

2018: Fumigation and IR-4



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Fumigation / Plasticulture

- **Past**
- **Present**
- **Future**

Farm Gate Value of Crops on Plastic in Georgia

Georgia Farm Gate Values – State Wide		
Crop	----- Plasticulture -----	
	Acres	Farm Gate Value
Banana & Hot Pepper	873	\$4,321,351
Bell Pepper	5,634	\$108,814,073
Cabbage	3,258	\$18,391,145
Cantaloupe	3,582	\$21,968,530
Cucumber	5,983	\$41,202,770
Eggplant	1,454	\$17,339,586
Strawberry	405	\$9,871,698
Squash	2,756	\$12,529,938
Tomato	2,796	\$39,008,214
Watermelon	15,416	\$135,619,200
Zucchini	2,335	\$20,442,910
Total	44,492	\$429,509,415

Source: Georgia Farm Gate Value Report, The University of Georgia, Center for Agribusiness and Economic Development

Georgia Production on Plastic



Methyl Bromide

- **Over 50 years of use**

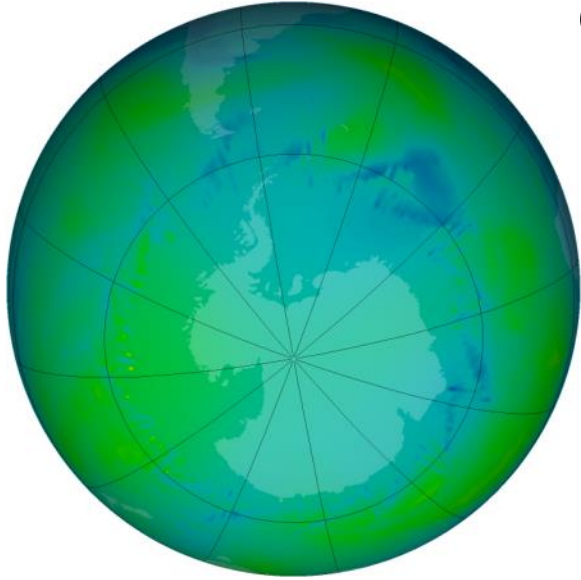
WEEDS, DISEASE, NEMATODES



Methyl Bromide

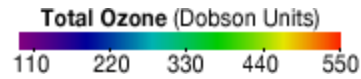
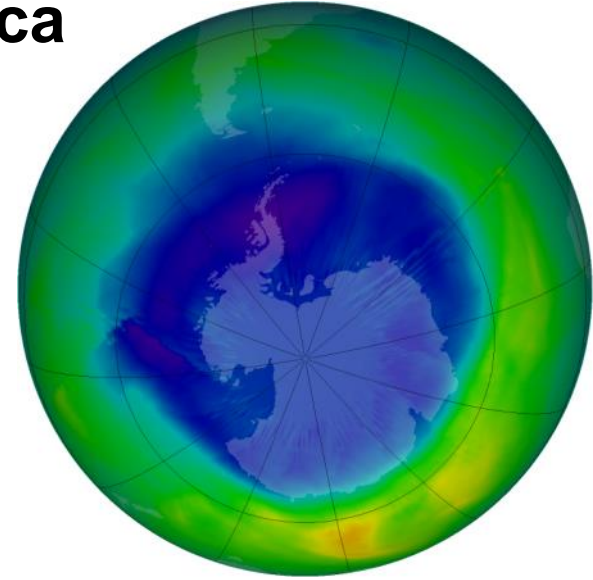
- **Over 50 years of use**
- **1990 Montreal Protocol and Clean Air Act: methyl bromide was classified as a class 1 ozone depleting substance and for its gradual removal from the market.**

1 August 2005

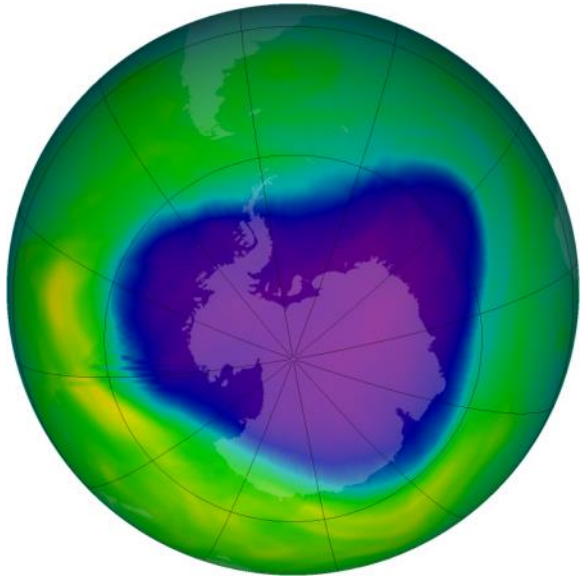


Ozone layer in Antarctica

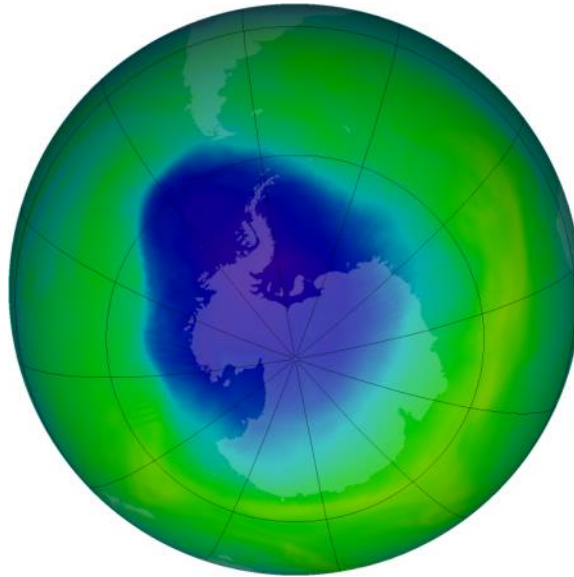
1 September 2005



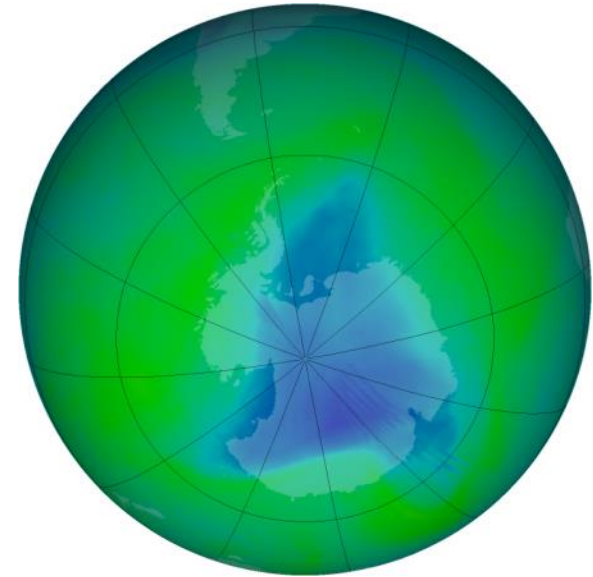
1 October 2005



1 November 2005



1 December 2005



Methyl Bromide Removal from the Market

➤ Production

1999 = 25% reduction

2001 = 25% reduction

2003 = 20% reduction

2005 = gone

(reduce methyl bromide ai over time)

Loss of Methyl Bromide in 2005



Methyl Bromide Uses

- **QPS** (Quarantine Pre Shipment) **gas**

- Non-Soil Use (imports/exports)

- Ex. wood

- Soil Use (mostly interstate movement)

- Ex. Pine tree seedlings

- **CUE** (Critical Use Exemption) **gas**

- Preplant soil fumigant applications

Methyl Bromide Critical Use Exemption



Pepper, Eggplant, Squash, Tomato, Melons, Cucumber



**Purple and Yellow Nutsedges:
Primary Weeds in a Plasticulture System**



Prescription Fumigation



A Few Specialty Crop Values

(Retail Value Per Acre 2014)

- 1. Watermelon (small bed mulch): \$9000**
- 2. Watermelon (large bed mulch): \$14,400**
- 3. Cantaloupe (small bed mulch): \$8666**
- 4. Pepper (raised mulch): \$22,400**
- 5. Tomato (raised mulch): \$33,600**
- 6. Blueberry (high bush): \$10,000**

Fumigant Systems For Weeds

1. Paladin Pic + Vapam TIF

All common
weeds

2. UGA 3-WAY* TIF

3. Paladin Pic TIF

Good nutsedge, watch
grass and pigweed

4. UGA 3-WAY LDPE

Watch nutsedge, good
grass and pigweed

5. Pic Chlor 60 TIF

Watch nutsedge, grass,
and pigweed...
...nematodes??

*UGA 3-WAY: system of Telone II, Pic, Metam

Telone II Application 12 to 14 " deep



**Chloropicrin placed
8 inches deep**



Low Nematode Levels

Pic Chlor 60 = 8-10 in. (21 G)

Metam Application with blades 4" apart applying metam 4" deep – no herbicide under mulch



Either LDPE or TIF Mulch Depending on Nutsedge Control Needed!



Selecting the Correct Mulch Can Be Challenging



Low or High Density Polyethylene
Virtually Impermeable Film
Totally Impermeable Film

Funnel glued to mulch and then left for a set amount of time

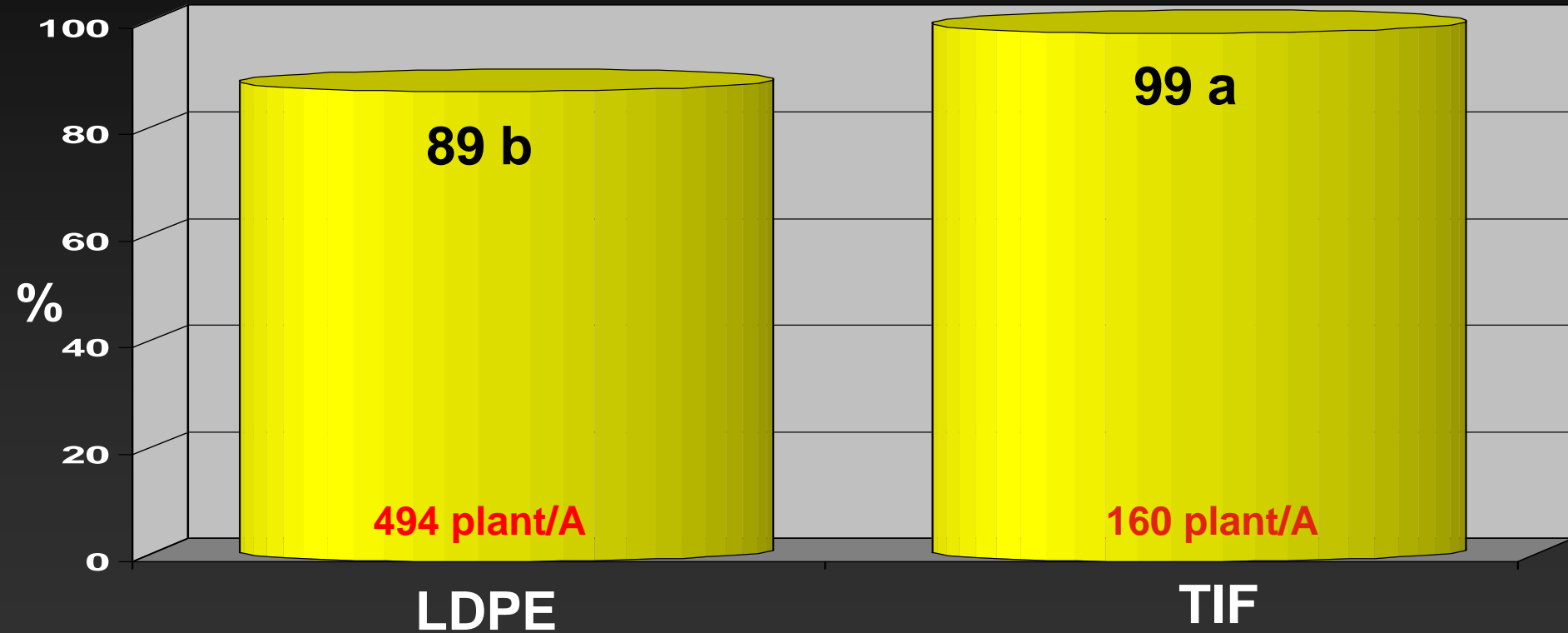


GASTEC GV100S

Silicone Glue

Detector Tube Range 0.1 to 18 ppm

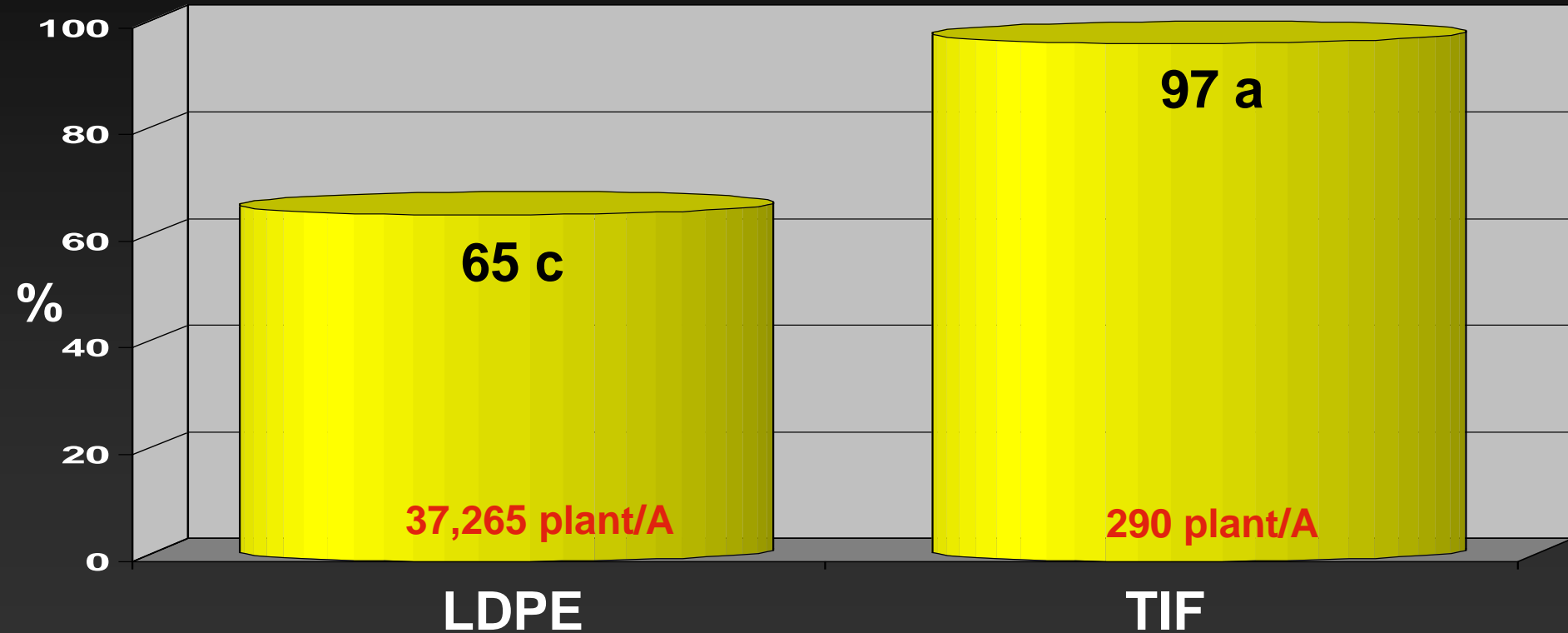
Nutsedge response to the 3-WAY. Tift Co., 2013.



Plots were 1 bed by 150 feet. Fall soil temp 84. (Veg 43-13)

82,460 plant/A check

Nutsedge response to the 3-WAY. Echols Co., 2013.



Plots were 1 bed by 150 feet. Spring soil temp 64. (Veg 13-13)

319,250 plant/A check

UGA 3-WAY. Fall 2013. Tift Co.



3-WAY; TIF

Check

Paldin Pic Systems

**BE CAREFUL FOR ODOR MANAGEMENT
MUST USE TIF MULCH**

**Trifecta/Paladin Pic
placed 8-10" deep**



Metam Application with blades 4" apart applying metam 4" deep



TIF
MULCH
ONLY

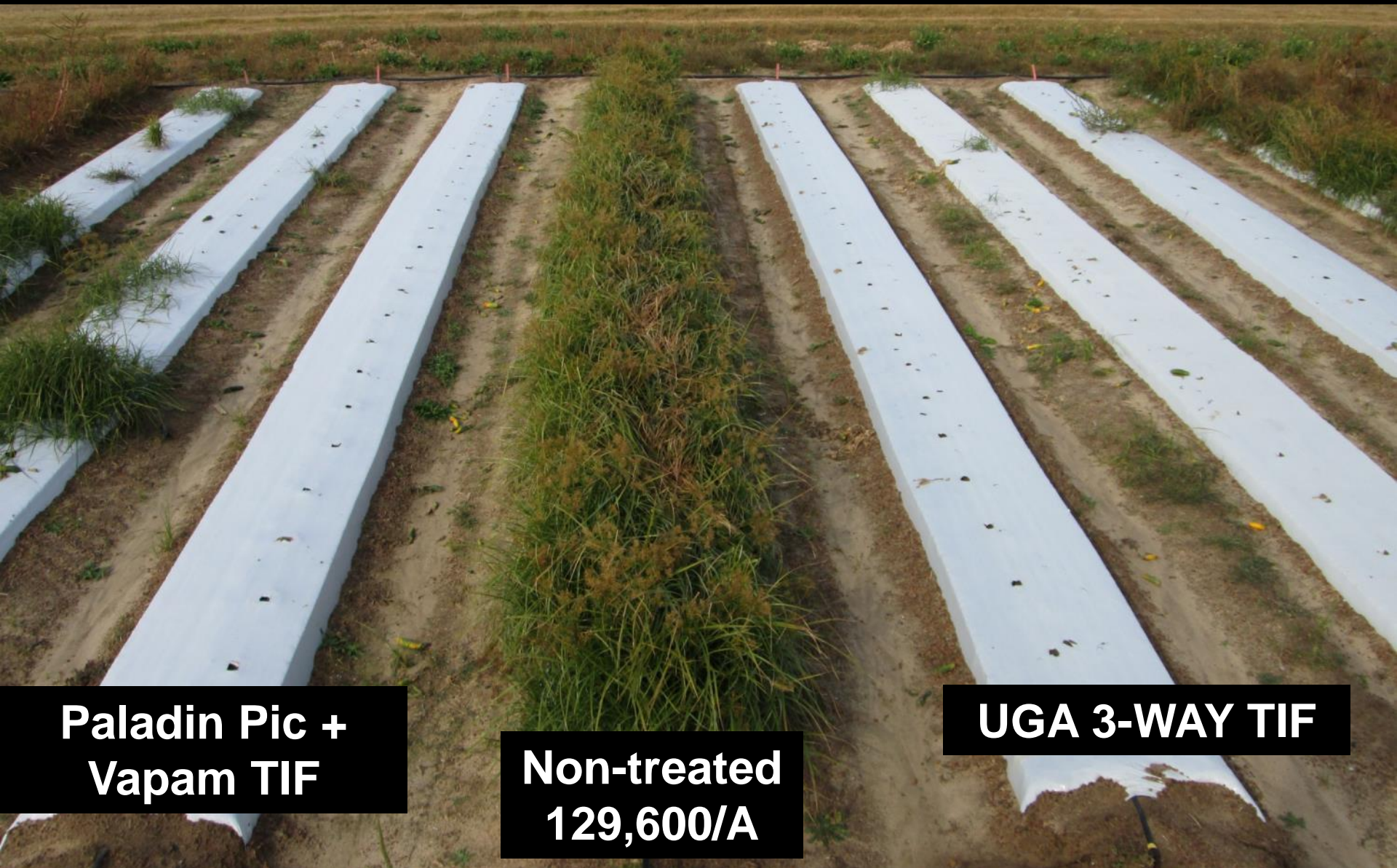


Paladin Pic + Vapam



Check

Nutsedge response to top tier fumigant systems. Tift County, 2014 - Fall.



**Paladin Pic +
Vapam TIF**

**Non-treated
129,600/A**

UGA 3-WAY TIF

Production Challenges - #1



Factors Influencing Rate/Control

F
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E

We can influence quite quickly if willing!!!!

- 1. Higher populations of nutsedge**
2. Warmer soil temperatures
3. Low moisture conditions (not wet either)
4. Soft bed (compaction)
5. Lighter texture the soil

Managing Nutsedge YEAR ROUND

1. Select the right fumigant system
2. Sandea in crop when feasible
3. Sandea row middles
4. Spray as soon as crop done:

Production Challenges - #2

BED FORMATION



Proper bed facilitates better fumigant, water & fertilizer movement

Factors Influencing Rate/Control

F
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1.

1. Higher populations of nutsedge
2. Bed formation (150 lb person sink ½ inch)
3. Moisture (avoid dry; avoid wet)
4. Soil temperatures (cool good; hot bad)
5. Soil texture (“lighter” texture less control)

INFLUENCE CONCENTRATION OVER TIME

Production Challenges - #2

BED FORMATION

150 lb person sinks 1/2-1"
-double press
-shrink pan



Proper bed facilitates better fumigant, water & fertilizer movement

Production Challenges - #3

PLANT BACK INTERVALS

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concentration over time
(where the pest is located)



IR-4 Registrations Are Essential for Vegetable Producer Sustainability



Roger B. Batts
Field Research Director, NCSU IR-4 Center
and
Interim IR-4 Southern Region Field Coordinator



IR-4 Mission

Facilitating the regulatory approval of sustainable pest management technology for specialty crops and specialty uses to promote public well-being



Regulation of Pesticide Residues on Food

We set tolerances, which are the maximum amount of a pesticide allowed to remain in or on a food, as part of the process of regulating pesticides. In some countries tolerances are called maximum residue limits (MRLs).

About Tolerances



- [Introduction to tolerances](#)

Setting and Revoking Tolerances

Finding Tolerances



- [How to search for tolerances](#)

Tolerance Tools

Related Information

- [Pesticide registration](#)
- [Dietary risk assessment](#)
- [Find more pesticide information](#)



Why Is IR-4 Needed?

- Lack of Economic Incentive for Registrants
 - Development costs from ‘discovery to jug’ is estimated at \$250-350M
 - Limited patent life
 - Small acreage vegetable crops = relatively small amount of product sales
 - “Just not worth the registration expenses and efforts”
- Liability for Registrants
 - Vegetable crops generally have higher value
- This is not a new scenario. IR-4 was established by USDA in 1963 because of these same factors.

Who Benefits from IR-4

- Growers
 - Legal access to safe & effective pest management tools
 - Protect and sell a higher proportion of their crop
- Food Processors & Food Retailers
 - Consistent supply of materials
- Crop Protection Industry
 - Expanded registrations & potential sales
 - Exclusive Use of Data Extension
- Public
 - Plentiful and more economical supply of fruits & vegetables that contribute to a healthy diet.

No Herbicide



IMPORTANT NOTICE
U.S. LABEL - It is a violation of United States law to use this product in the United States in a manner inconsistent with its United States labeling.

GROUP 14 HERBICIDE

Reflex[®]
Herbicide

syngenta.

For Control of Certain Weeds in Cotton, Dry Beans, Potatoes, Snap Beans, and Soybeans

Active Ingredient/Guarantee
Sodium salt of tofenoxate
3-(2-chloro-4-difluoromethylphenoxy)-N-methylbutyl-5-oxoimidazole 22.8%*
Other Ingredients 77.2%
Total 100.0%

Reflex Herbicide is formulated as a soluble liquid.
Reflex Herbicide contains 1.2 herbicide/active ingredient (a.i.) as a pre-emergence.

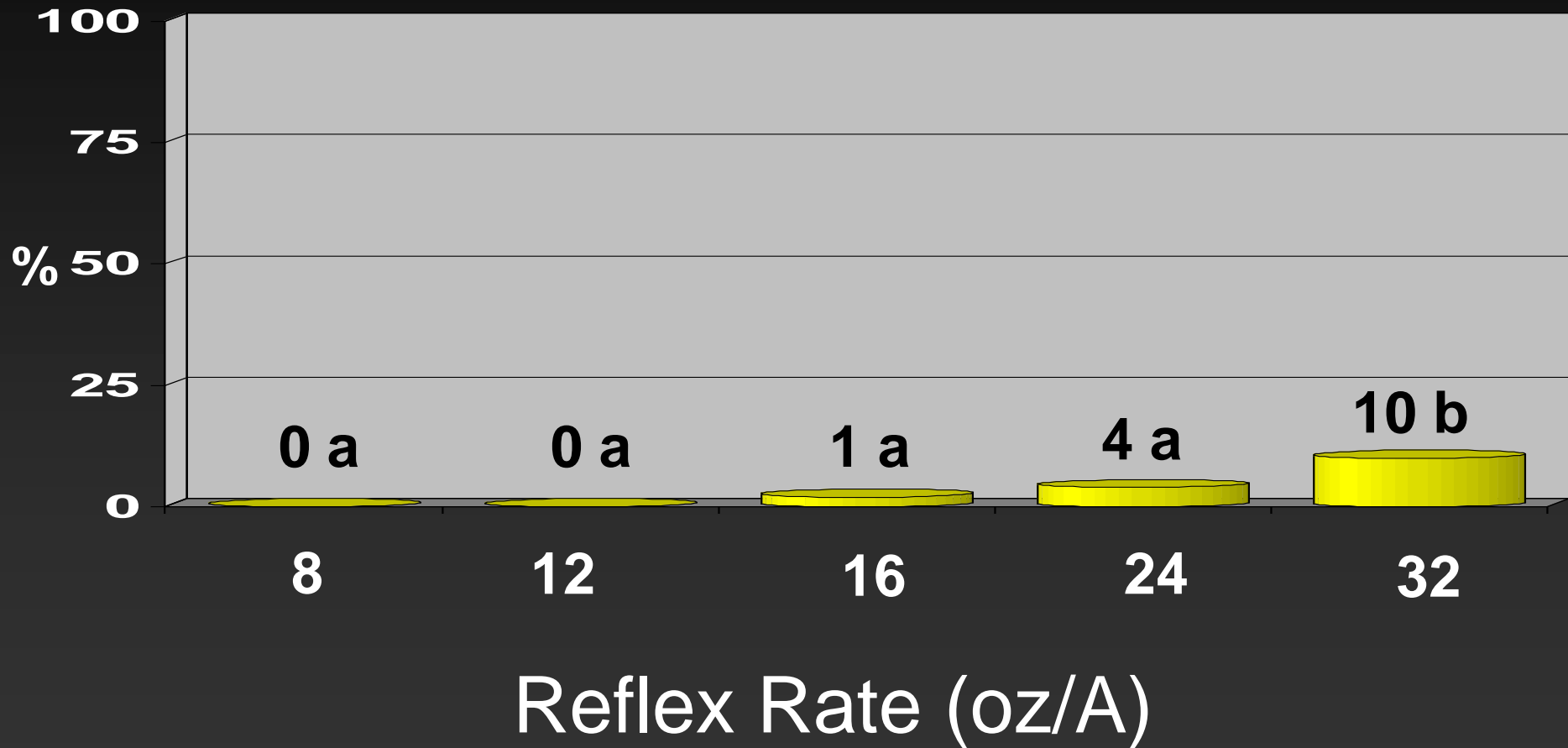
Reflex Herbicide is equivalent to 2.17% or 2 pounds per U.S. gallon or 240 grams per liter of tofenoxate active ingredient.

**KEEP OUT OF REACH OF CHILDREN.
DANGER/PELIGRO**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)
The label and packaging are trademarks and registered trademarks of Syngenta.

Reflex 16 oz/A

Visual Eggplant Injury to Reflex Preplant. TyTy, GA. 2017. 26-29 DAT.



*Values followed by the same letter are not different at P = 0.05. Data combined over 2 runs.

How IR-4 Helps (cont'd)

- **Crop Groups and Crop Group Expansion**
 - EPA Crop Groups are based primarily on similar taxonomy and similar growth habits. Tolerances established on a the 'representative crop' of a CG apply to all crops in that CG. More 'bang for the buck'.
 - Placing 'orphan crops' into established EPA crop groups can automatically get a tolerance applied to that crop. (Ex: Reflex/Eggplant)
- **Harmonization of International MRLs**
 - Different tolerance levels for the same product/crop combination in different countries can constrict trade.
 - IR-4 leading international efforts to harmonize MRLs = 'level playing field'



INDUSTRY

Georgia Department of Agriculture

Commissioner Gary Black



New Vegetable Herbicide Uses - Last 10 Yr

- 1. Chateau tomato RM**
- 2. Chateau pepper RM**
- 3. Chateau eggplant RM**
- 4. Chateau watermelon RM**
- 5. Chateau cantaloupe RM**
- 6. Chateau cucumber RM**
- 7. Chateau squash RM**
- 8. Chateau cabbage RM**
- 9. Dual Magnum pepper topical**
- 10. Dual Magnum broccoli topical**
- 11. Dual Magnum cabbage topical**
- 12. Dual Magnum collards topical**
- 13. Dual Magnum cauliflower topical**
- 14. Dual Magnum kale topical**
- 15. Dual Magnum watermelon RM**
- 16. Dual Magnum cantaloupe RM**
- 17. Dual Mag. carrot topical**
- 18. Dual Mag. sweet potato**
- 19. Dual Mag. tomato topical**
- 20. Dual Mag. snap bean topical**
- 21. Dual Mag. lima bean topical**
- 22. Dual Mag. southern pea topical**
- 23. Dual Mag. squash topical**
- 24. Caparol in Okra**
- 25. Sandea in Okra**
- 26. Reflex tomato preplant**
- 27. Reflex pepper preplant**
- 28. Reflex in Watermelon**
- 29. Reflex in Squash**
- 30. Reflex in Pumpkin**
- 31. Treflan – Intercropping**
- 32. Dual Magnum - pumpkin**



**We're from the government, we're
here to help!**

Learn More About IR-4:

<http://ir4.rutgers.edu/>