

# Soybean Rust Control With MANA Fungicides

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# MANA

Makhteshim Agan of North America, Inc.

A Division of the  
Makhteshim-Agan Industries Group



# MAI Profile

- World's leading manufacturer of generic agricultural chemical products
- One of the leading herbicide, insecticide and fungicide manufacturers in the world
- Broad product portfolio – over 70 active ingredients
- Ranked 7<sup>th</sup> in the world for agricultural chemical companies
- 2004 Sales \$1.5 B

# MANA Portfolio of Products – 2006

## *Insecticides*

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ABBA™ abamectin  
Alias™ imidacloprid  
Apollo® ovicide/miticide clofentezine  
Azinphos-methyl  
Chlorpyrifos (Pyrinex®)  
Diazinon  
Dicofol  
Fanfare™ bifenthrin  
Pasada™ imidacloprid  
Rimon® novaluron (via Chemtura)  
Silencer™ lambda-cyhalothrin  
Thionex® endosulfan

## *Fungicides*

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Bumper® propiconazole  
Captan (Merpan®)  
Chlorothalonil (Equus®)  
Folpet (Folpan 80WDG)  
Imazalil  
Orius™ tebuconazole  
TM 85 thiophanate methyl  
Agricultural Streptomycin sulfate

## *Herbicides*

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Arrow™ clethodim  
Atrazine  
Diuron  
Double Team™ acetochlor + atrazine  
registration pending  
First Act™ acetochlor registration pending  
Fluometuron (Cotoran)  
Galigan®/OxiFlo 2EC oxyfluorfen  
Glyphogan™ glyphosate  
Metgard® metsulfuron-methyl  
Metribuzin  
Oryzalin  
Parallel metolachlor + safener  
Parallel PCS metolachlor  
Parallel Plus metolachlor + atrazine +  
safener registration pending  
Pramitol® prometon  
Prometryn (Cotton-Pro, Vegetable Pro)  
Triflurex® trifluralin  
Valuron® metsulfuron-methyl



**MANA**

Generic Crop Protection

# MANA Soybean Fungicides

	<b>Bumper 41.8EC</b>	<b>Equus 720 SST</b>	<b>Orius 3.6F</b>	<b>Thiophanate Methyl 85WDG</b>
	Propiconazole	Chlorothalanil	Tebuconazole	Thiophanate Methyl
<b>Anthraco nose</b>		X		X
<b>Aerial Blight</b>				X
<b>Diaporthe Pod/ Stem Blight</b>		X		X
<b>Frogeye Leaf Spot</b>		X		X
<b>Purple Seed Stain</b>		X		X
<b>Cercospora Leaf Blight</b>		X		
<b>Septoria Brown Spot</b>		X		X
<b>Stem Canker</b>		X		
<b>Soybean Rust</b>	X	X	X	
<b>Sclerotinia</b>				X



- Bumper: Propiconazole
- Chemical Class: Triazole
- Formulations: 41.8% Emulsifiable Concentrate
- Package Sizes: 1 Quart, 1 Gallon
- REI: 24 hours     PHI = Through R5 growth stage
- Application Rates: 4 – 8 oz/A pts
- Application Interval: 14 days
- # of Applications: 2 per year – Up to 12 oz/A/season
- Recommended Spray Program: Early Season Applications – Prior to or as Rust Starts to be Detected – Alone or in Tankmixes with Chlorothalonil or Strobis



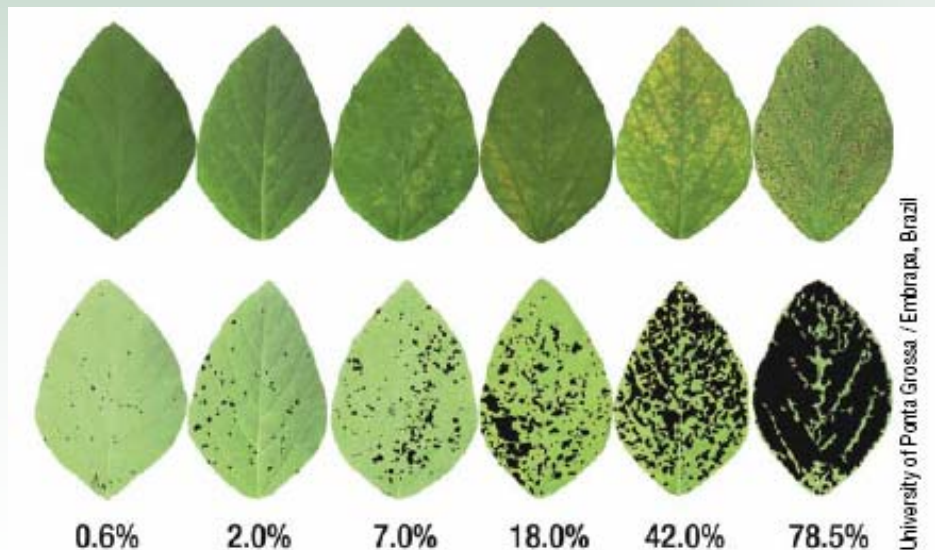
- Equus 720 SST: Chlorothalonil
- Chemical Class; Chloronitrile
- Formulations: 6lb/G Flowable
- Package Sizes: 2.5 G
- REI:12 hours                      PHI = 6 weeks
- Application Rates: 1.37 – 2.5 pts
- Application Interval: 14 days
- # of Applications: 3 Applications/Year - Up to 6 pts/A/Season
- Recommended Spray Program: Early Season Applications – Prior to or as Rust Starts to be Detected – Alone or in Tankmixes with Triazoles or Strobis
- Equus 82.5 DF will be available in 2006 – Rates of AI per Acre will be the same as Equus 6F



- Orius: Tebuconazole – 1<sup>st</sup> Post-Patent Tebuconazole to enter the US Market
- Chemical Class: Triazole
- Formulations: 3.6 lb/G Flowable
- Package Sizes: 2.5 G
- REI:12 hours                      PHI = 21 weeks
- Application Rates: 3 – 4 oz/A
- Application Interval: 10 - 21 days
- # of Applications: 2 per year - Up to 0.225 lbai/A/Season
- Recommended Spray Program: Preventatively or Curatively

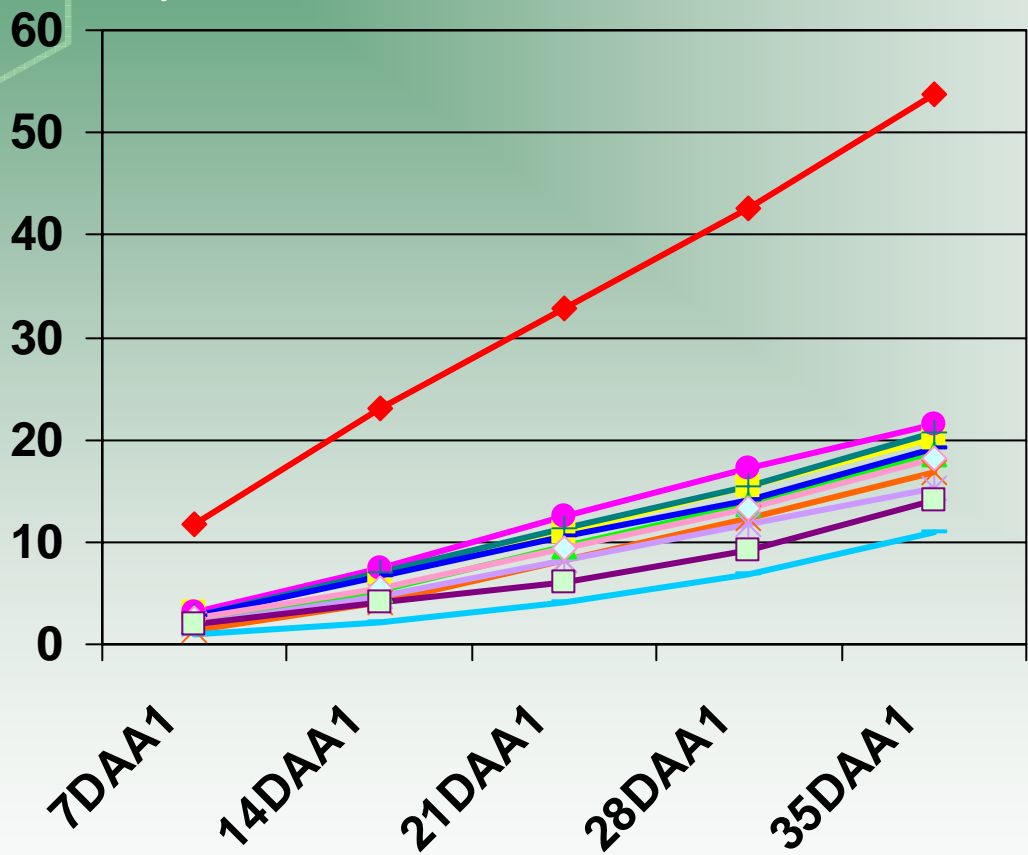
# MANA Soybean Rust Small Plot Study Summary

- Studies Conducted in Brazil
- Small Plot Replicated Studies (4 reps)
- Severity Evaluations Made on 20 Mid-canopy Leaflets Per Plot at 7, 14, 21, 28 and 35 Days After the 1<sup>st</sup> Application
- Trials Evaluated Products Alone, in Tankmixes and in Sequential Treatments
- Applications were made with CO2 BP Sprayer at 14 Day Intervals



# MANA Fungicides vs Soybean Rust

## Severity Evaluation

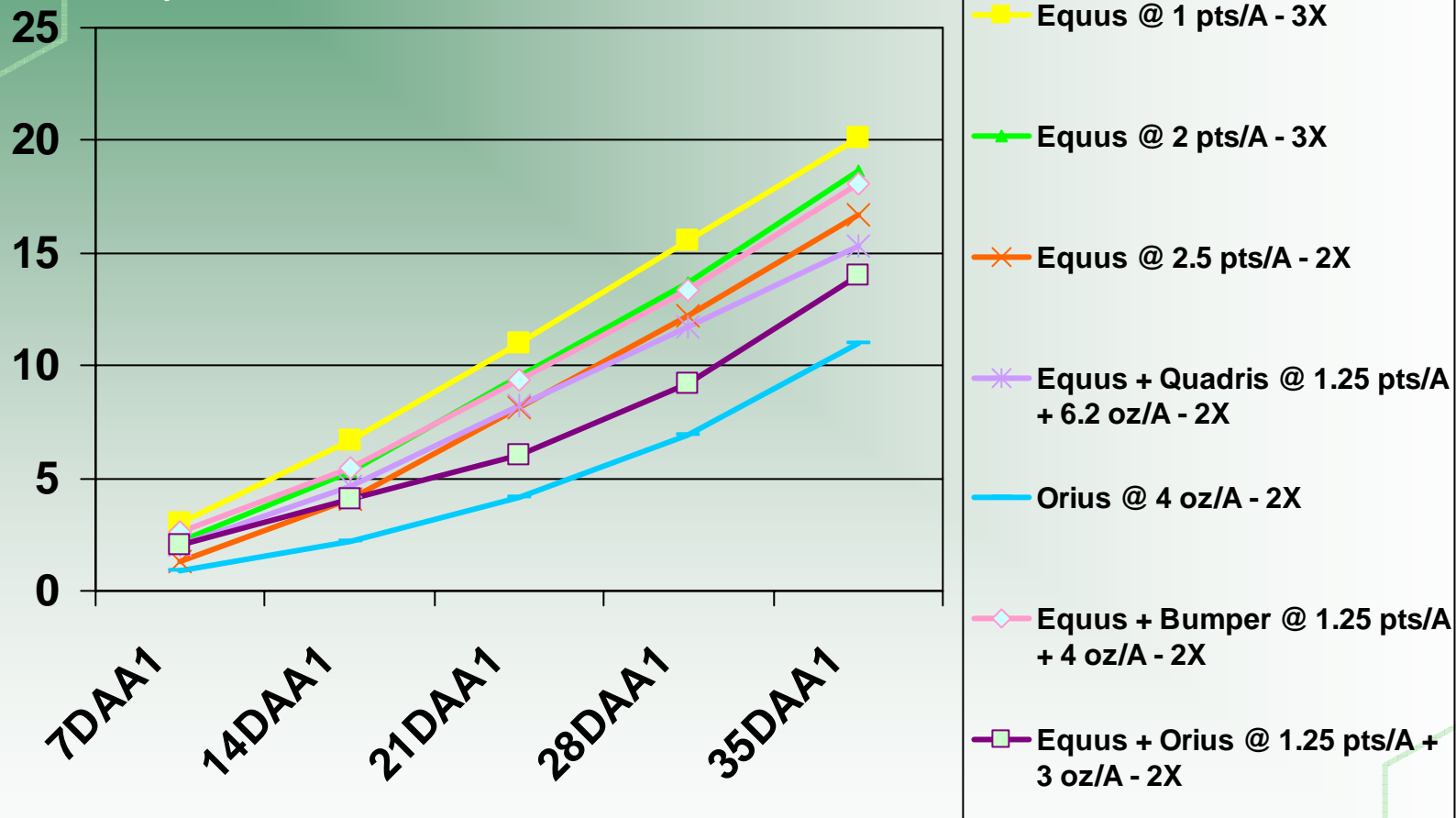


- ◆ Untreated
- Equus @ 1 pts/A - 3X
- ▲ Equus @ 2 pts/A - 3X
- ✕ Equus @ 2.5 pts/A - 2X
- ✱ Equus + Quadris @ 1.25 pts/A + 6.2 oz/A - 2X
- Bumper @ 4 oz/A - 2X
- + Bumper @ 6 oz/A - 2X
- Bumper @ 4 oz/A fb 6 oz/A
- Orius @ 4 oz/A - 2X
- ◇ Equus + Bumper @ 1.25 pts/A + 4 oz/A - 2X
- Equus + Orius @ 1.25 pts/A + 3 oz/A - 2X

Mean Across 3 Studies

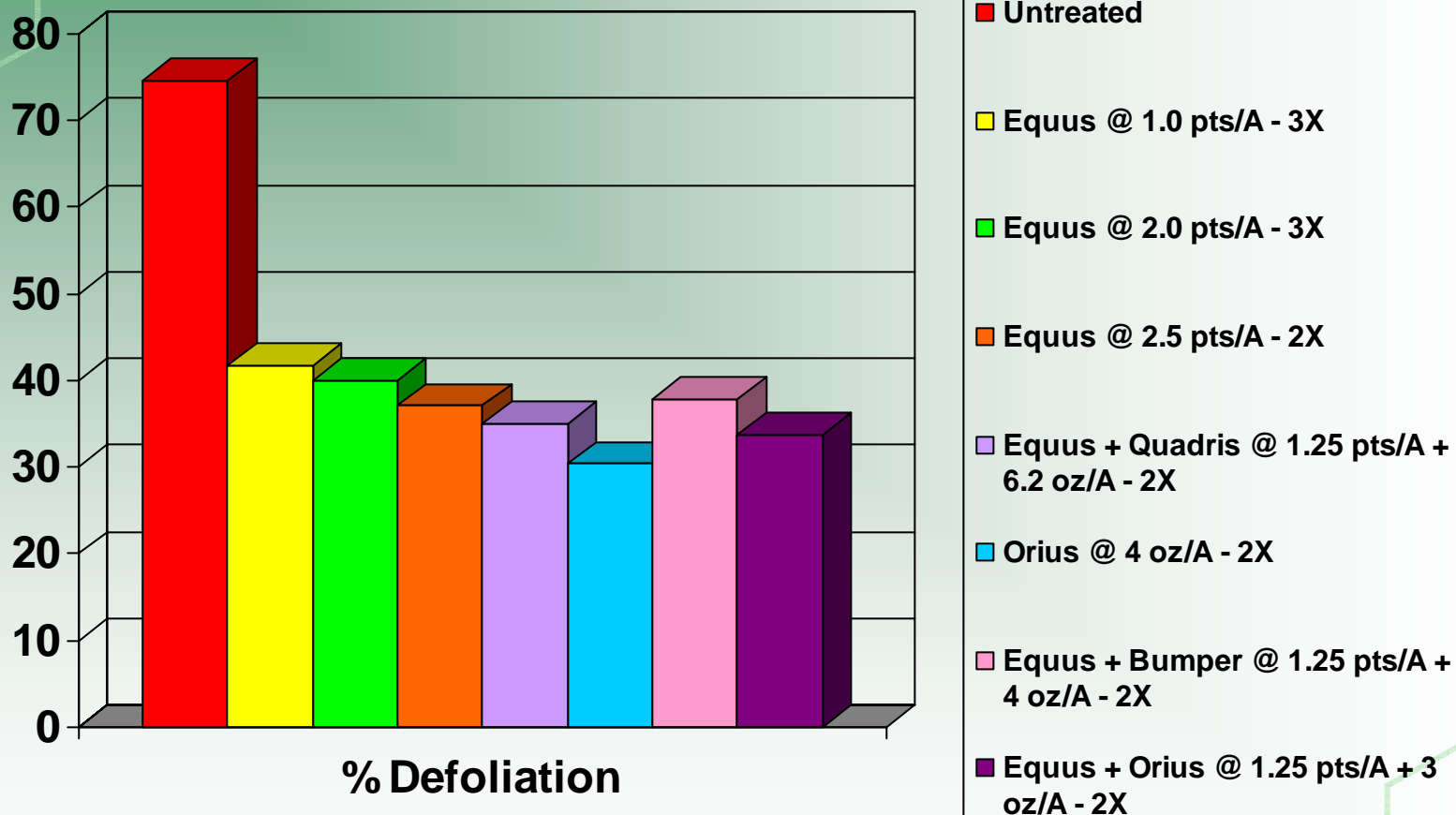
# MANA Fungicides vs Soybean Rust

Severity Evaluation



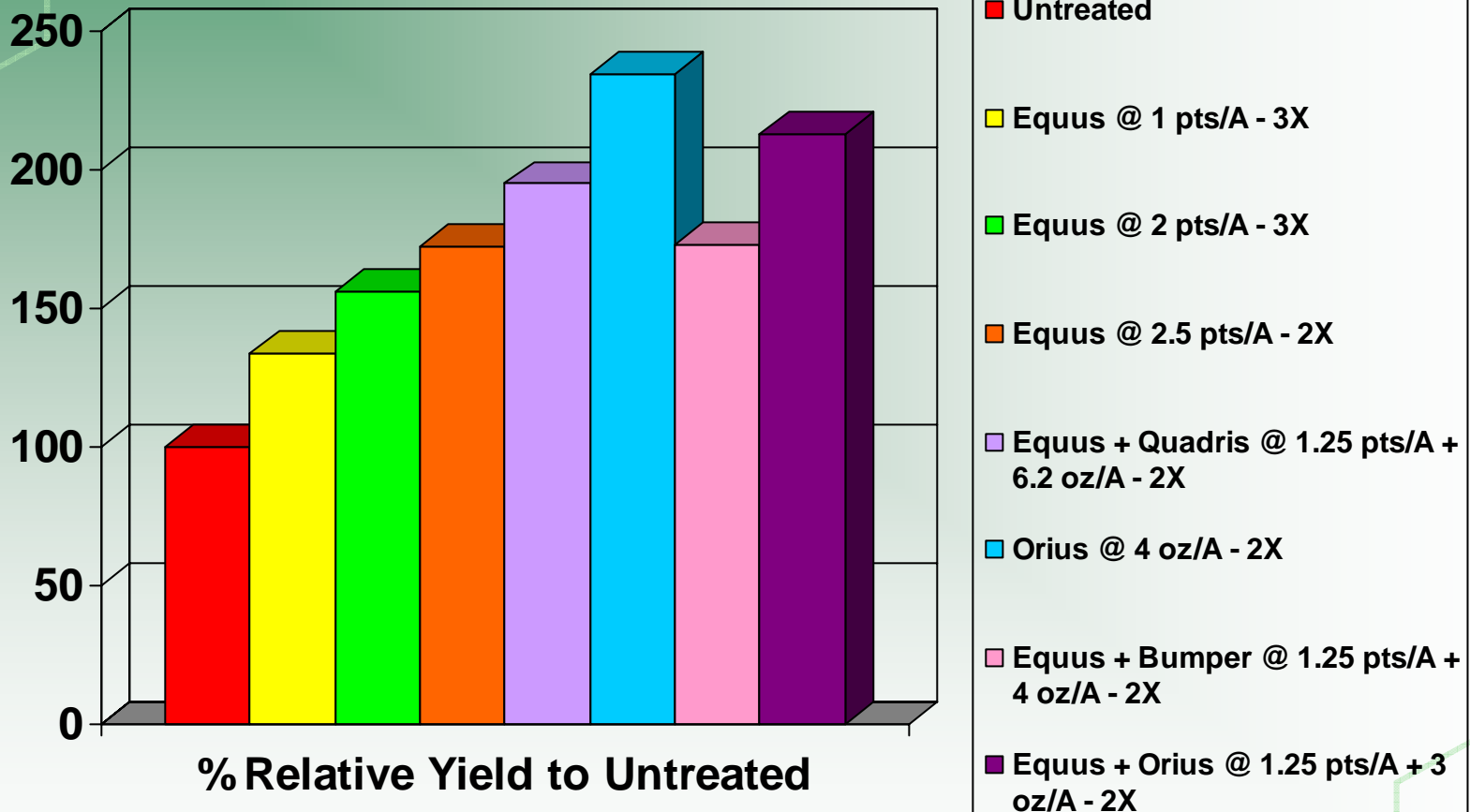
Mean Across 3 Studies

# MANA Fungicides vs Soybean Rust



Mean Across 3 Studies

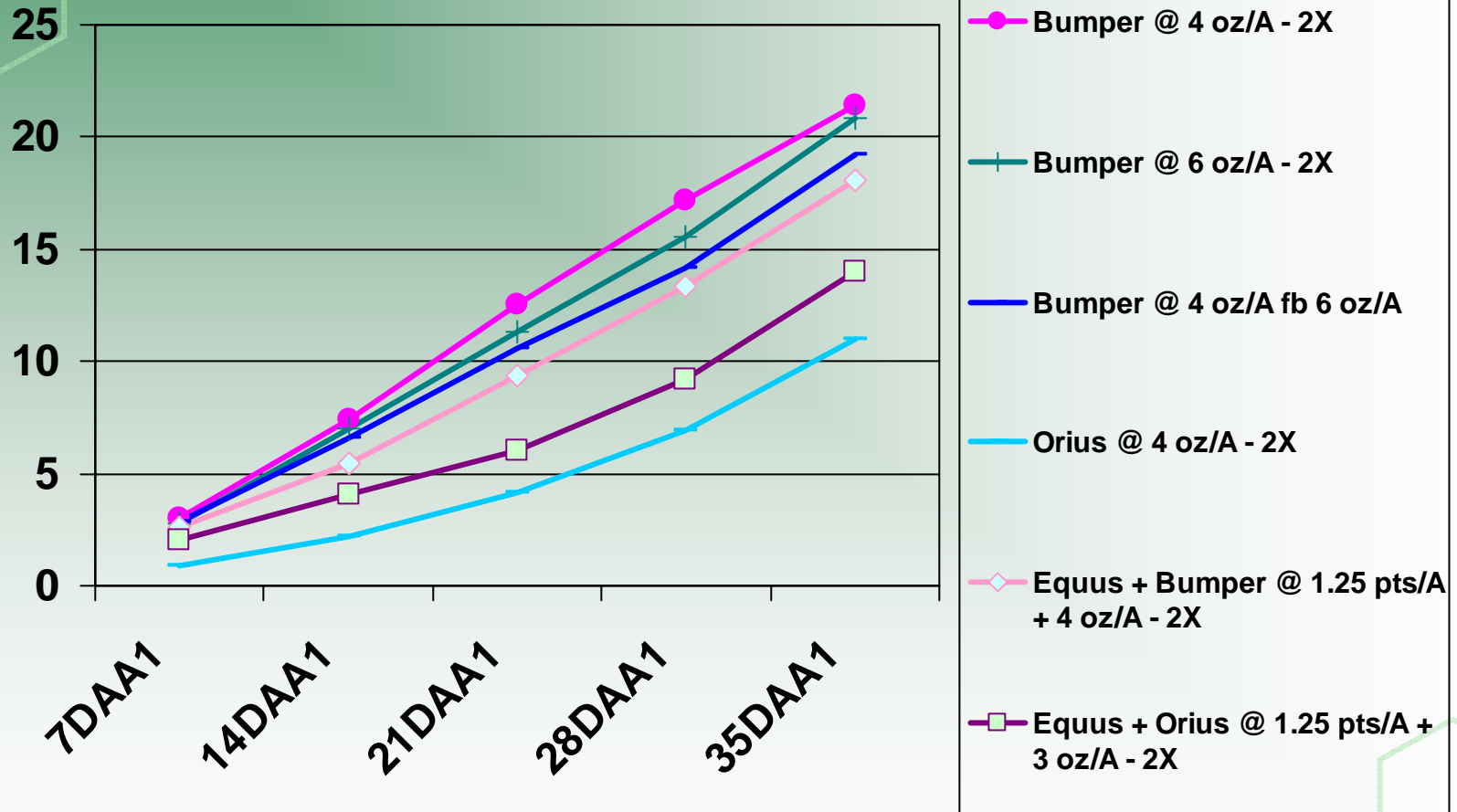
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Mean Across 3 Studies

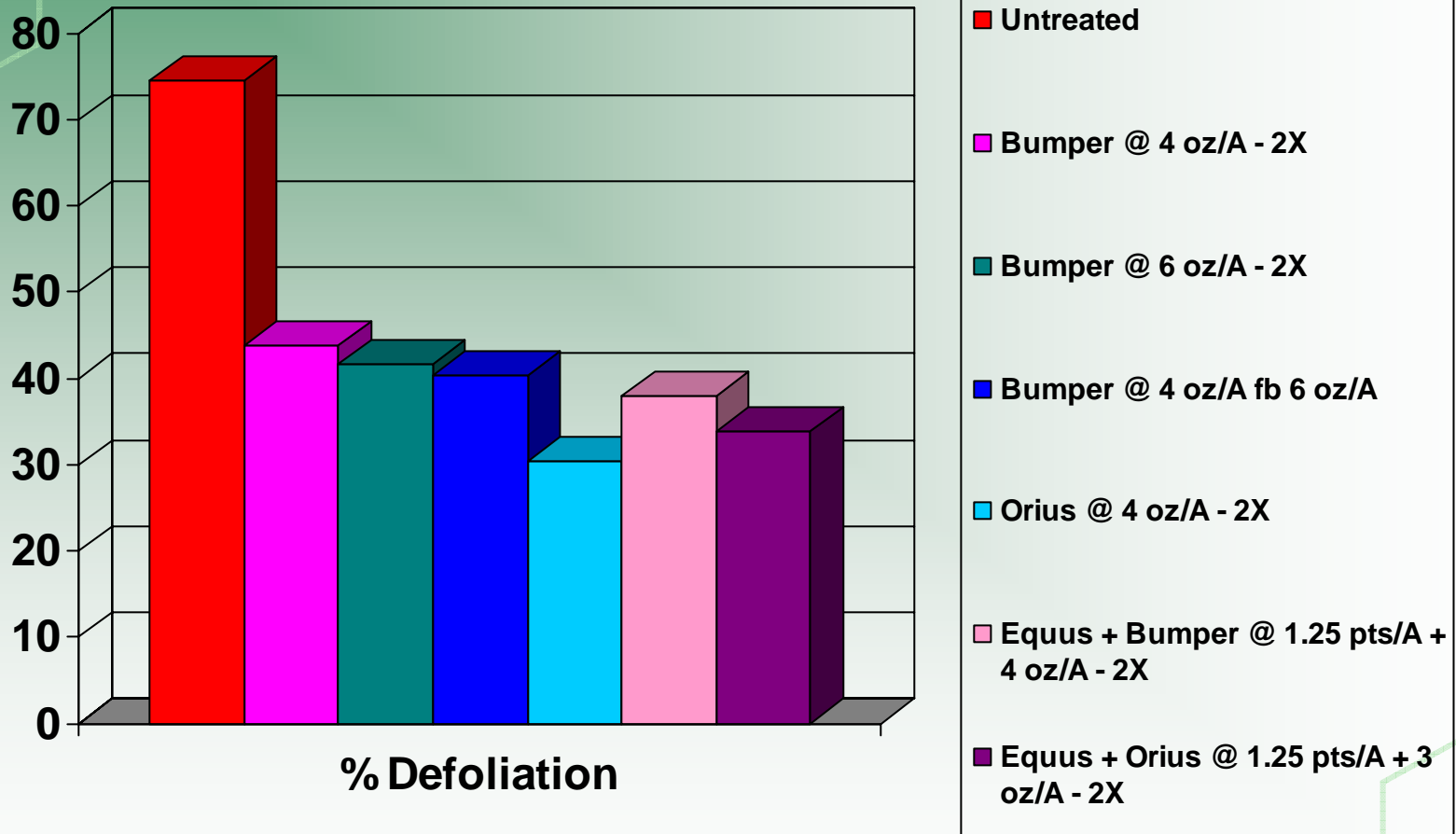
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Severity Evaluation



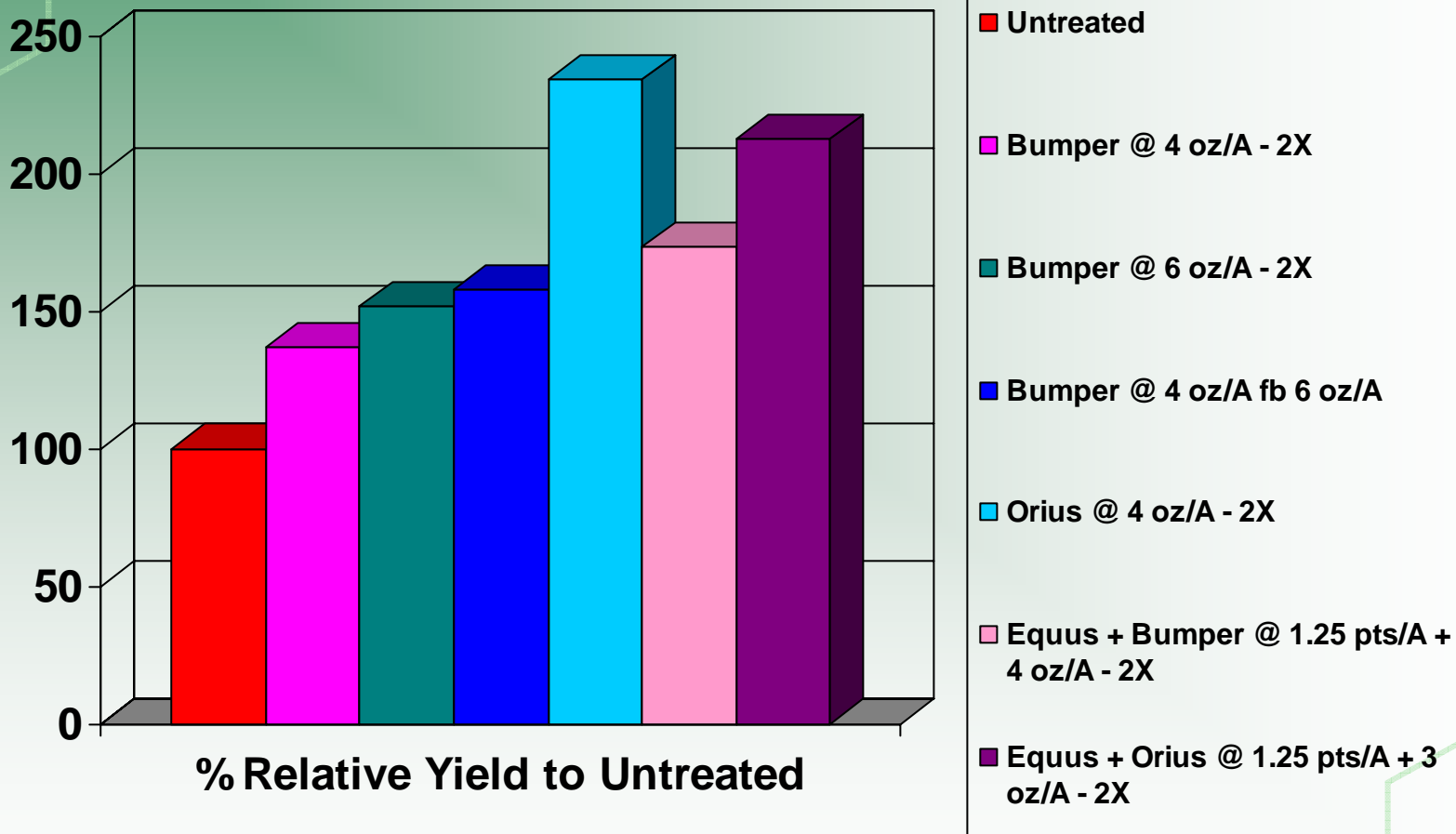
Mean Across 3 Studies

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Mean Across 3 Studies

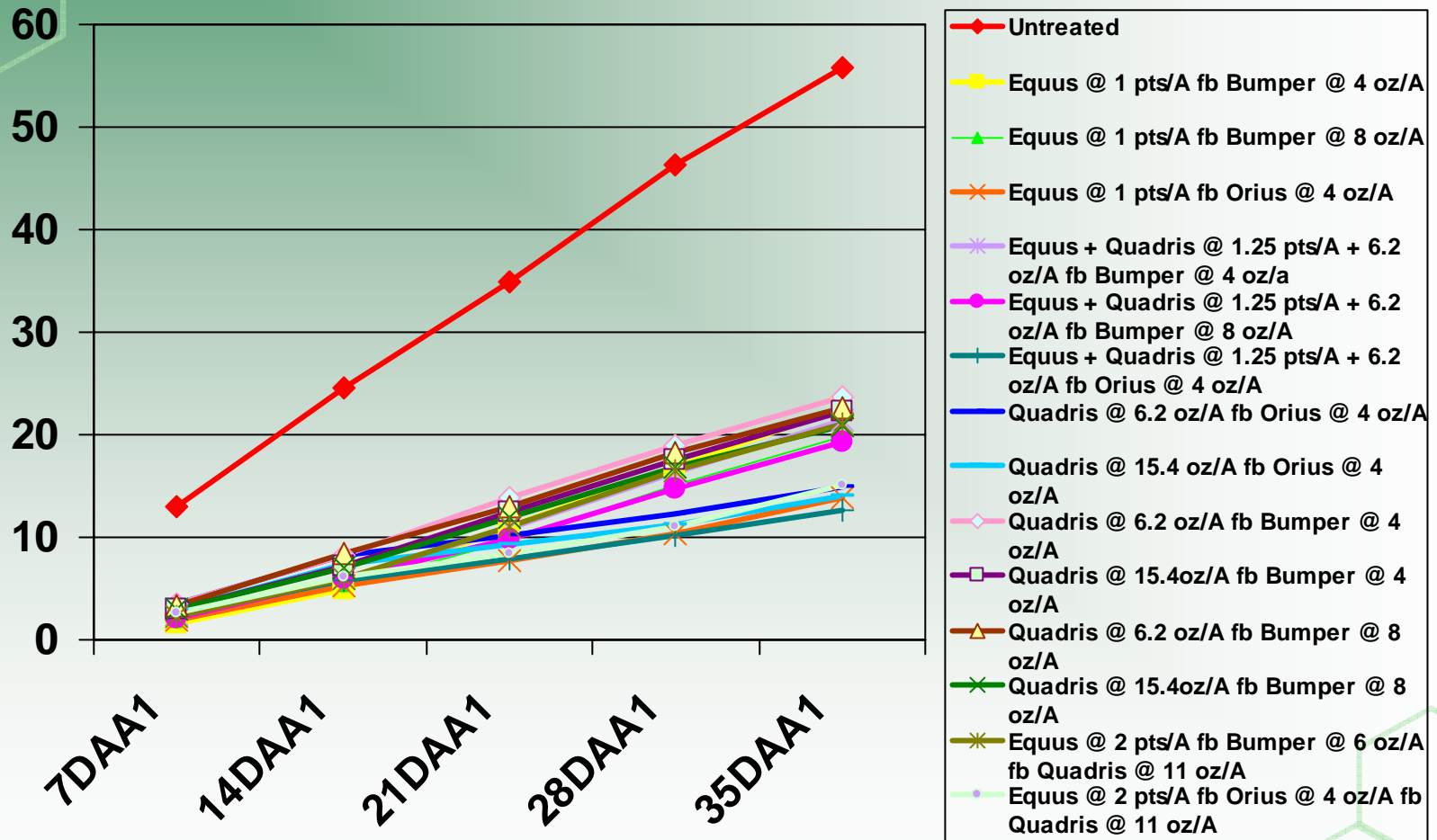
# MANA Fungicides vs Soybean Rust



Mean Across 3 Studies

# MANA Fungicides vs Soybean Rust

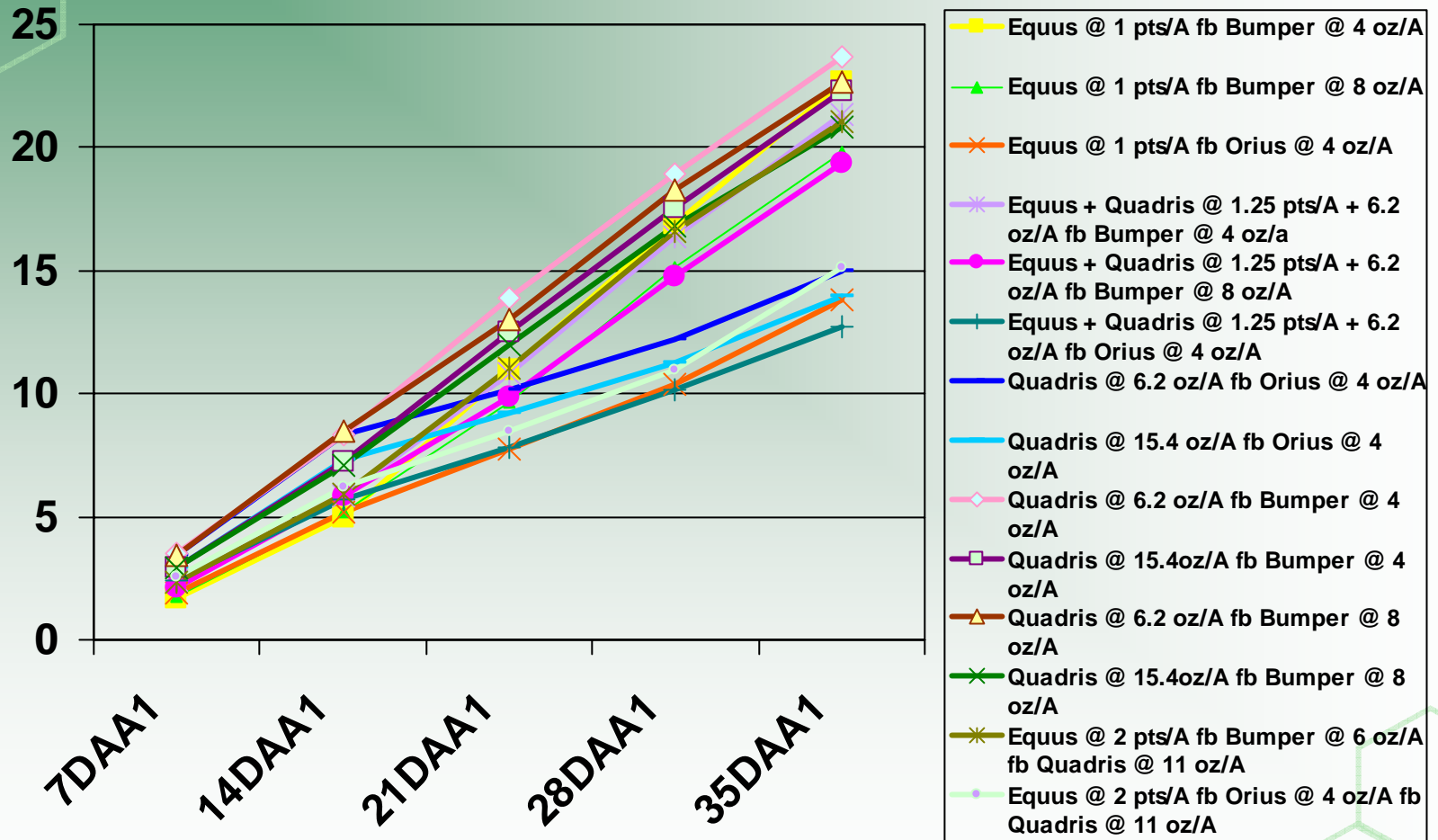
Severity Evaluation



Mean Across 3 Studies

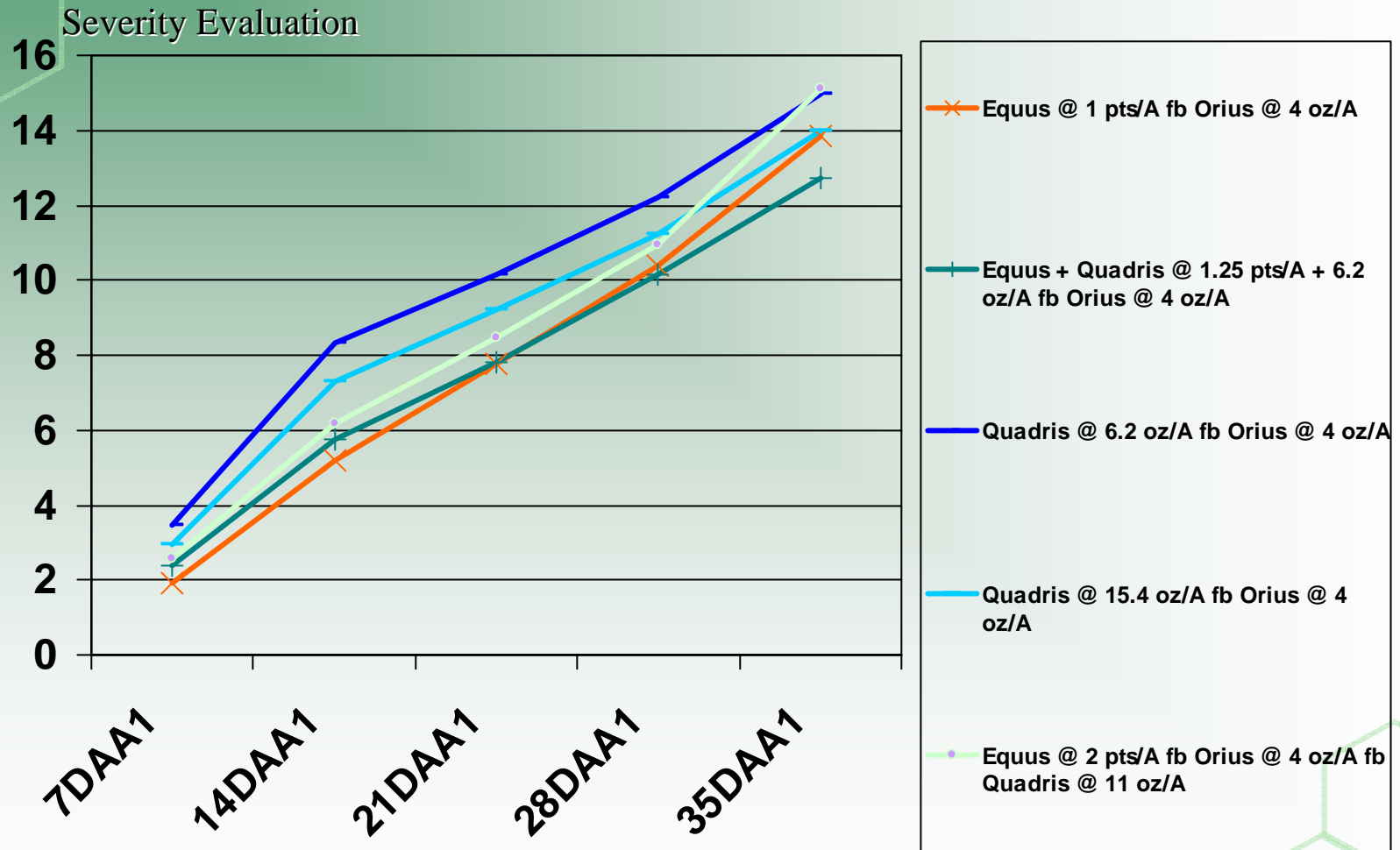
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## Severity Evaluation



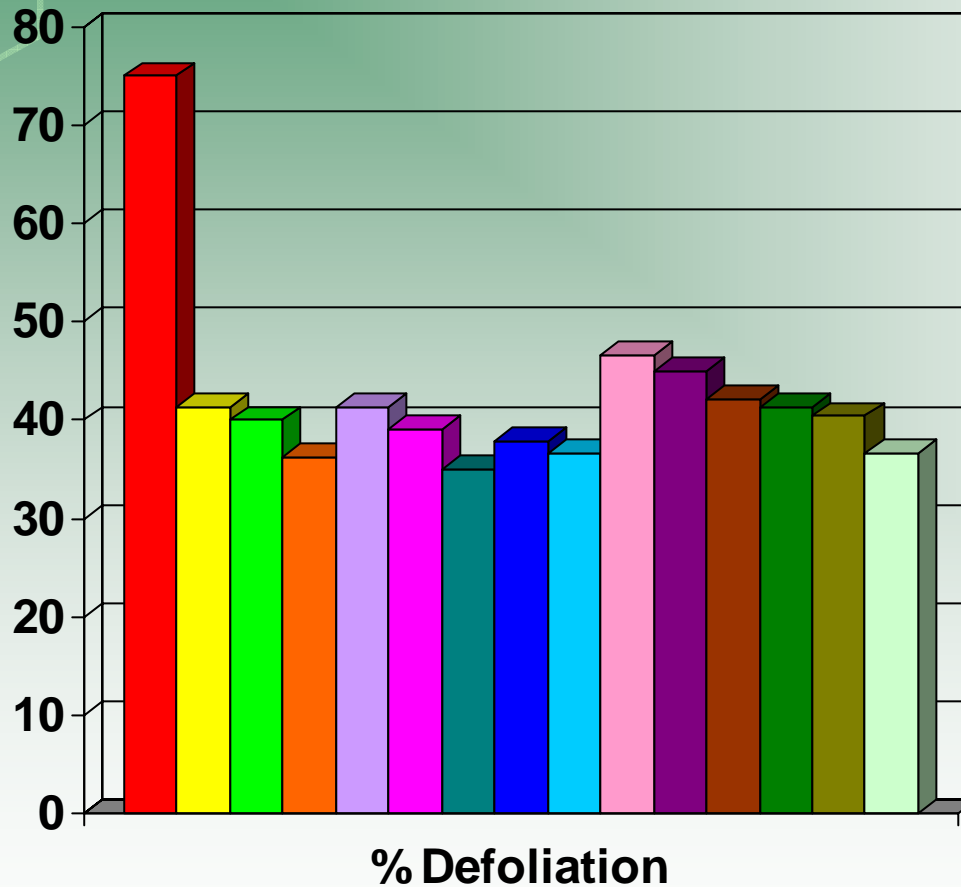
Mean Across 3 Studies

# MANA Fungicides vs Soybean Rust



Mean Across 3 Studies

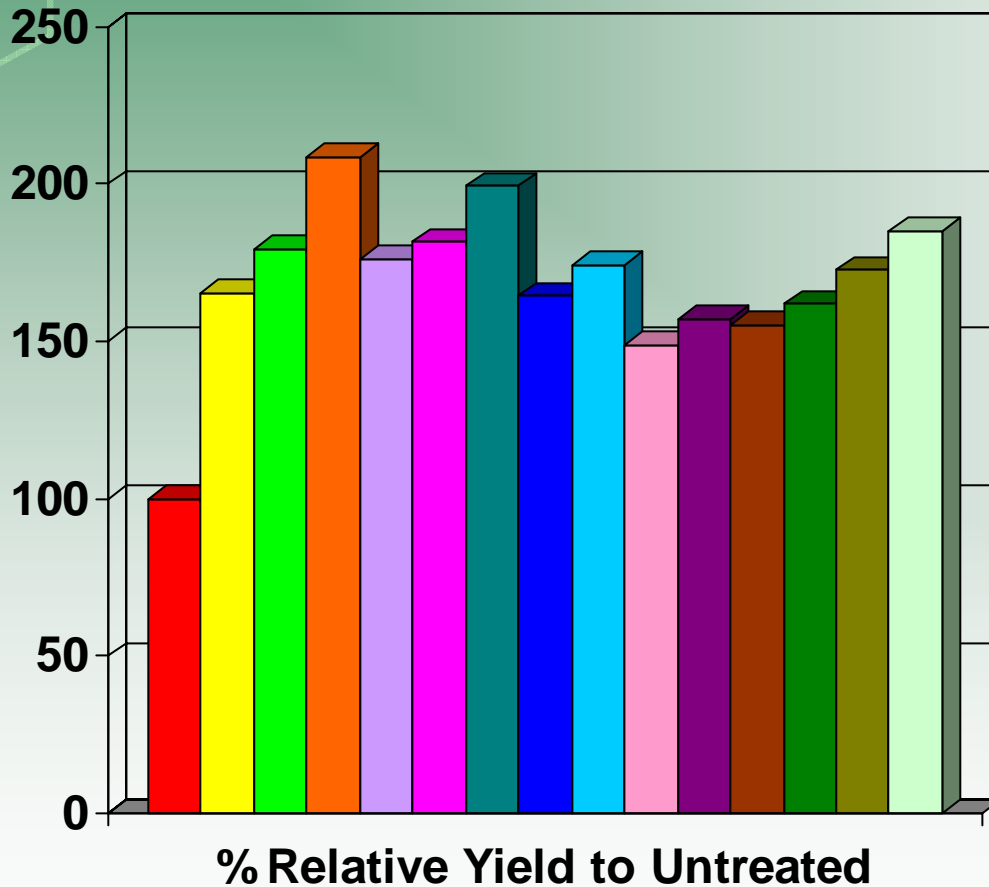
# MANA Fungicides vs Soybean Rust



- Untreated
- Equus @ 1 pts/A fb Bumper @ 4 oz/A
- Equus @ 1 pts/A fb Bumper @ 8 oz/A
- Equus @ 1 pts/A fb Orius @ 4 oz/A
- Equus + Quadris @ 1.25 pts/A + 6.2 oz/A fb Bumper @ 4 oz/a
- Equus + Quadris @ 1.25 pts/A + 6.2 oz/A fb Bumper @ 8 oz/A
- Equus + Quadris @ 1.25 pts/A + 6.2 oz/A fb Orius @ 4 oz/A
- Quadris @ 6.2 oz/A fb Orius @ 4 oz/A
- Quadris @ 15.4 oz/A fb Orius @ 4 oz/A
- Quadris @ 6.2 oz/A fb Bumper @ 4 oz/A
- Quadris @ 15.4oz/A fb Bumper @ 4 oz/A
- Quadris @ 6.2 oz/A fb Bumper @ 8 oz/A
- Quadris @ 15.4oz/A fb Bumper @ 8 oz/A
- Equus @ 2 pts/A fb Bumper @ 6 oz/A fb Quadris @ 11 oz/A
- Equus @ 2 pts/A fb Orius @ 4 oz/A fb Quadris @ 11 oz/A

Mean Across 3 Studies

# MANA Fungicides vs Soybean Rust



- Untreated
- Equus @ 1 pts/A fb Bumper @ 4 oz/A
- Equus @ 1 pts/A fb Bumper @ 8 oz/A
- Equus @ 1 pts/A fb Orius @ 4 oz/A
- Equus + Quadris @ 1.25 pts/A + 6.2 oz/A fb Bumper @ 4 oz/a
- Equus + Quadris @ 1.25 pts/A + 6.2 oz/A fb Bumper @ 8 oz/A
- Equus + Quadris @ 1.25 pts/A + 6.2 oz/A fb Orius @ 4 oz/A
- Quadris @ 6.2 oz/A fb Orius @ 4 oz/A
- Quadris @ 15.4 oz/A fb Orius @ 4 oz/A
- Quadris @ 6.2 oz/A fb Bumper @ 4 oz/A
- Quadris @ 15.4oz/A fb Bumper @ 4 oz/A
- Quadris @ 6.2 oz/A fb Bumper @ 8 oz/A
- Quadris @ 15.4oz/A fb Bumper @ 8 oz/A
- Equus @ 2 pts/A fb Bumper @ 6 oz/A fb Quadris @ 11 oz/A
- Equus @ 2 pts/A fb Orius @ 4 oz/A fb Quadris @ 11 oz/A

Mean Across 3 Studies

# Summary

- Bumper, Equus and Orius Offer Soybean Growers Effective Soybean Rust Control tools
- Bumper and Equus Fit Early in the Soybean Rust Cycle and in Areas Where Disease Pressure is Light
- Bumper and Equus can be Tankmixed With Other Fungicides for Resistance Management
- Orius can be Used Preventatively or Curatively in Areas Which Experience Light or Heavy Soybean Rust Pressure



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