- *Botryosphaeria dothidea*

Fungal Gummosis

Blister Canker

- *Botryosphaeria obtusa*

- *Botryosphaeria rhodina*

1990

Gummosis Field Trial

Spray Treatments:

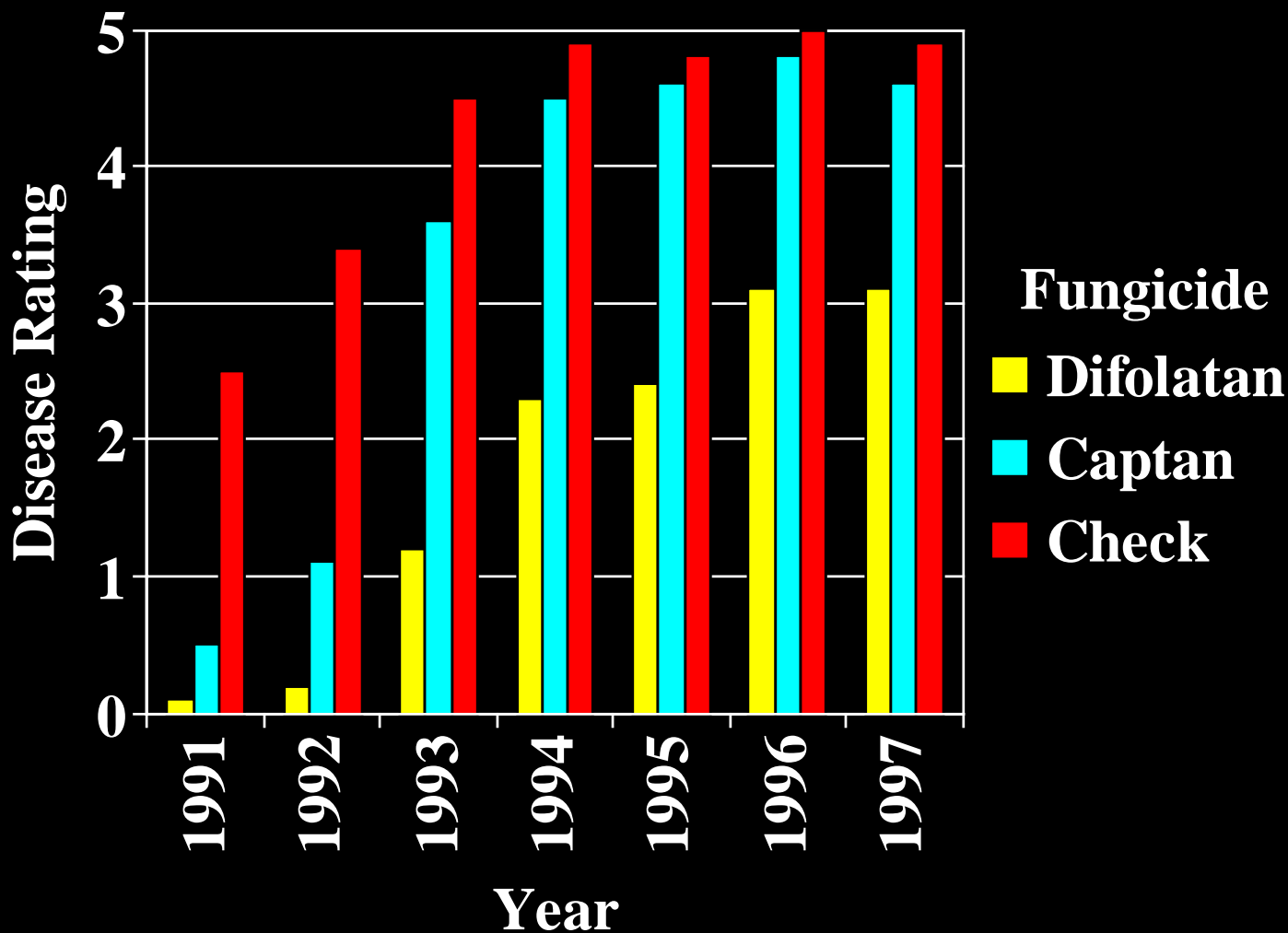
- Difolatan (Captafol)
- Captan
 - *Tenn-Cop*
 - *Whiton Powder*
- Check
 - *Check + Bd infected prunings*

Gummosis Rating Scale:

0. No gum or lesions
1. 1-2 gum sites on trunk/scaffolds
2. 3-10 gum sites on trunk/scaffolds
3. 11-25 gum sites on trunk/scaffolds
4. 26-50 gum sites on trunk/scaffolds
5. >50 gum sites on trunk/scaffolds

Gummosis Field Trial

Disease Ratings



Scion=Summergold, Est. S'90 @ 6.1 x 6.1 m

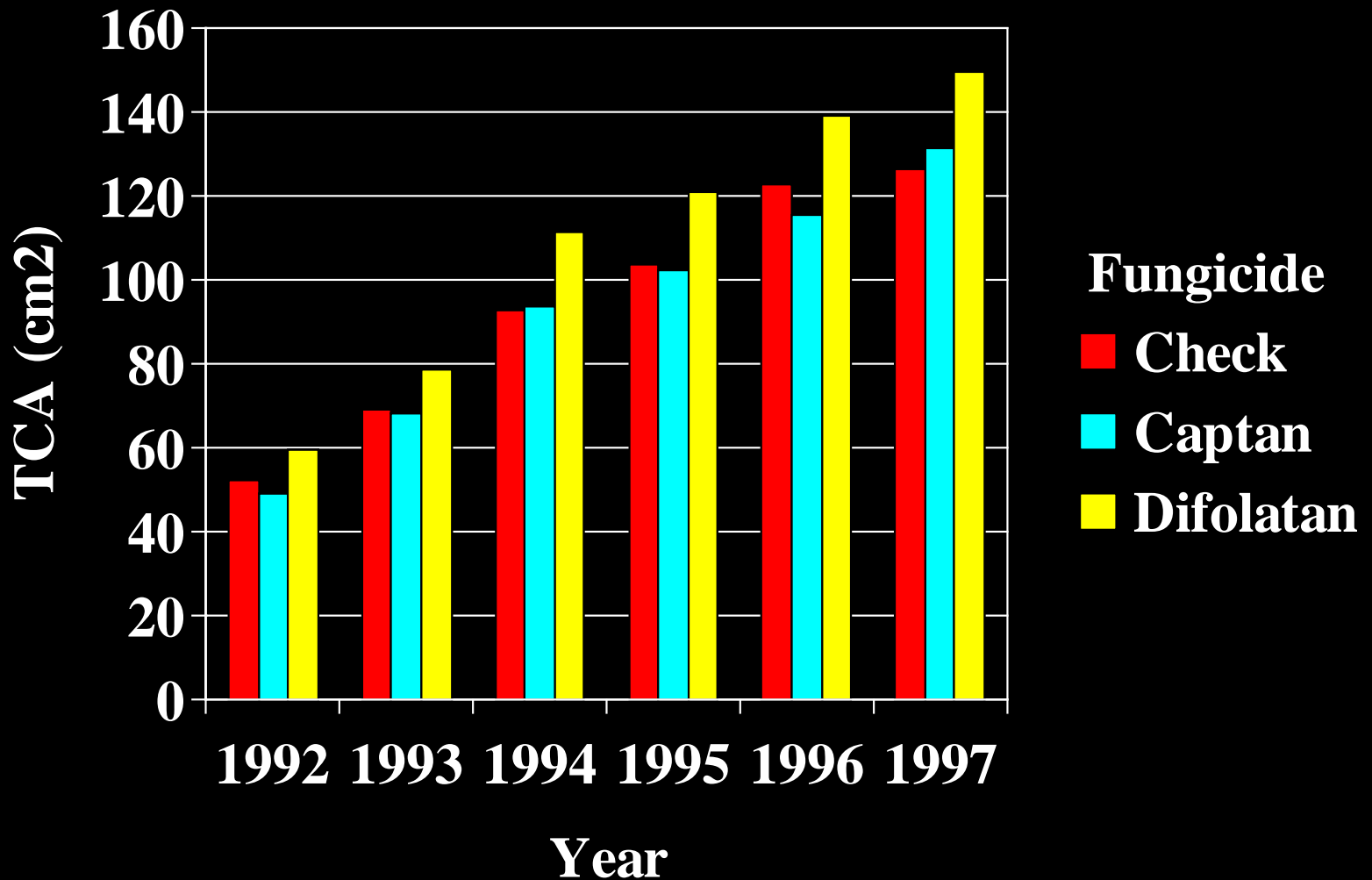


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Gummosis Field Trial

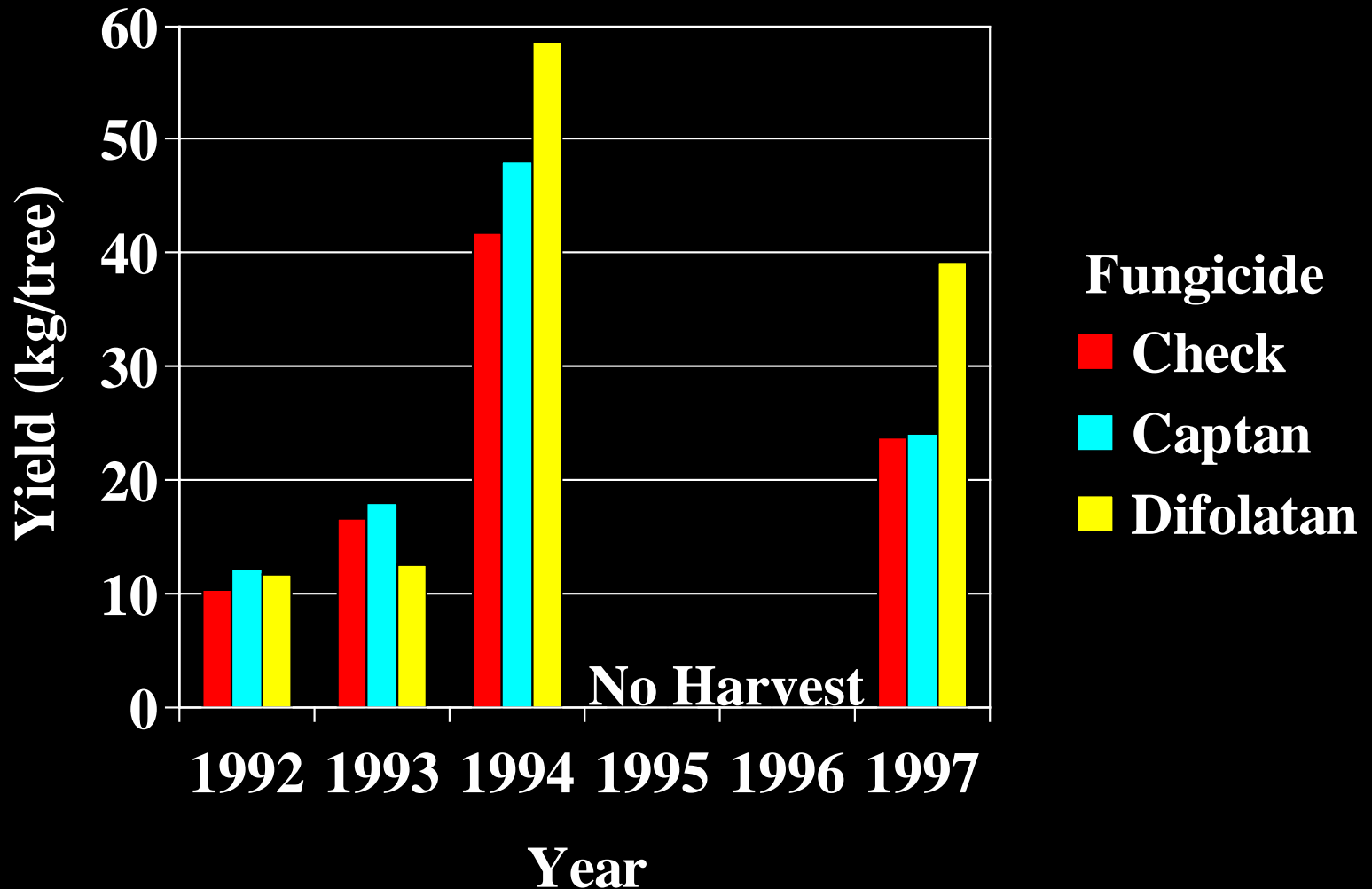
Trunk Cross-Sectional Area



Scion=Summergold, Est. S'90 @ 6.1 x 6.1 m

Gummosis Field Trial

Annual Yield



Scion=Summergold, Est. S'90 @ 6.1 x 6.1 m

Conclusions:

- Fungicide sprays can work
- Controlling gummosis
increases growth and yield

Field Testing
Under
High Inoculum Pressure













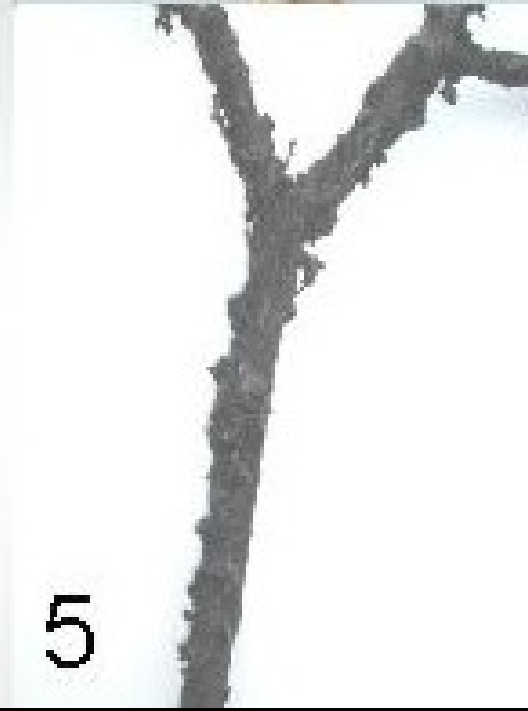
SEP 26 '91





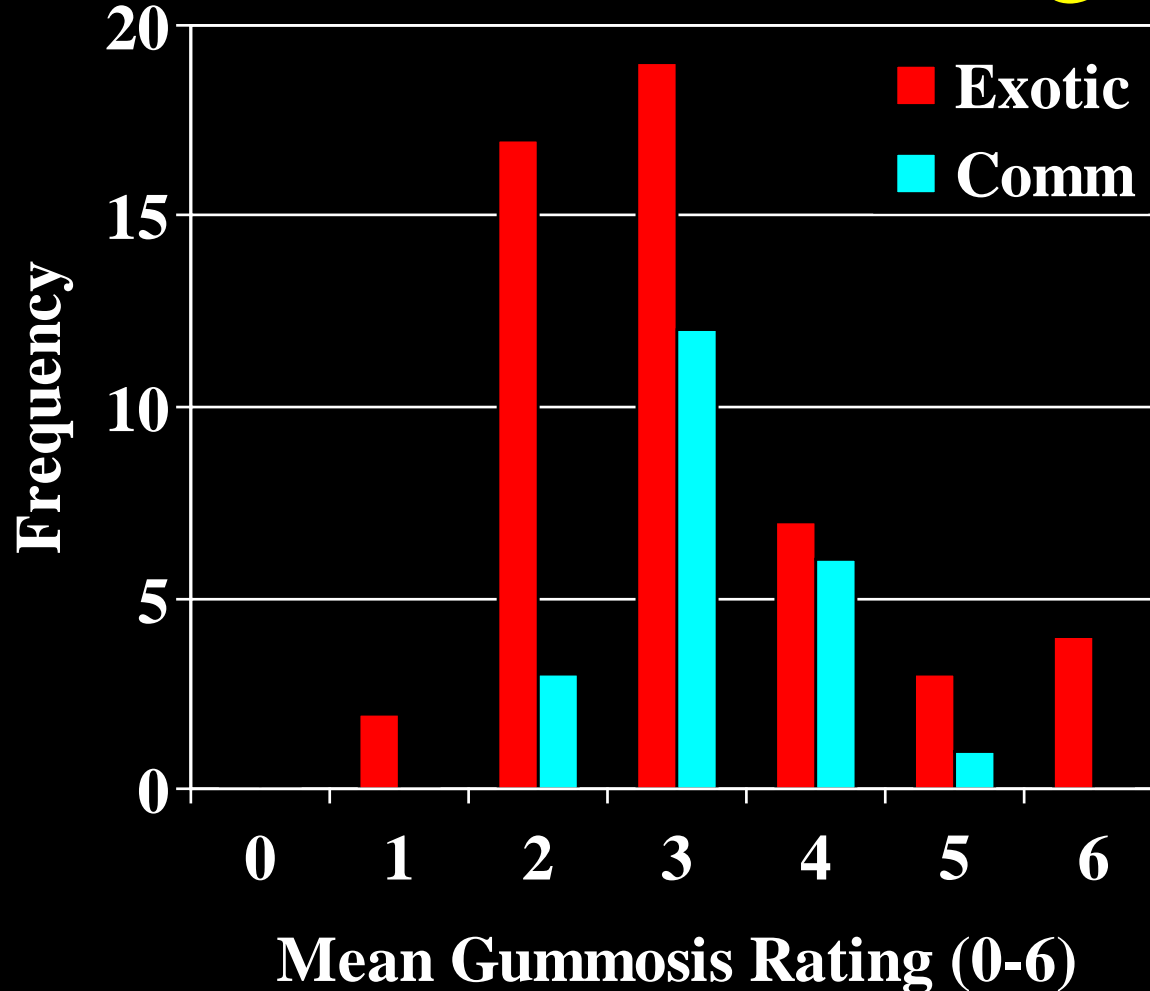
Gummosis Rating Scale:

- 0=No gumming
- 1=Light (*few gum spots, mostly on trunk*)
- 2=Medium
(*few to many gum spots on trunk/scaffolds*)
- 3=Medium-Heavy
(*many gum spots, some large, on trunk/scaffolds*)
- 4=Heavy
(*many large gum spots on trunk/scaffolds*)
- 5=Severe
(*gum spots coalescing, tree or limbs dying*)



Varietal Differences in Susceptibility to Fungal Gummosis

Frequency Distribution Gummosis Ratings



after Okie and Reilly, 1983



Low Gummosis Susceptibility

Bounty

Harvester

Redskin

Cary Mac

June Gold

Springcrest

Flordaking

Juneprince

Springprince

Goldprince

Majestic

Sunprince

Gulfprince

Suwanee

Low Gummosis Susceptibility

Bounty

Harvester

Redskin

Cary Mac

June Gold

Springcrest

Flordaking

Juneprince

Springprince

Goldprince

Majestic

Sunprince

Gulfprince

Suwanee

Moderate Gummosis Susceptibility

Babygold #5

Fireprince

Loring

Big Red

Flordacrest

Redglobe

Coronet

GaLa

Redhaven

Cresthaven

Gulfcrest

So. Pearl

Dixiland

Jefferson

Sunbrite

Empress

Surecrop

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High Gummosis Susceptibility

Autumnprince

Gulfking

Summergold

Blazeprince

Julyprince

Summerprince

Contender

Monroe

Sunland

Flameprince

O'Henry

Sureprince

Flordadawn

Parade

Topaz

Gulfcrimson

Rubyprince

Winblo

Scarletprince

High Gummosis Susceptibility

Autumnprince

Gulfking

Summergold

Blazeprince

Julyprince

Summerprince

Contender

Monroe

Sunland

Flameprince

O'Henry

Sureprince

Flordadawn

Parade

Topaz

Gulfcrimson

Rubyprince

Winblo

Scarletprince

Spray Trials:

- Conventional Fungicides
- Resistance Elicitors
- Barriers

1998 Spray Trial

<u>Chemical (10x)</u>	<u>Rating (0-5)</u>
Water Check	3.5 a
Actiguard	3.4 a
Garlic	3.3 a
Aliette	2.7 b
Orbit	2.4 b
Captan/Orbit	2.2 b
Abound	2.2 b
Orbit/Paint (1x)	1.3 c
Difolatan	0.9 cd
Orbit/Paint (3x)	0.8 d

2004 Spray Trial

<u>Chemical (3x)</u>	<u>Rating (0-5)</u>	<u>Waller</u>
Lexx-A-Phos	4.6	A
Bravo	4.4	AB
MR Paint 3x	4.2	AB
Difolatan	4.2	AB
Water Check	4.1	AB
MR Paint 1x	4.1	AB
Ni-Plus	4.1	AB
Aliette	4.0	B
Redskin	2.1	C
MSD	0.6	

2008 Spray Trial

<u>Chemical (3x)</u>	<u>Rating (0-5)</u>	<u>Waller</u>
Botran	3.6	A
Ferbam	3.5	A
Orbit	3.4	AB
Captan	3.3	AB
Bravvo	3.3	AB
Aliette	3.3	AB
Rovral	3.2	AB
Vanguard	3.2	AB
Ni-plus	3.1	ABC
Abound	3.0	ABC
Water Check	2.9	ABC
Topsin M	2.9	ABC
FNX-100	2.9	ABC
Ziram	2.9	ABC
Sulfur	2.8	ABC
Non-MR Paint 2x	2.4	BCD
Difolatan	2.1	CD
MR Paint 2x	1.8	DE
Non-MR Paint 1x	1.8	DE
MR Paint 1x	1.7	DE
Redskin	1.3	E
MSD	1.0	

2008 Spray Trial

<u>Chemical (3x)</u>	<u>Rating (0-5)</u>	<u>Cluster</u>
Botran	3.6	A
Ferbam	3.5	A
Orbit	3.4	A
Captan	3.3	A
Bravvo	3.3	A
Aliette	3.3	A
Rovral	3.2	A
Vanguard	3.2	A
Ni-plus	3.1	A
Abound	3.0	A
Water Check	2.9	A
Topsin M	2.9	A
FNX-100	2.9	A
Ziram	2.9	A
Sulfur	2.8	A
<hr/>		
Non-MR Paint 2x	2.4	B
Difolatan	2.1	B
MR Paint 2x	1.8	B
Non-MR Paint 1x	1.8	B
MR Paint 1x	1.7	B
Redskin	1.3	B
MSD	1.0	P~0.0

2008 Spray Trial

<u>Chemical (3x)</u>	<u>Rating (0-5)</u>	<u>Cluster</u>
Water Check	2.9	A
Non-Mildew Res. Paint 2x	2.4	B
Difolatan	2.1	B
Mildew Res. Paint 2x	1.8	B
Non-Mildew Res. Paint 1x	1.8	B
Mildew Res. Paint 1x	1.7	B
Redskin	1.3	B











Managing Gummosis:

- Consider Inoculum Levels
- Variety Selection
- Reduce Inoculum
 - Detailed Pruning
 - Orchard Sanitation
- Postharvest Irrigation
- Latex Paint?

Ongoing Work:

- Economic Study of Latex Paint
- Evaluate Selections and Releases
- Evaluate Breeding Lines
- Develop Molecular Markers
- Evaluate Other Paints and Coatings



ASAP

SOUTHEASTERN
FRUIT AND TREE NUT
RESEARCH STATION
AGRICULTURAL RESEARCH
SERVICE
FOR THE FUTURE

Nothing is Impossible

... as long as someone else
has to do it!

Resistance Breeding:

- Evaluate Selections/Releases
- Evaluate Breeding Lines
- Develop Molecular Markers

Marker Development:

- Cross Susceptible x Resistant Parents
- Self F_1 hybrid
- Score F_2 for disease response
- Perform BSA to identify markers

Varieties Tested:

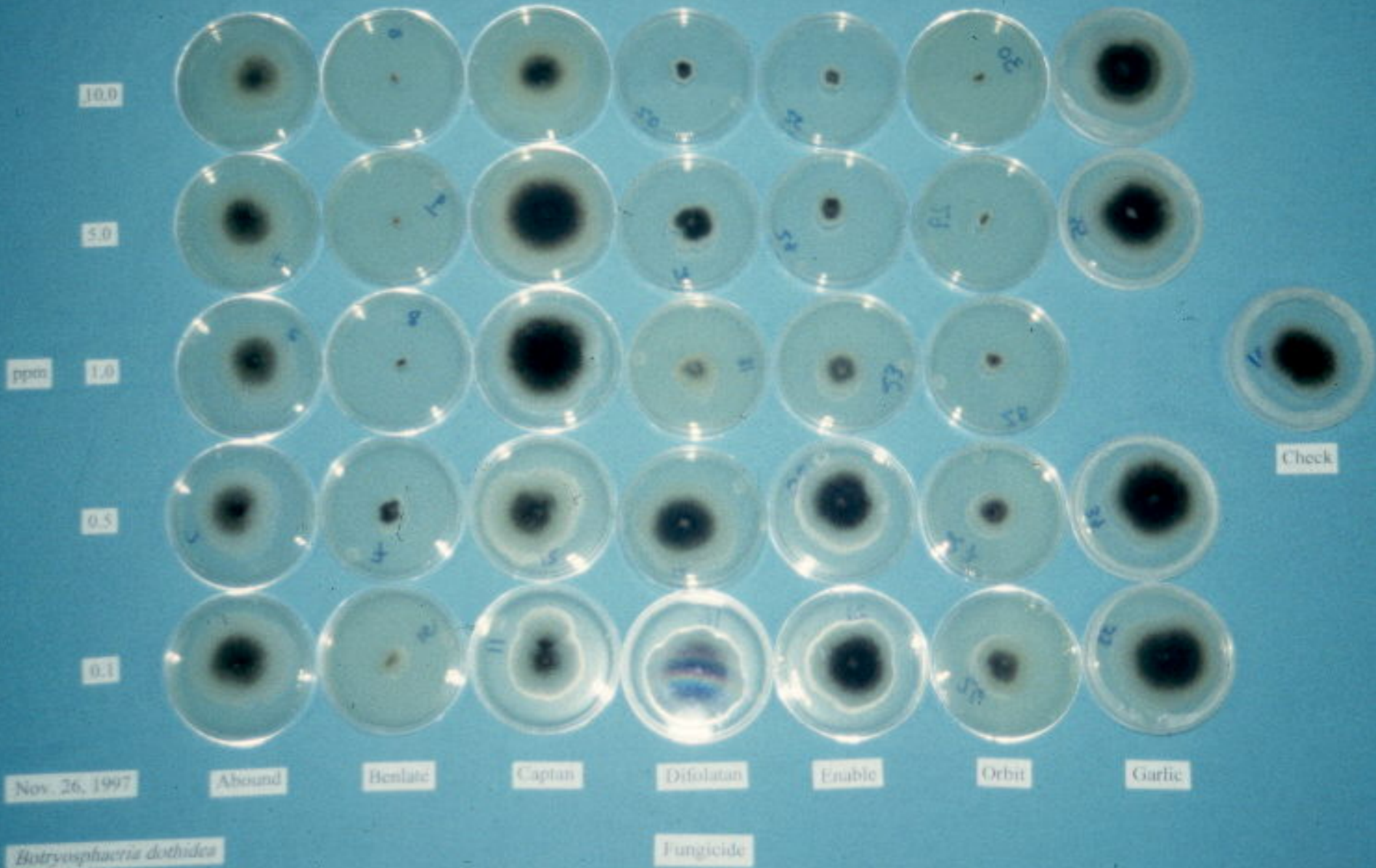
Autumnprince	Empress	Gulfking	Monroe	Summergold
Babygold #5	Fireprince	Gulfprince	O'Henry	Summerprince
Big Red	Flameprince	Harvester	Parade	Sunbrite
Blazeprince	Flordacrest	Jefferson	Redglobe	Sunland
Bounty	Flordadawn	Julyprince	Redhaven	Sunprince
Cary Mac	Flordaking	June Gold	Redskin	Surecrop
Contender	GaLa	Juneprince	Rubyprince	Sureprince
Coronet	Goldprince	Loring	So. Pearl	Suwanee
Cresthaven	Gulfcrest	Majestic	Springcrest	Topaz

Ongoing Work:

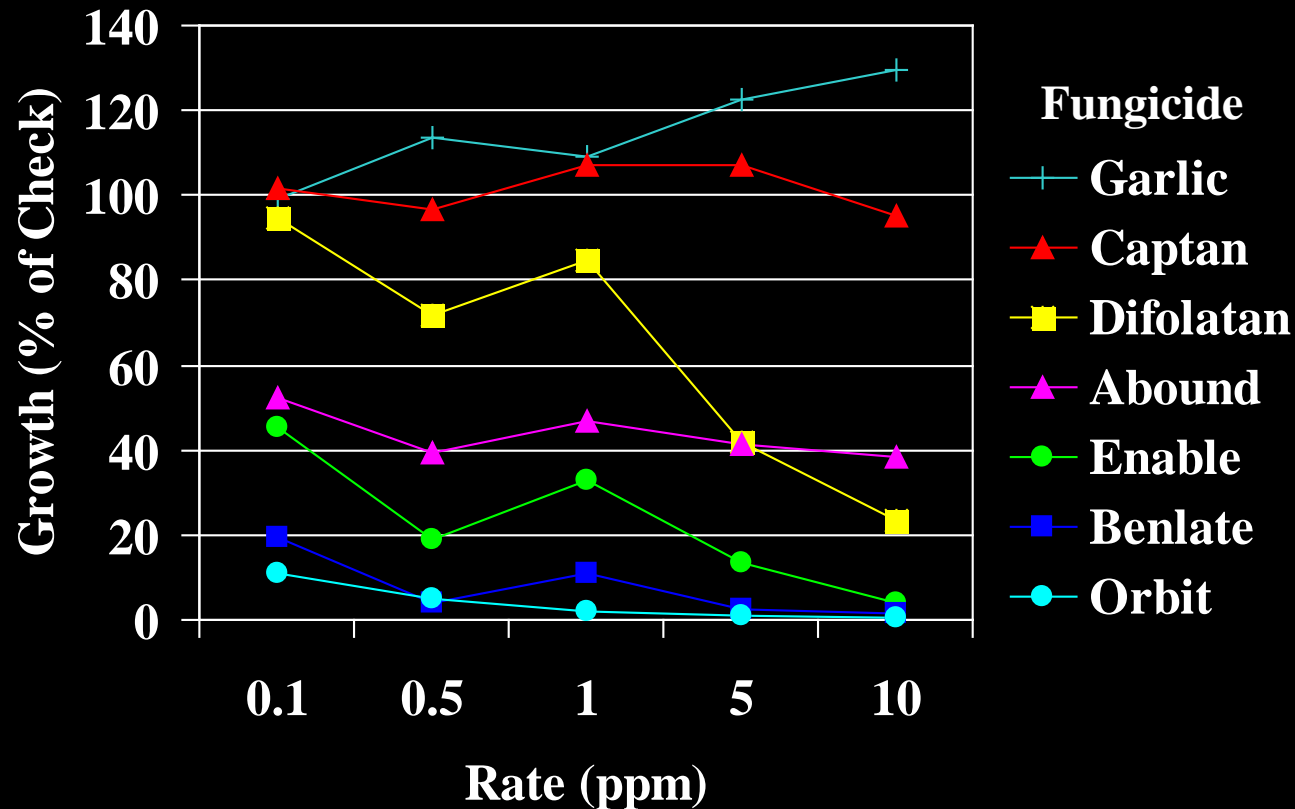
- Laboratory Fungicide Tests
- High Inoculum Field Trials

Lab Fungicide Tests

- Inhibition of Mycelial Growth
- Inhibition of Spore Germination



Effect of fungicides on *B. dothidea* mycelium growth

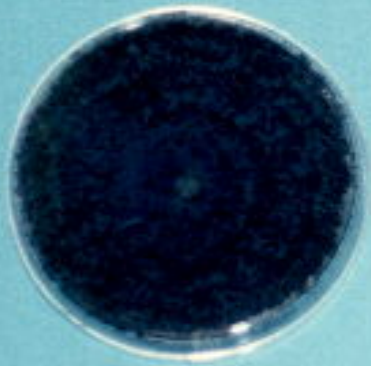


Mycelial Growth (BD-67): 1/98 (2nd run)

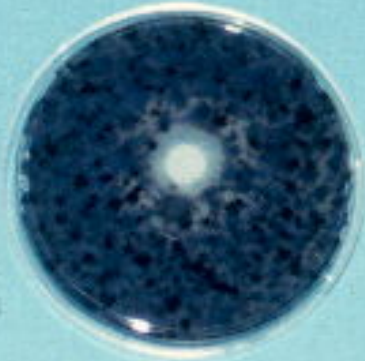
Typical Results:

Inhibition of Spore Germination

Botryosphaeria dothidea



Check



0.1



0.5



1.0



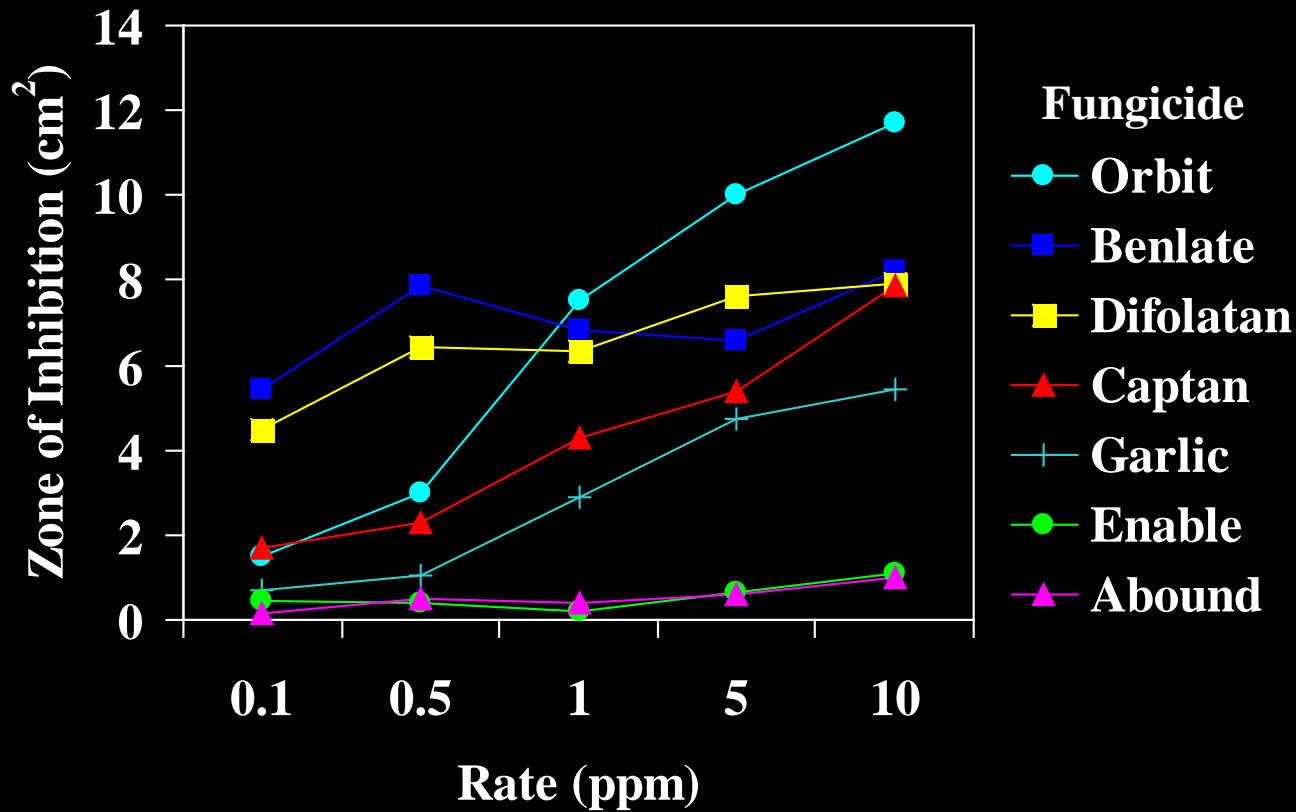
5.0



10.0

Fungicide Concentration (ppm)

Effect of fungicides on *B. dothidea* spore germination



Spore Germination (BD-67): 1/98 (2nd run)

Incidence Factors:

- Inoculum Levels
- Variety Selection
- Drought Stress

Control Strategies:

- Detailed Pruning
- Orchard Sanitation
- Irrigation
- Spray Program?
- Genetic Resistance?