

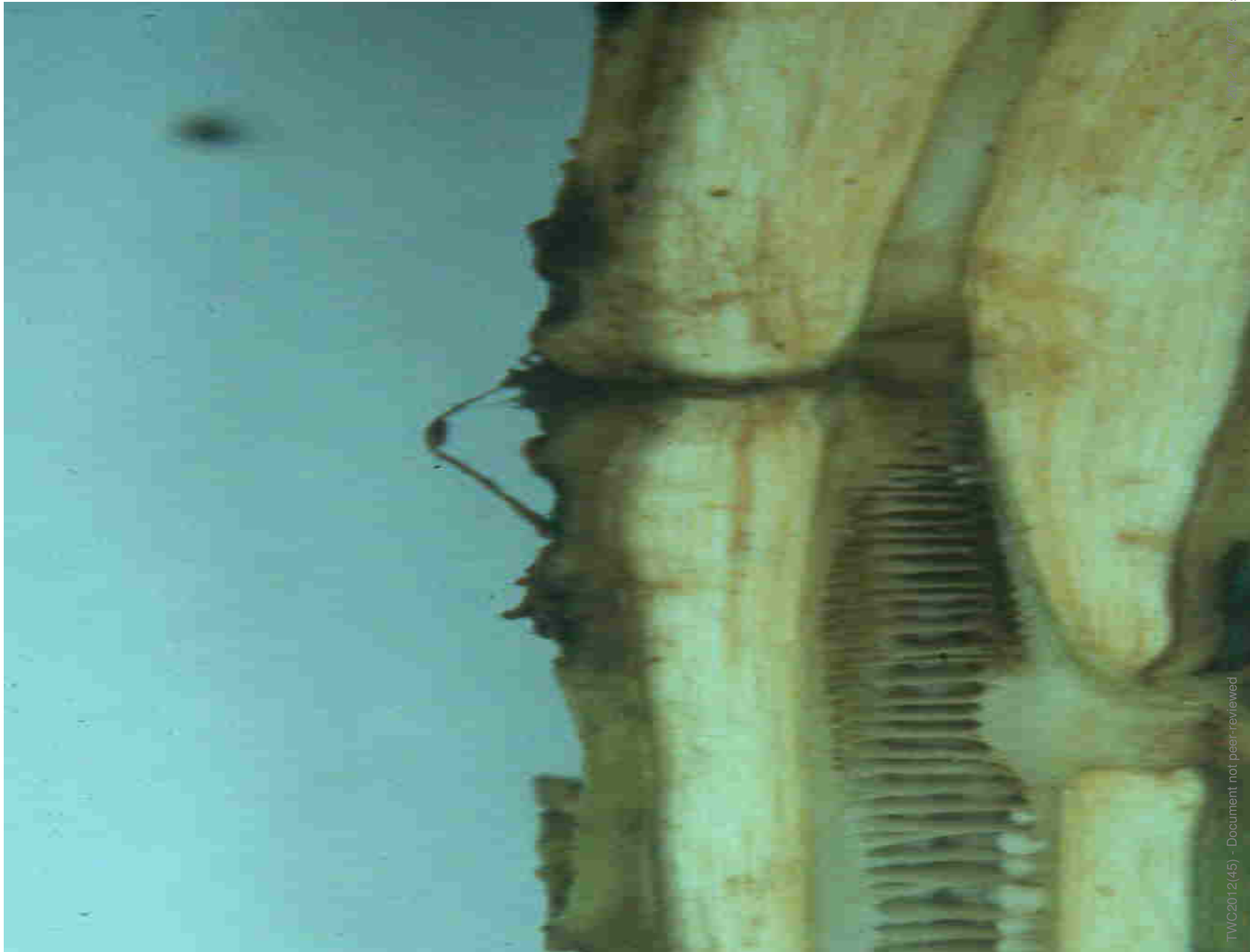
EVALUATION of NEW CHEMISTRY for TOBACCO BLACK SHANK MANAGEMENT



AS Csinos, LL Hickman, U Hargett The
University of Georgia

Plant Pathology







BLACK SHANK

GEORGIA RACE 1

1992 = 16%

2003 = 83%

2010 = 100%

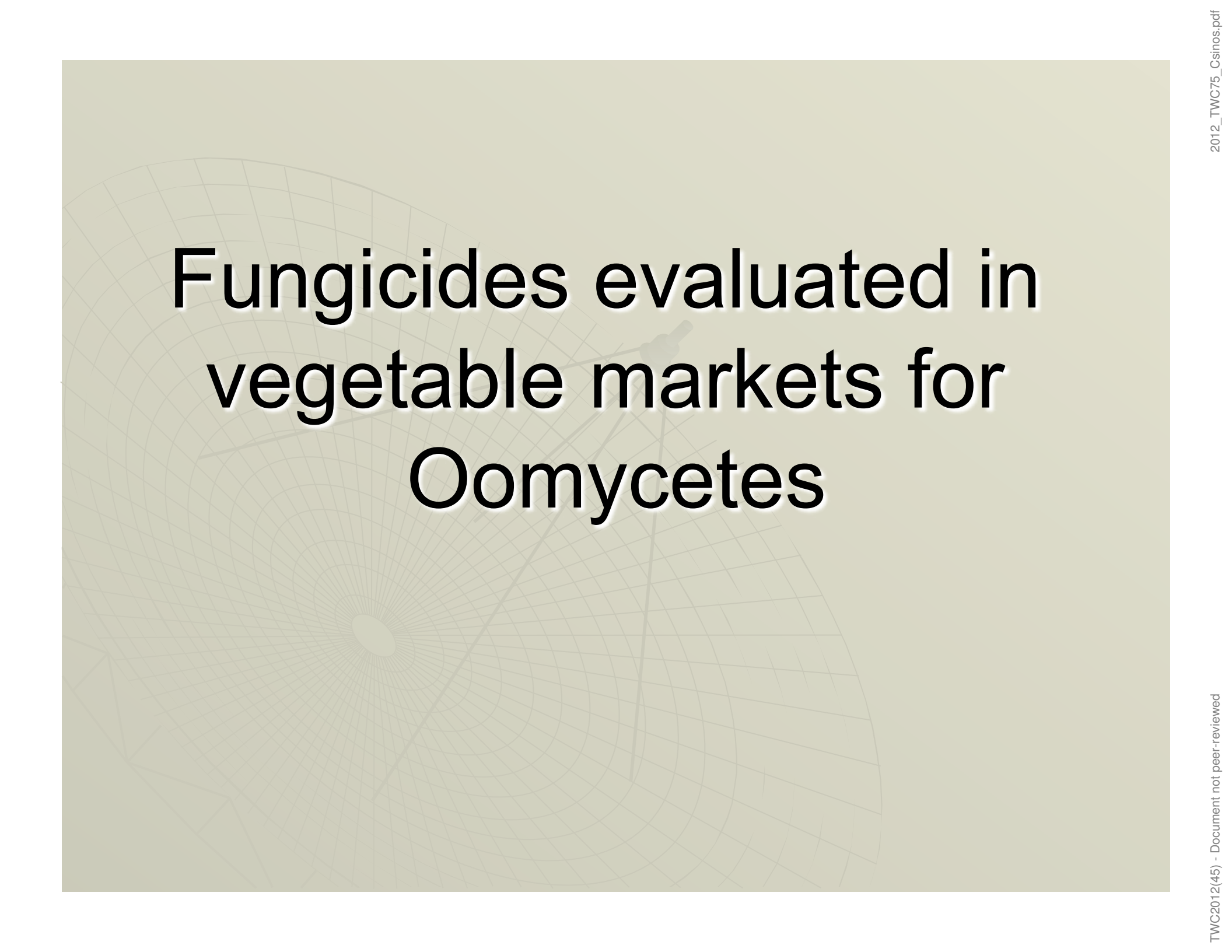




◆ Race 0 → Race 1
Under genetic pressure



**ONLY LOW LEVEL OF
RESISTANCE AVAILABLE TO
RACE 1**



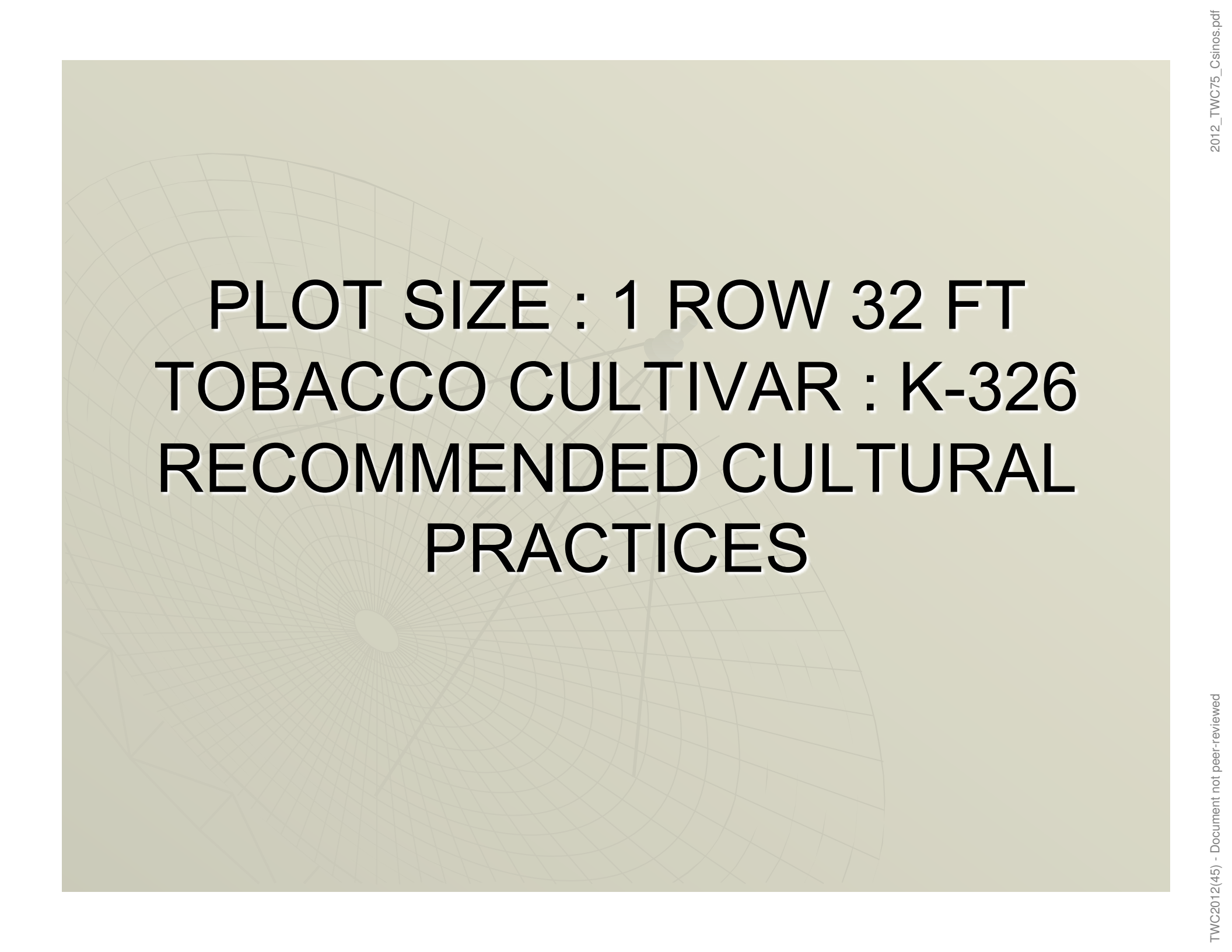
Fungicides evaluated in vegetable markets for Oomycetes

OBJECTIVES

EVALUATE NEW CHEMISTRY
FOR BLACK SHANK
MANAGEMENT

RANDOMIZED COMPLETE BLOCK DESIGN

5 replications

The background of the slide features a faint, light-colored image of a tobacco plant. A semi-transparent grid is overlaid on the plant, with a circular pattern centered on the main stem of the plant. The text is centered over this background.

PLOT SIZE : 1 ROW 32 FT
TOBACCO CULTIVAR : K-326
RECOMMENDED CULTURAL
PRACTICES

Treatment List

Treatment	Product Rate
1. Ranman (cyazofamid)	5.0 oz/A
2. Zampro (ametoctradin + dimethlymorph)	10.0 oz/ A 14.0 oz/A at Layby
3. Revus (mandipropamid)	10.0 oz/A
4. Presidio (fluopicolide)	4.0 oz/A
5. Ridomil Gold 4SL (mefenoxam)	1.0 pt/A
6. BS-EXP	19.2 oz/A
7. Reason (fenamidone)	15.0 oz/A
8. Non-Treated Control	N/A

PLANT VIGOR AND PLANT HEIGHT

Treatment	Product Rate	Vigor	Height Measurement
1. Ranman (cyazofmid)	5.0 oz/A	8.0 a	59.8 a
2. Zampro (ametoctradin + dimethylmorph)	10.0 oz/A 14.0 oz/A (At Layby)	8.0 a	60.4 a
3. Revus (mandipropamid)	10.0 oz/A	7.8 ab	56.6 a
4. Presidio (fluopicolide)	4.0 oz/A	8.6 a	59.6 a
5. Ridomil Gold 4 SL (mefenoxam)	1.0 pt/A	7.9 ab	63.5 a
6. BS-EXP	19.2 oz/A	8.6 a	63.7 a
7. Reason (fenamidone)	15.0 oz/A	8.0 a	63.2 a
8. Non-treated Control	N/A	7.0 b	56.8 a







PERCENT TOMATO SPOTTED WILT

Treatment	Product Rate	% Symptomatic TSWV
1. Ranman (cyazofmid)	5.0 oz/A	2.4 ab
2. Zampro (ametoctradin + dimethylmorph)	10.0 oz/A 14.0 oz/A (At Layby)	5.7 ab
3. Revus (mandipropamid)	10.0 oz/A	6.5 ab
4. Presidio (fluopicolide)	4.0 oz/A	0.8 b
5. Ridomil Gold 4 SL (mefenoxam)	1.0 pt/A	3.3 ab
6. BS-EXP	19.2 oz/A	7.2 a
7. Reason (fenamidone)	15.0 oz/A	0.9 b
8. Non-treated Control	N/A	3.0 ab

Percent Black Shank

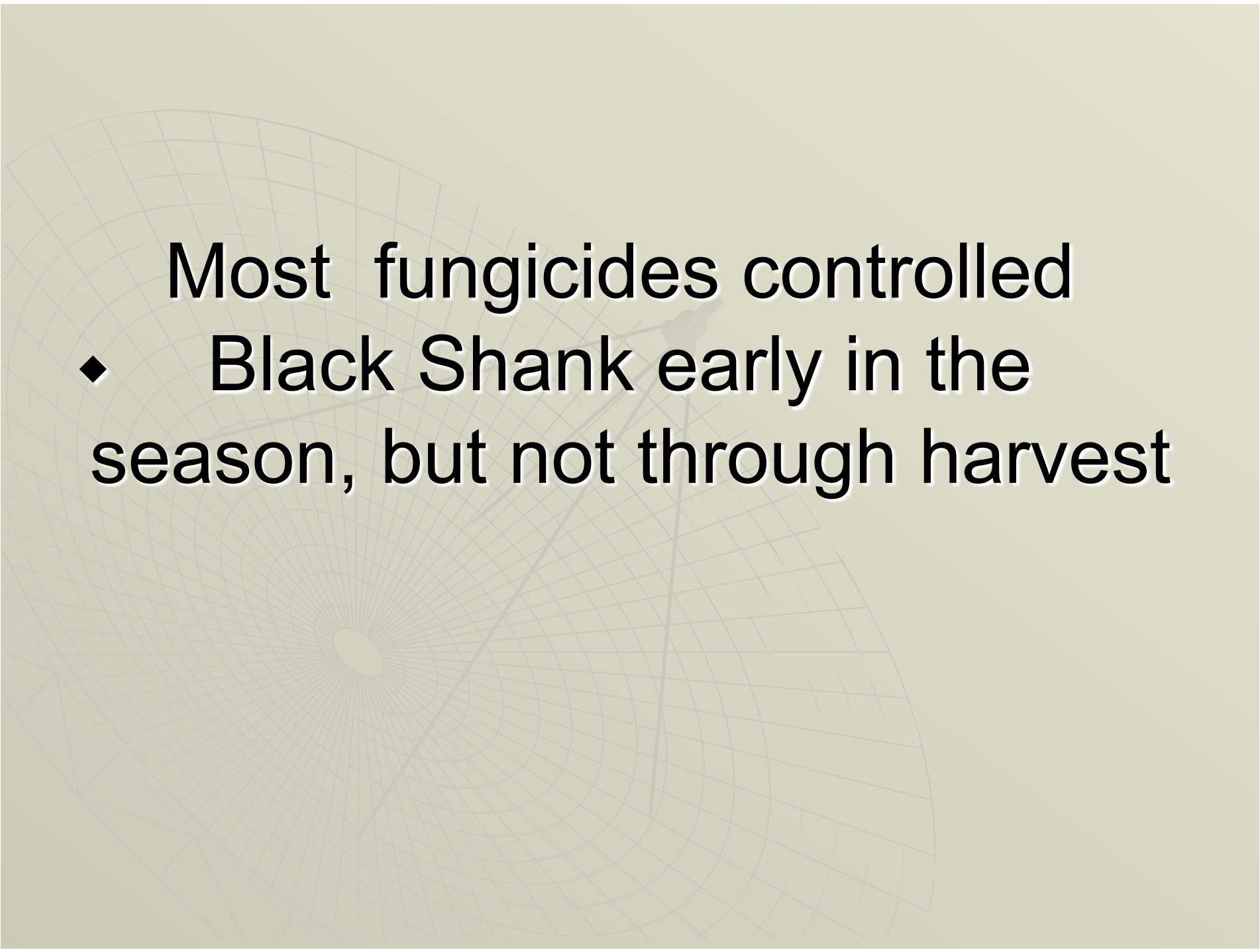
Treatment	Product Rate	Application Schedule	% Death by Black Shank
1. Ranman (cyazofamid)	5.0 oz/A	AP, 1 st Cult., Layby	20.5 b
2. Zampro (ametoctradin + dimethylmorph)	10.0 oz/A 14.0 oz/A (at layby)	AP, 1 st Cult., Layby	55.1 a
3. Revus (mandipropamid)	10.0 oz/A	AP, 1 st Cult., Layby	11.6 b
4. Presidio (fluopicolide)	4.0 oz/A	AP, 1 st Cult., Layby	5.9 b
5. Ridomil Gold 4 SL (mefenoxam)	1.0 pt/A	AP, 1 st Cult., Layby	51.7 a
6. BS-EXP	19.2 oz/A	AP, 1 st Cult., Layby	8.1 b
7. Reason (fenamidone)	15.0 oz/A	AP, 1 st Cult., Layby	18.9 b
8. Non-treated	N/A	AP, 1 st Cult., Layby	69.3 a

Treatment	Product Rate	Application Schedule	Dry Weight Yield
1. Ranman (cyazofmid)	5.0 oz/A	Plant, 1 st Cultivation, Layby	630.2 bc
2. Zampro (ametoctradin + dimethylmorph)	10.0 oz/A 14.0 oz/A (At Layby)	Plant, 1 st Cultivation, Layby	825.4 bc
3. Revus (mandipropamid)	10.0 oz/A	Plant, 1 st Cultivation, Layby	1244.6 b
4. Presidio (fluopicolide)	4.0 oz/A	Plant, 1 st Cultivation, Layby	2198.6 a
5. Ridomil Gold 4 SL (mefenoxam)	1.0 pt/A	Plant, 1 st Cultivation, Layby	644.0 bc
6. BS-EXP	19.2 oz/A	Plant, 1 st Cultivation, Layby	1976.6 a
7. Reason (fenamidone)	15.0 oz/A	Plant, 1 st Cultivation, Layby	803.1 bc
8. Non-treated Control	N/A	N/A	307.3 c

conclusion

Vigor and early season
plant height suggest no
phyto

Mefenoxam, the
standard,
performed poorly

- 
- ◆ Most fungicides controlled Black Shank early in the season, but not through harvest

**Fluopicolide and BS-EX
both performed well in
this trial**



A close-up photograph of a shark's head, showing its eye, gills, and sharp teeth. The shark's skin is dark and textured. The eye is large and dark with a prominent iris. The gills are visible on the side of the head. The teeth are sharp and pointed.

**Thank You
Philip Morris International
Ga Tobacco Commission**

A close-up photograph of a snake's face, showing its eye and part of its mouth. The snake has a patterned skin with shades of brown, tan, and black. Overlaid on the image is yellow text.

Thank You
Philip Morris International
Ga Tobacco Commission

THANK YOU

PHILIP MORRIS International
GA Tobacco Commision





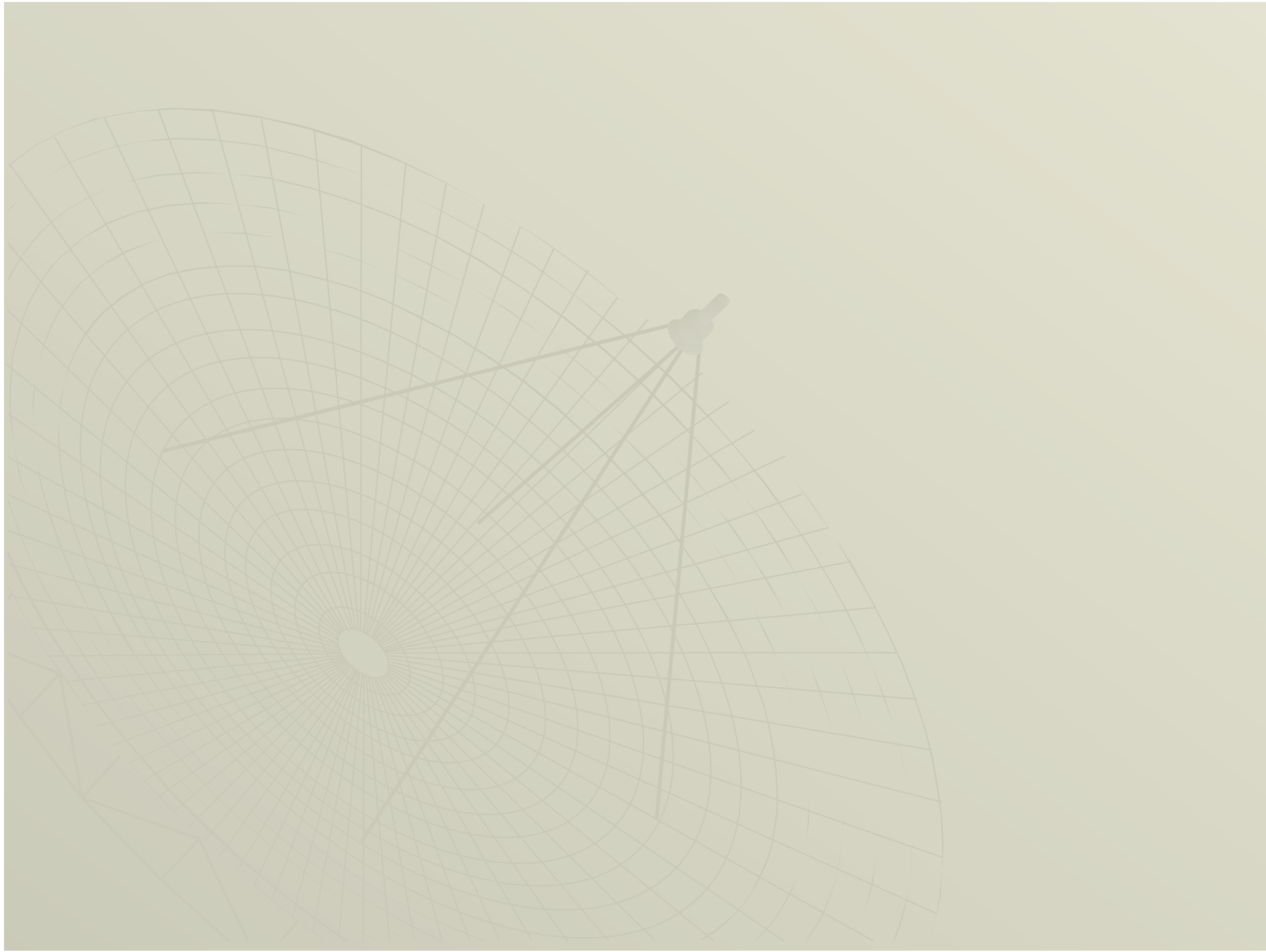
OBJECTIVES

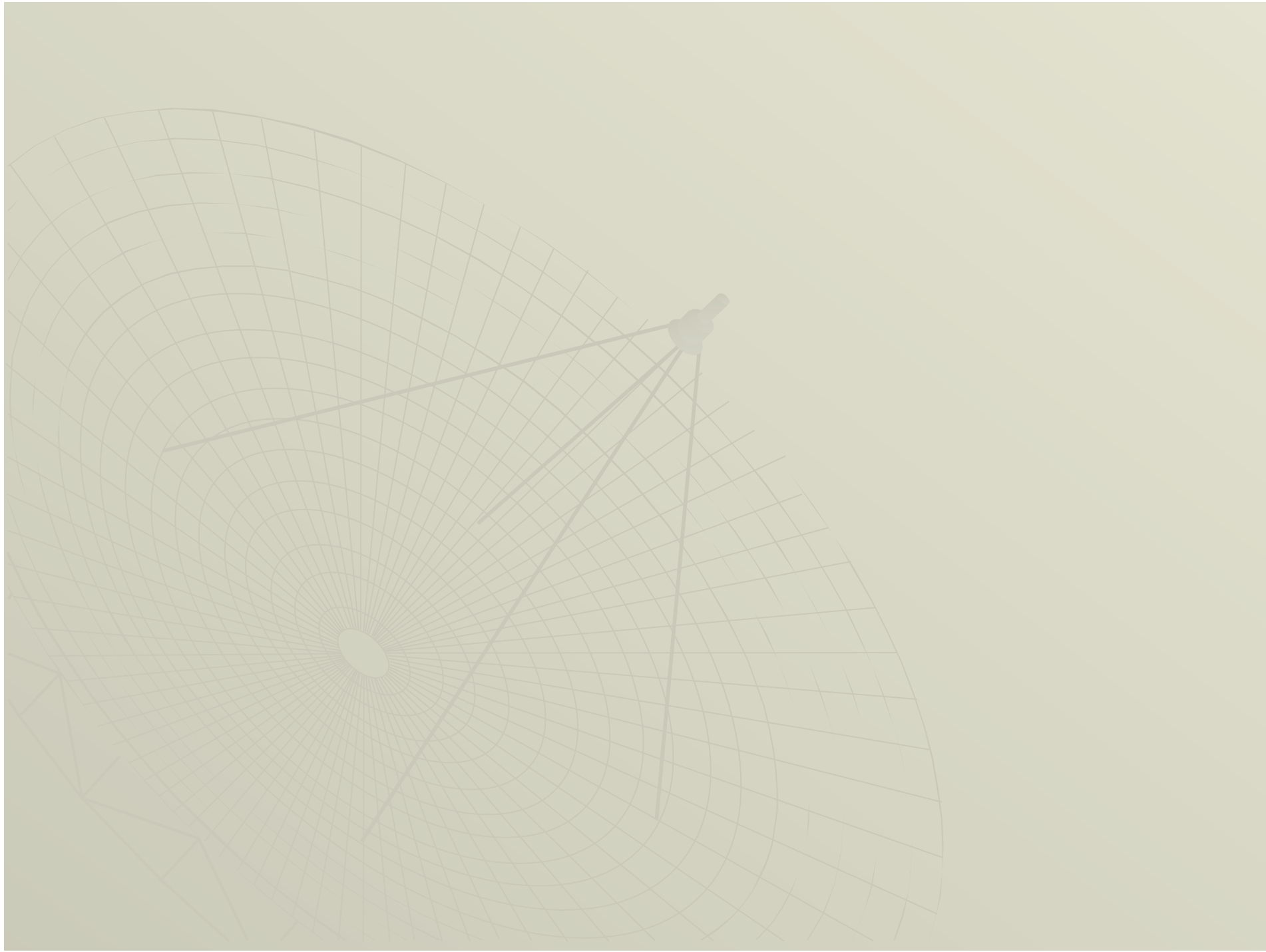
EVALUATE RIDOMIL GOLD
FOR RACE 0&1 BLACK SHANK
MANAGEMENT

RIDOMIL GOLD

1 PT AT PLANT

1 PT AT LAYBY





conclusions

2 candidates performed
well



- ◆ No commercial resistance available to race 1

BLACK SHANK NURSERY

42 YEARS CONTINUOUS TOBACCO

RACE 0 AND RACE 1 PRESENT

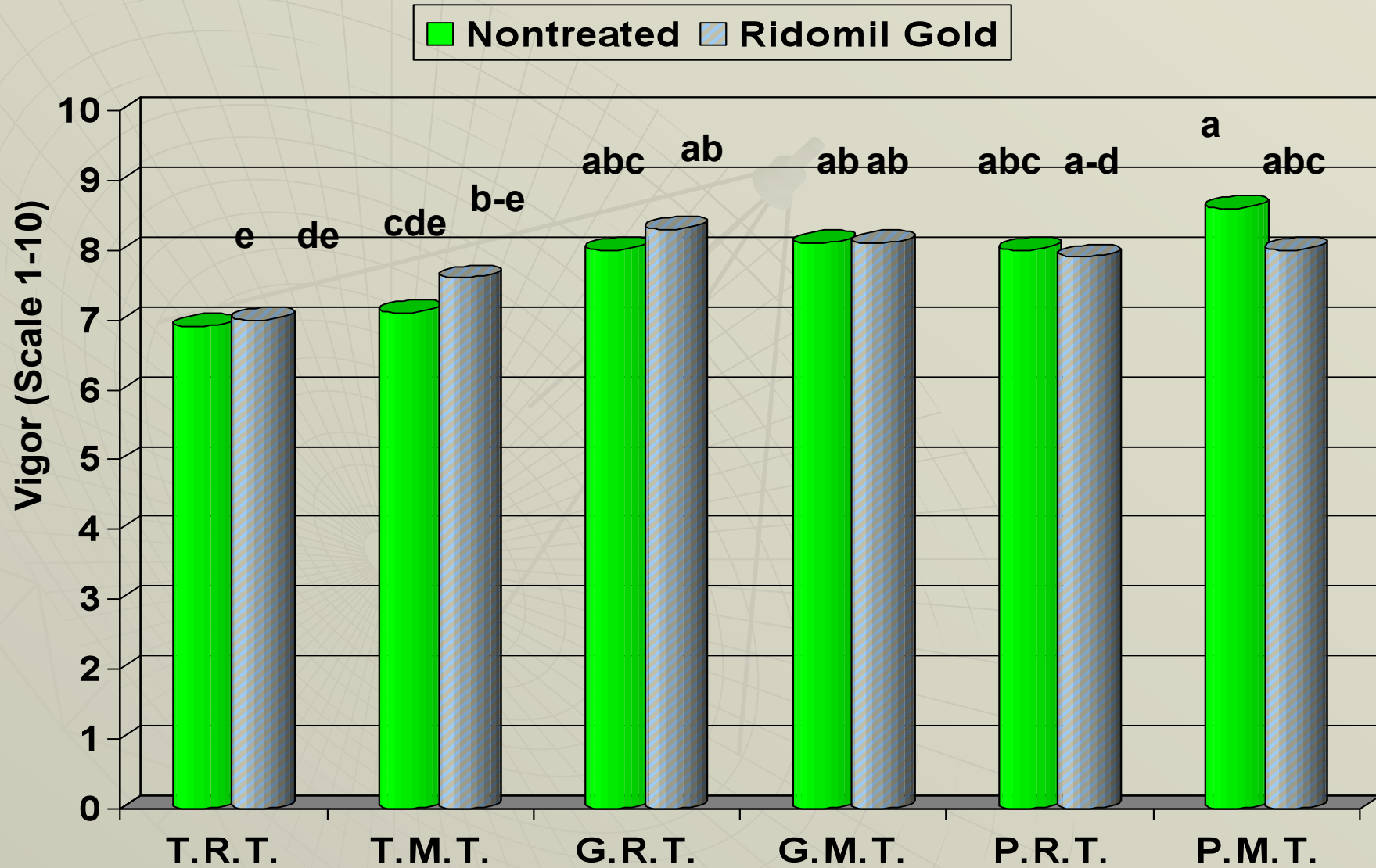


Rotation Scenarios

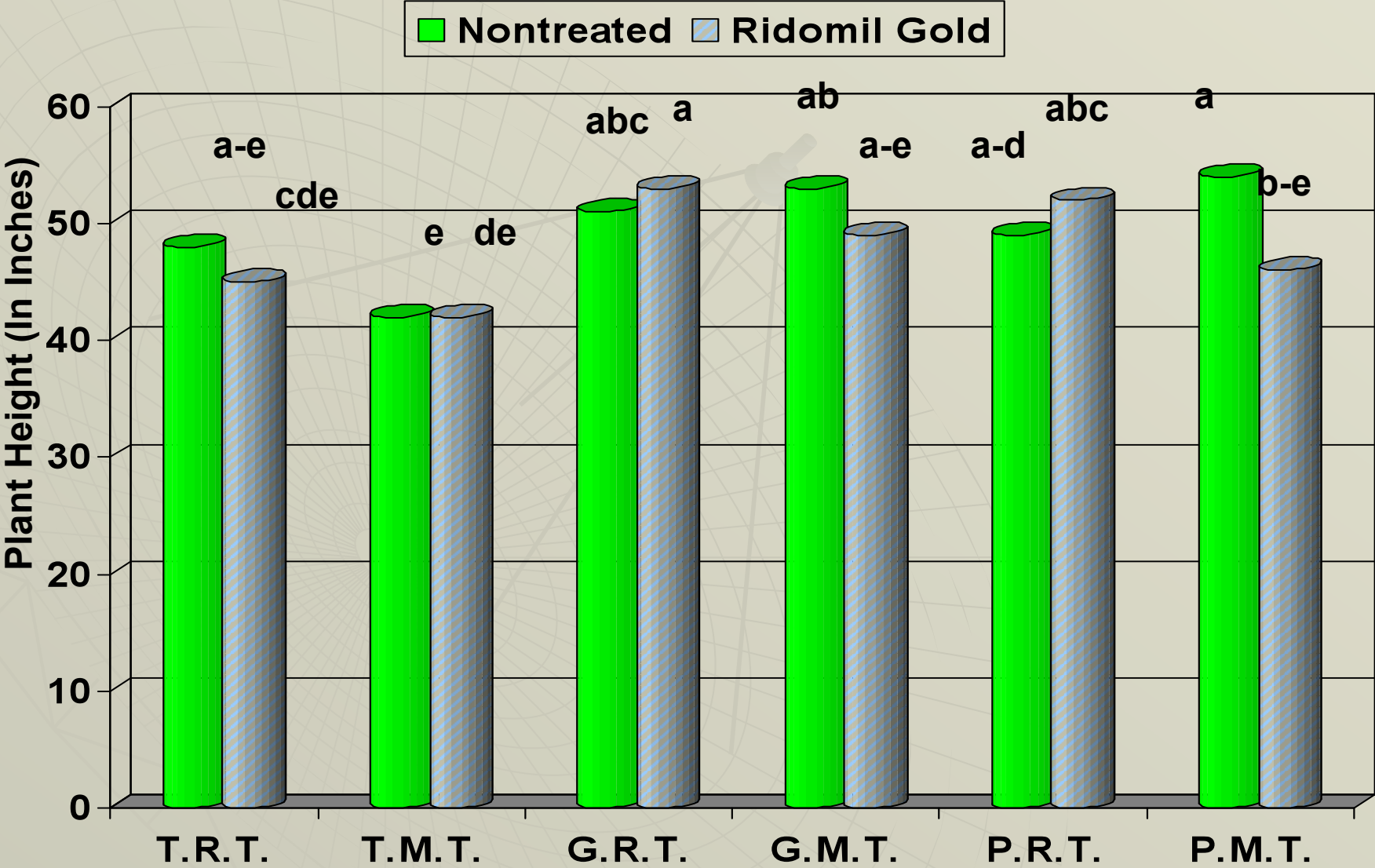
Treat	2004 Spring	2004 Fall	2005 Spring
1	Tobacco	Rye (cover)	Tobacco
2	Tobacco	Mustard (cover)	Tobacco
3	Grain (Rye)	Rye (cover)	Tobacco
4	Grain (Rye)	Mustard (cover)	Tobacco
5	Peanut	Rye (cover)	Tobacco
6	Peanut	Mustard (cover)	Tobacco

**DATA PRESENTED IS
FOR 2005 CROP YEAR**

Vigor Ratings

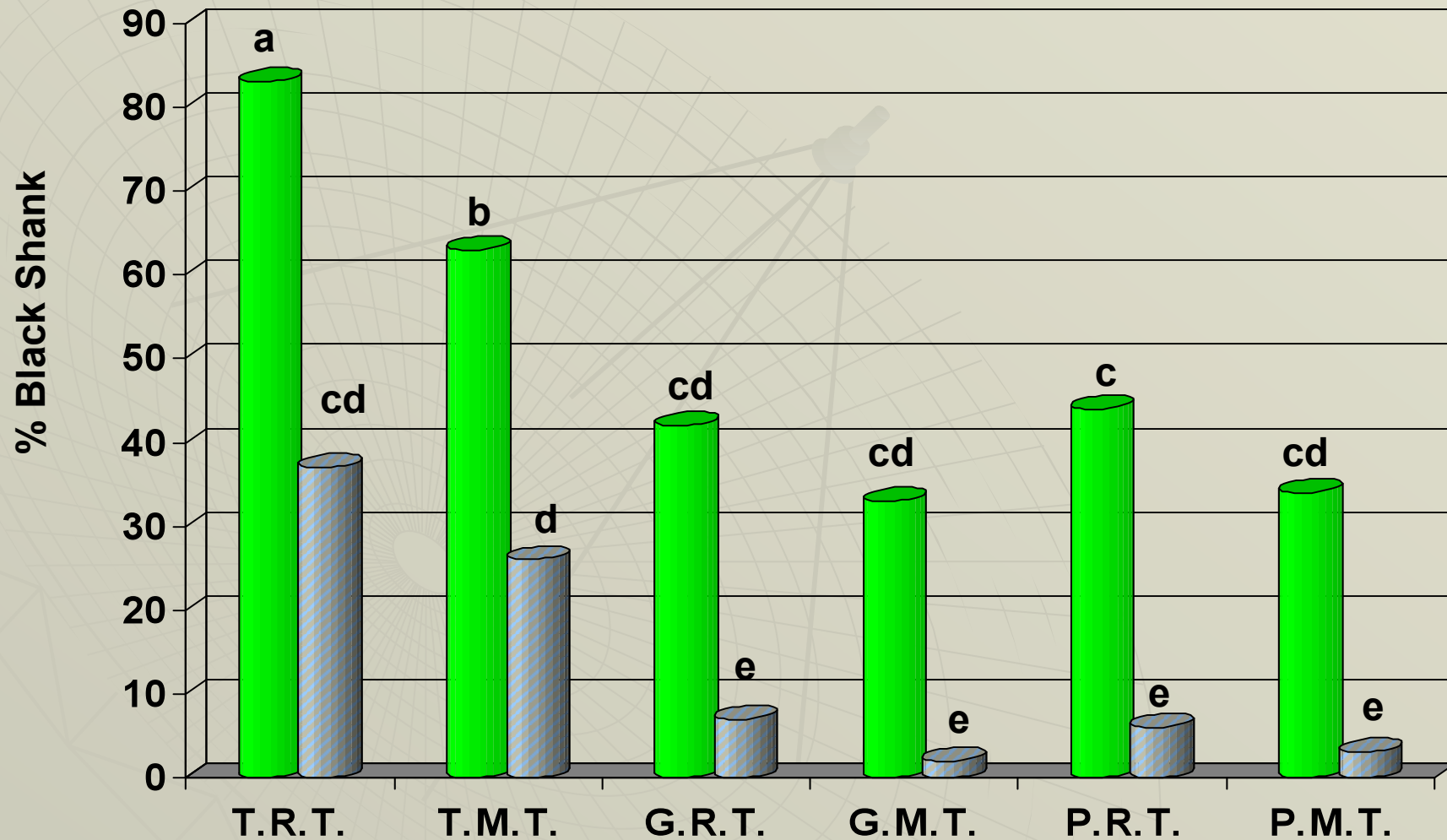


Plant Heights



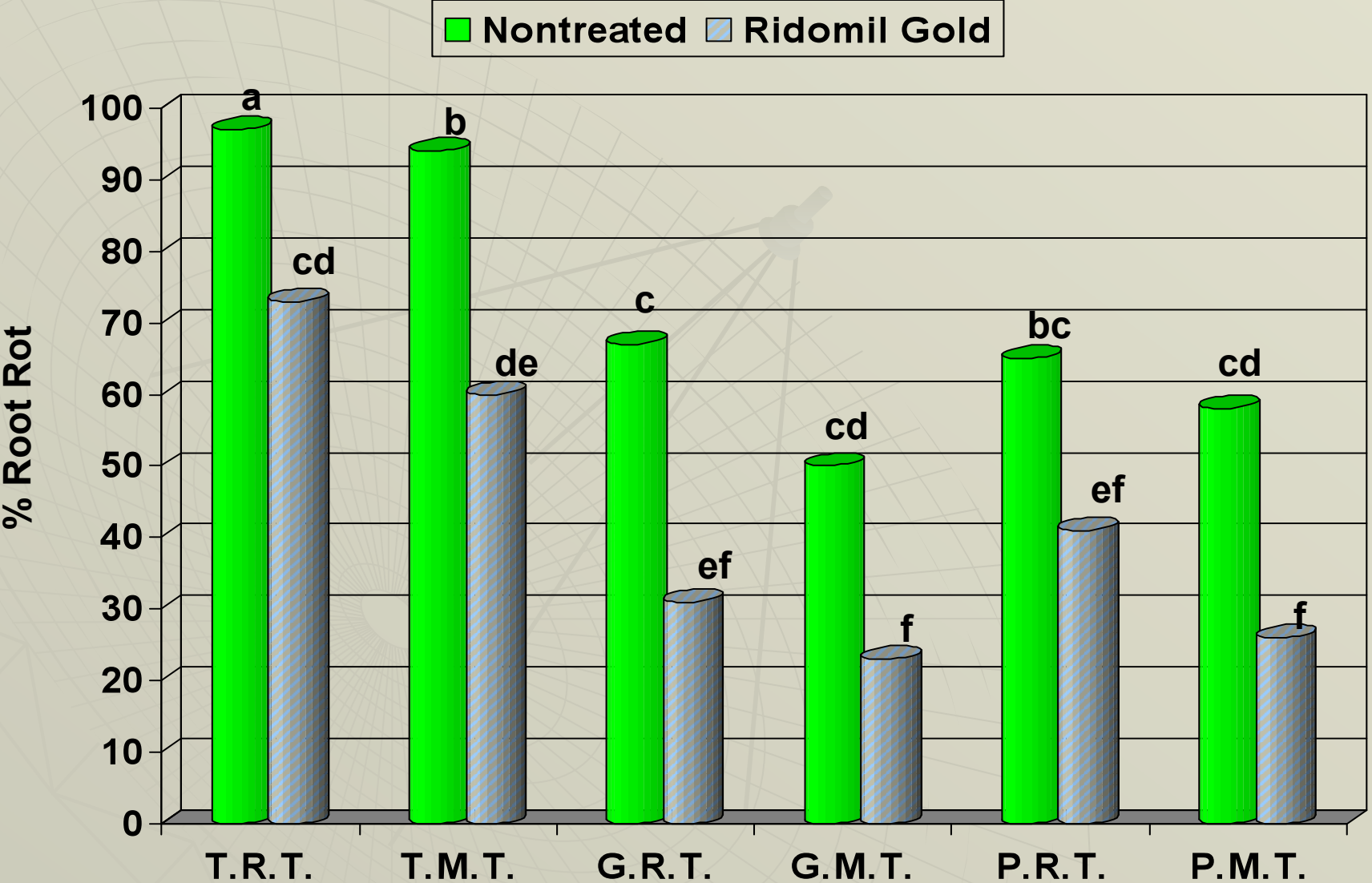
% Black Shank

■ Nontreated ▨ Ridomil Gold





% Root Rot

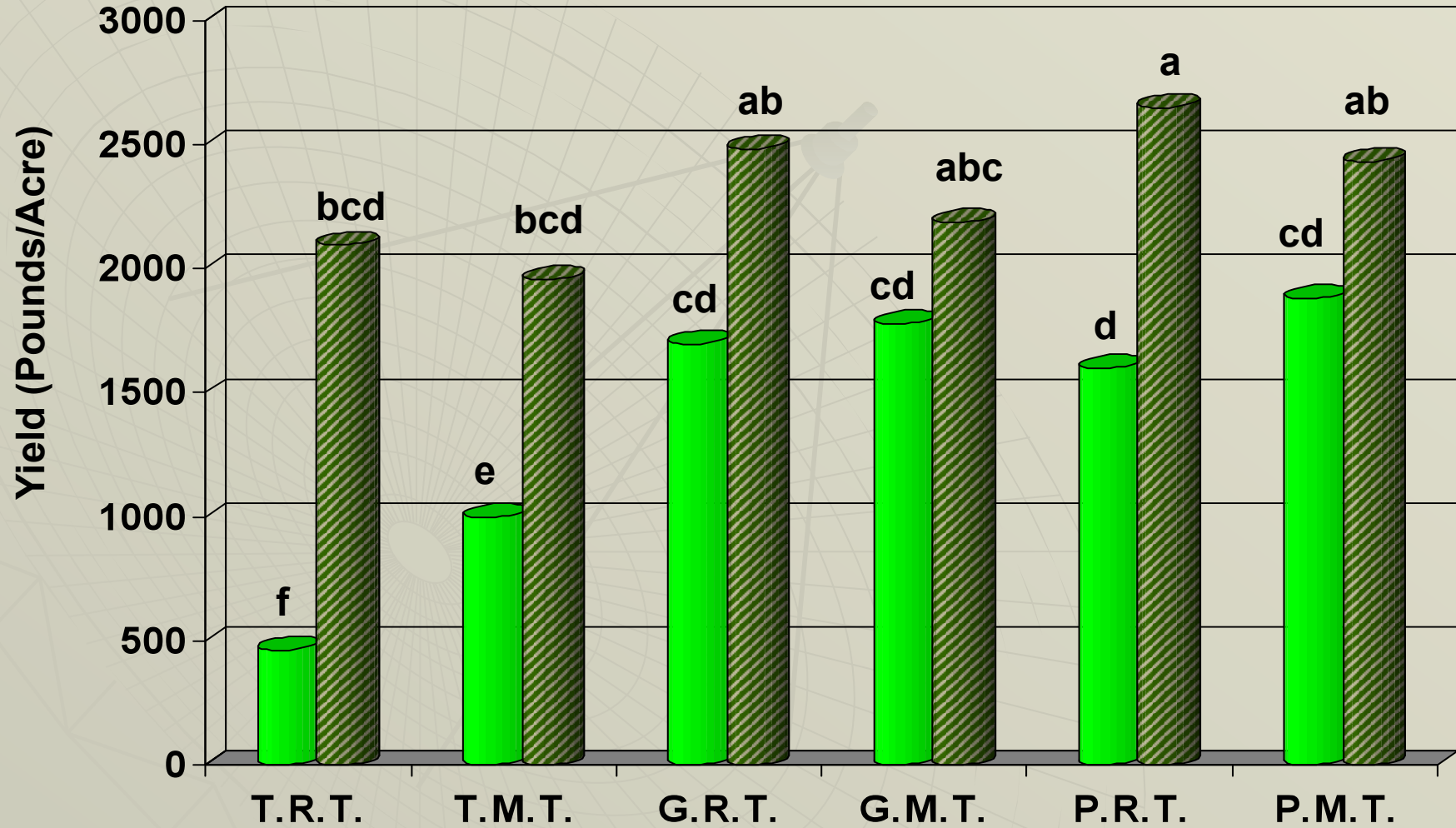




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Dry Weight Yield

■ Nontreated ■ Ridomil Gold



BIOFUMIGATION ?



➤ The use of plants containing biologically active compounds as rotation crops or green manures to suppress soilborne pests and diseases, mostly brassica (crucifer) plants

➤ During Brassica degradation non-volatile molecules called glucosinolates are broken down to release chemicals (isothiocyanates or mustard oils) which are toxic to root pathogens

CONCLUSIONS

VIGOR AND PLANT HEIGHTS
TENDED TO BE GREATER
WITH CROP ROTATION

CONCLUSIONS

% ROOT ROT MIRRORED %
SYMPTOMATIC BLACK SHANK

OBJECTIVES

EVALUATE GLUCOSINILATE
PRODUCING COVER CROPS FOR
BLACK SHANK MANAGEMENT

PLANT VIGOR AND PLANT HEIGHT

Treatment	Product Rate	Vigor	Height Measurement
1. Ranman (cyazofmid)	5.0 oz/A	8.0 a	59.8 a
2. Zampro (ametoctradin + dimethylmorph)	10.0 oz/A 14.0 oz/A (At Layby)	8.0 a	60.4 a
3. Revus (mandipropamid)	10.0 oz/A	7.8 ab	56.6 a
4. Presidio (fluopicolide)	4.0 oz/A	8.6 a	59.6 a
5. Ridomil Gold 4 SL (mefenoxam)	1.0 pt/A	7.9 ab	63.5 a
6. BS-EXP	19.2 oz/A	8.6 a	63.7 a
7. Reason (fenamidone)	15.0 oz/A	8.0 a	63.2 a
8. <u>Non-treated Control</u>	N/A	7.0 b	56.8 a

CONCLUSIONS

ROTATION AWAY FROM
TOBACCO GREATEST
DECREASE IN BLACK SHANK

CONCLUSIONS

MUSTARD COVER CROP
TENDED TO DECREASE
BLACK SHANK

CONCLUSIONS

ROTATIONS INCREASED
YIELD IN NON RG PLOTS

PERCENT TOMATO SPOTTED WILT

Treatment	Product Rate	% Symptomatic TSWV
1. Ranman (cyazofmid)	5.0 oz/A	2.4 ab
2. Zampro (ametoctradin + dimethylmorph)	10.0 oz/A 14.0 oz/A (At Layby)	5.7 ab
3. Revus (mandipropamid)	10.0 oz/A	6.5 ab
4. Presidio (fluopicolide)	4.0 oz/A	0.8 b
5. Ridomil Gold 4 SL (mefenoxam)	1.0 pt/A	3.3 ab
6. BS-EXP	19.2 oz/A	7.2 a
7. Reason (fenamidone)	15.0 oz/A	0.9 b
8. Non-treated Control	N/A	3.0 ab

CONCLUSIONS

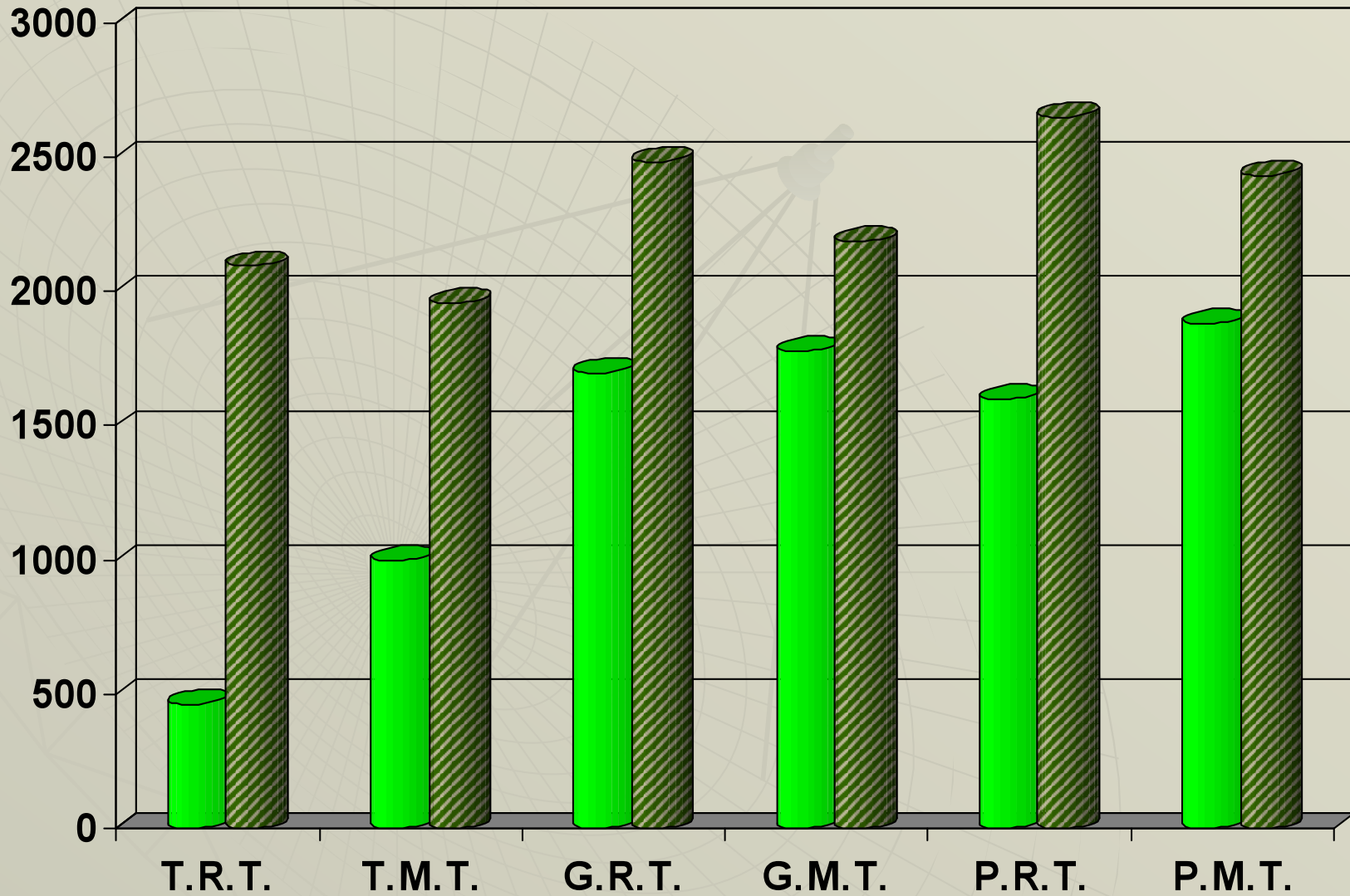
RIDOMIL GOLD TREATED PLOTS
SIMILAR ..BUT YIELD TENDED TO
BE HIGHER WITH ROTATIONS





YIELD

■ Nontreated ■ Ridomil Gold



Rotation Scenarios

Treat	2004 Spring	2004 Fall	2005 Spring
1	Tobacco	Rye (cover)	Tobacco
2	Tobacco	Mustard (cover)	Tobacco
3	Rye (Grain)	Rye (cover)	Tobacco
4	Rye (Grain)	Mustard (cover)	Tobacco
5	Peanut	Rye (cover)	Tobacco
6	Peanut	Mustard (cover)	Tobacco

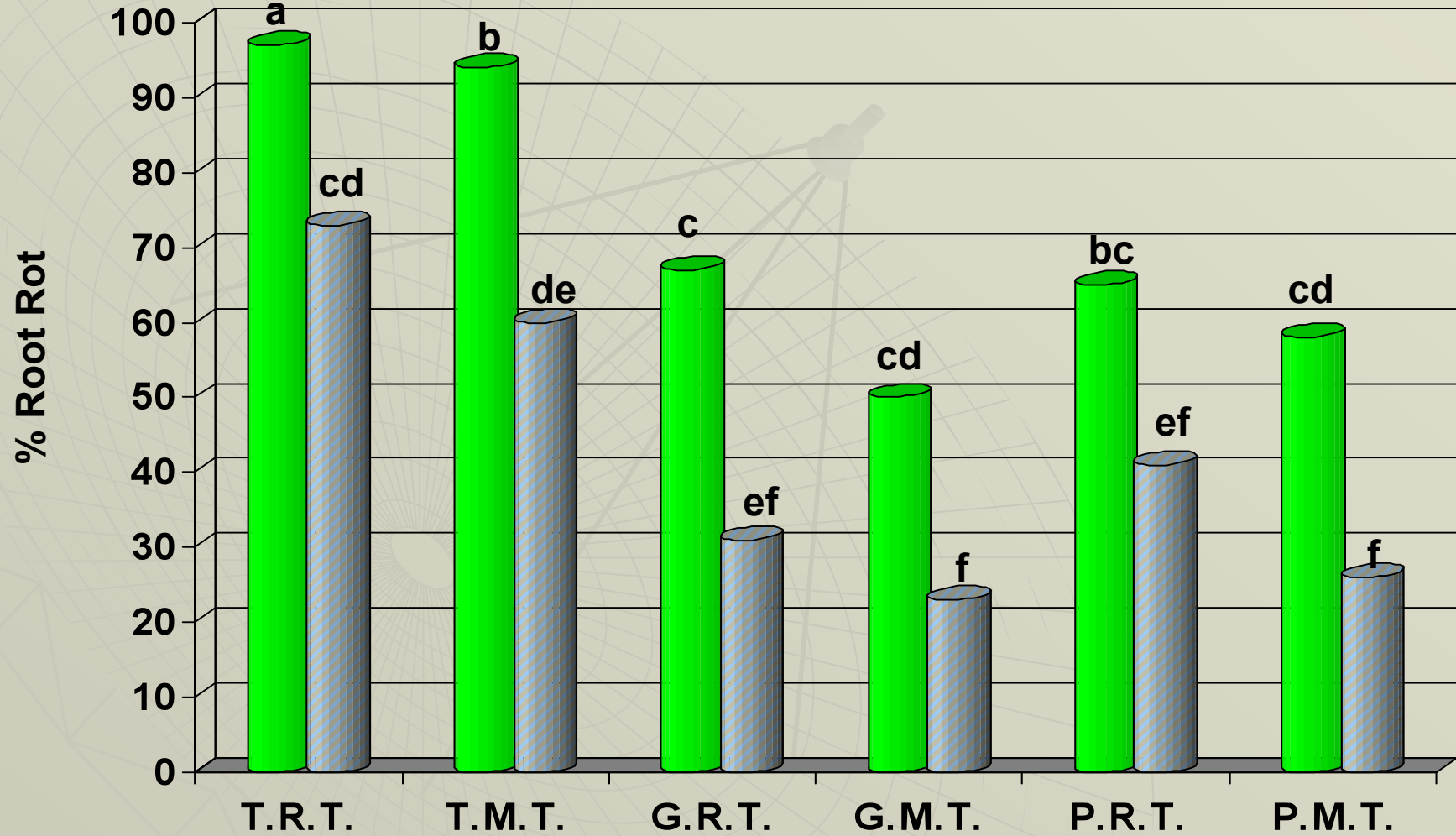


BLACK SHANK

MANAGEMENT WITH
COMBINATIONS OF ROTATION
COVER CROPS AND METALAXYL

% Root Rot

■ Nontreated ■ Ridomil Gold



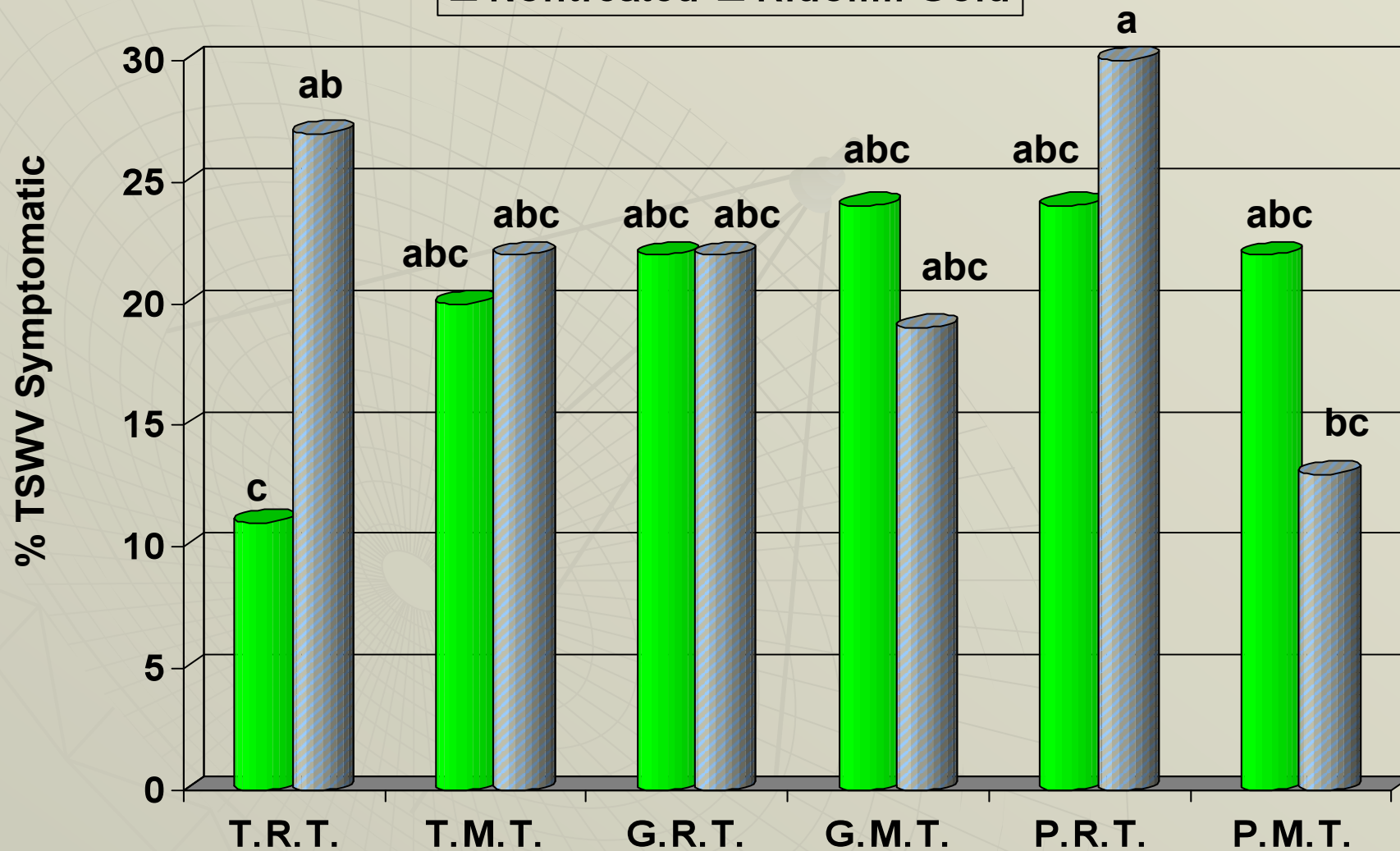


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% TSWV Symptomatic

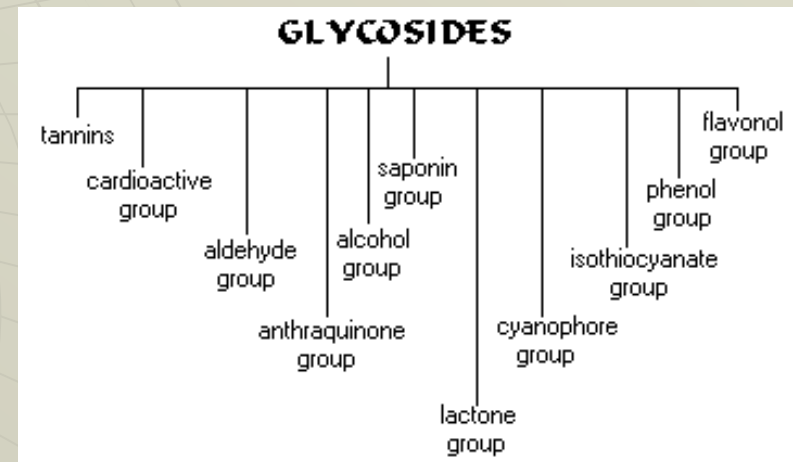
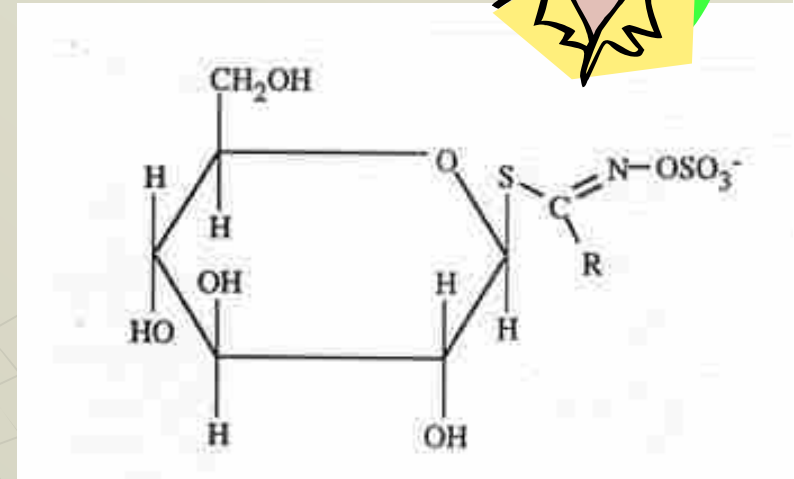
■ Nontreated ■ Ridomil Gold



GLUCOSINOLATES...WHAT ?



- **Glucosinolates** defensive compounds
- **'Glooks'** are present in 16 families of plants
- **Brassicaceae: 350 genera, 3000 spp.; 100's spp.** investigated, all able to synthesize glooks
- **'Glook' types** (aliphatic, aromatic, indolyl) are highly variable among plants





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