



# Field Corn Weed Management Update

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THE UNIVERSITY OF GEORGIA

COLLEGE OF AGRICULTURAL & ENVIRONMENTAL SCIENCES


# 2013 Field Corn Weed Science Issues



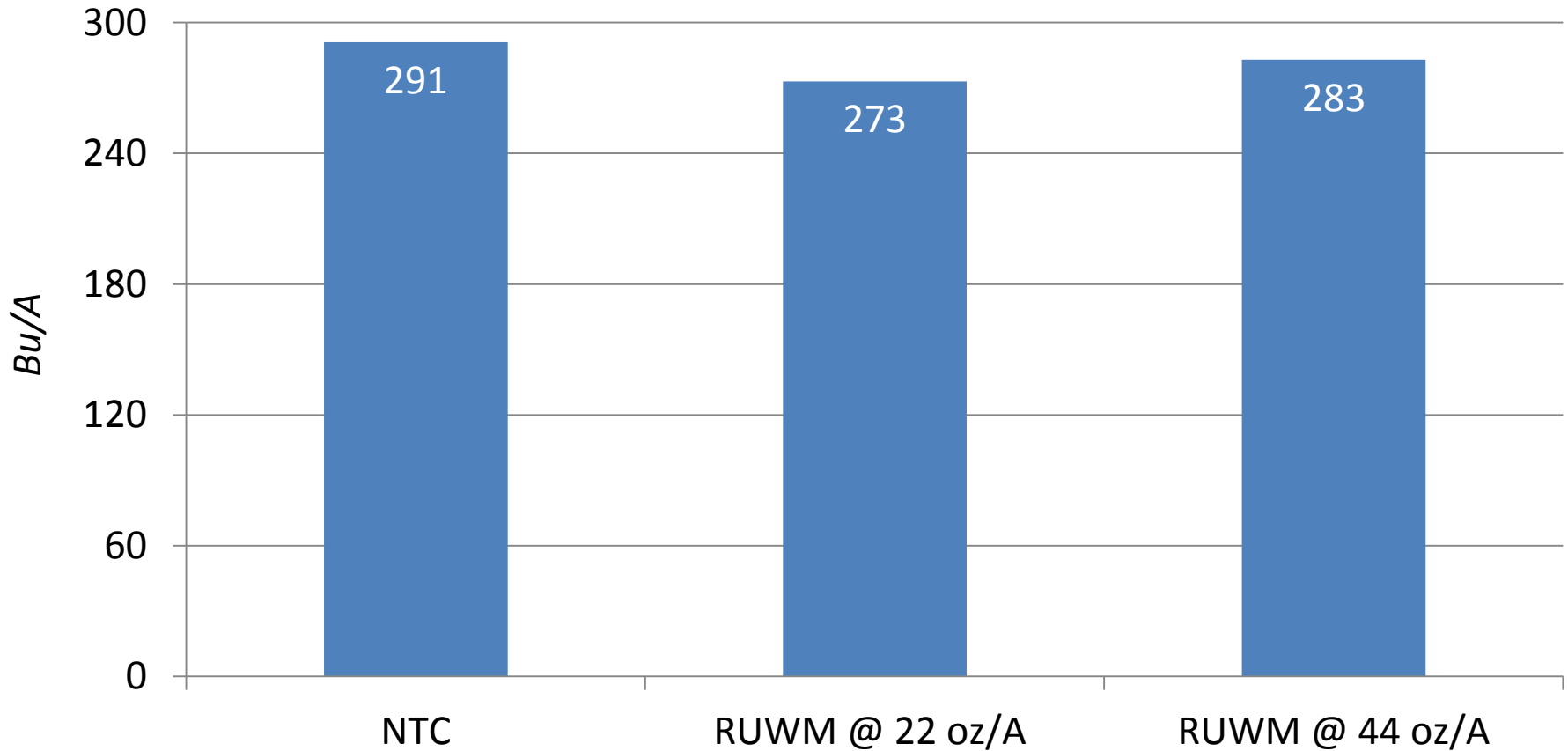
- ◆ RR1 vs. RR2 Hybrids
- ◆ Steadfast Q on ALS Sensitive Hybrids
- ◆ Strongarm carryover?
- ◆ Atrazine/Roundup Mixing Issues
- ◆ Late-Season Morningglory
- ◆ Pest Control Updates



# RR1 vs. RR2 Hybrid – The Issues

- ◆ different trait events
    - *RR1 = GA21 (1998)*
    - *RR2 = NK603 (2001)*
  - ◆ different rate/timing structures
    - *RR1: 0.75 lb ae/A, 2 apps, 30" or V8*
    - *RR2: 0.75-1.12 lb ae/A, 2 apps, 30" or V8, 30-48 (drops)*
  - ◆ Some glyphosate brands no longer listed RR1 on their label?
  - ◆ How tolerant are RR1 hybrids?
- 

# RR1 Field Corn (Pioneer 2023BVT) Yield Response to Roundup WeatherMax



**$P = 0.2275$**   
 **$CV = 3.8$**

*Applied 28 DAP, V5, 5" tall corn  
All trts included Aatrex 4L @ 64 oz/A  
+ COC @ 1% v/v*

# Corn Hybrid/Herbicide Interactions



- ◆ some corn hybrids are sensitive to certain herbicides
- ◆ Companies screen for tolerance to .....

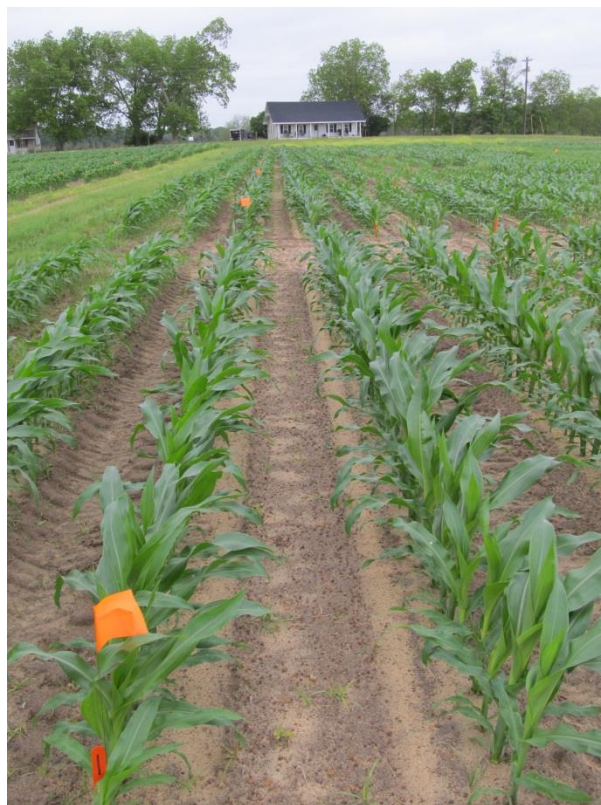
  - *Amides (Dual)*
  - *Benzoic Acid/phenoxy – (dicamba)*
  - *HPPD (Callisto)*
  - *ALS (Steadfast)*

- ◆ DuPont Q Products
  - *Steadfast Q, Resolve Q*
  - *Isoxadifen (safener)*

# DKC-6469 Response to Steadfast Q



Roundup WeatherMax @ 22 oz/A  
Aatrex @ 64 oz/A



Roundup WeatherMax @ 22 oz/A  
Steadfast Q @ 1.5 oz/A  
Aatrex @ 64 oz/A

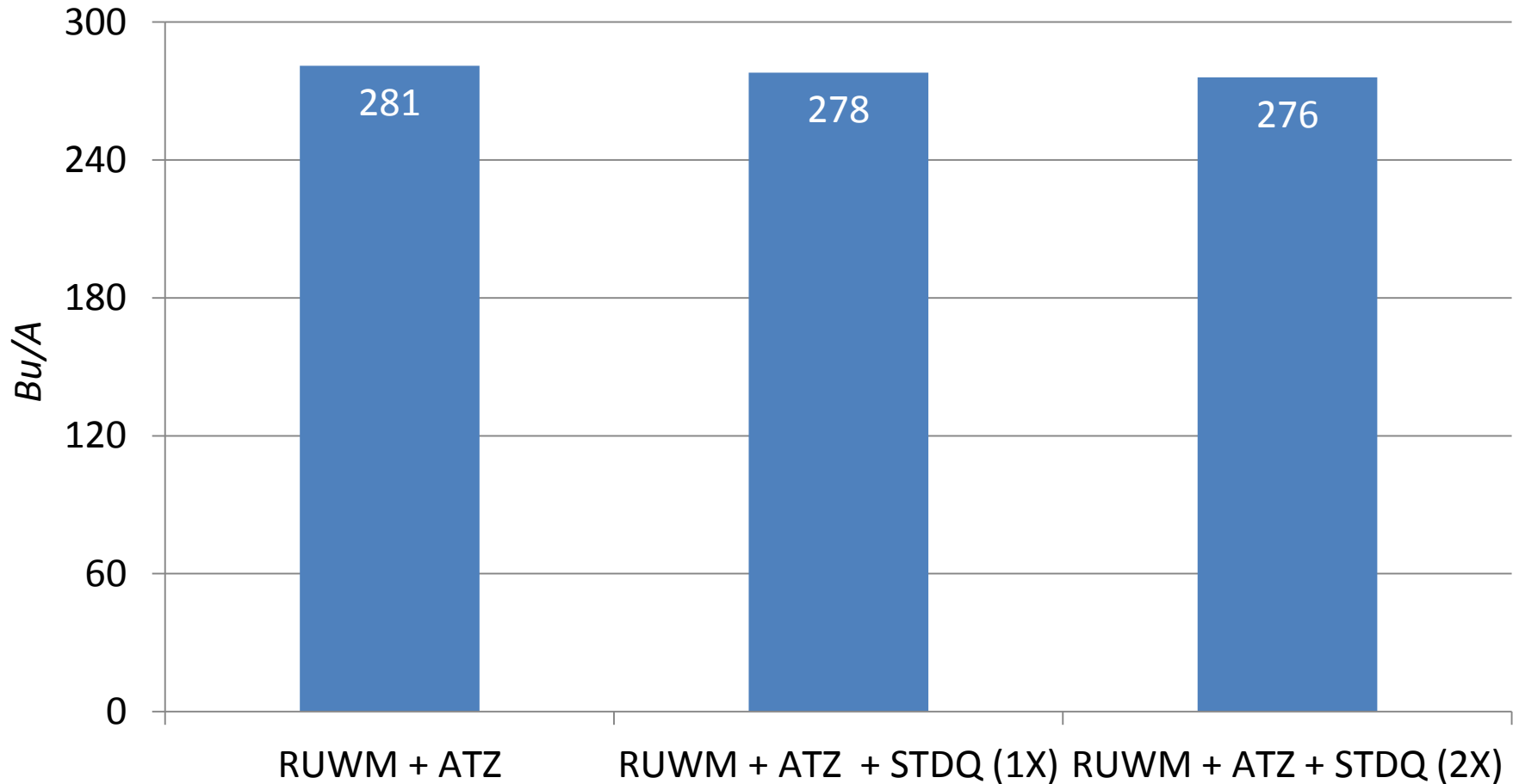


Roundup WeatherMax @ 22 oz/A  
Steadfast Q @ 3.0 oz/A  
Aatrex @ 64 oz/A

# 'DKC 64-69' Yield Response to POST

## Applications of Steadfast Q

*(RUWM @ 22 oz/A, ATZ @ 64 oz/A, STDQ @ 1.5 or 3 oz/A)*



*P = 0.5017  
CV = 1.75*

*Applied 28 DAP  
V4, 6" tall corn*

# Field Corn/Strongarm Concerns



**Dow AgroSciences**

## Strongarm<sup>\*</sup>

For Broadleaf Weed Control in Peanuts

Active Ingredients:

diclosulam: N-(2,6-dichlorophenyl)-5-ethoxy-7-fluoro[1,2,4]triazolo-[1,5-c]pyrimidine-2-sulfonamide ...	84%
Inert Ingredients .....	16%
Total.....	100%

Contains 0.84 pounds of active ingredient per pound of product.  
U.S. Patent No. 5,163,995

**Keep Out of Reach of Children**

**CAUTION PRECAUTION**

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.)

Refer to back panel of bag for additional precautionary information including Personal Protective Equipment (PPE) and User Safety Recommendations.

**Herbicide** Net Wt [5 x (2 x 0.45 oz)] water soluble packets

**Agricultural Use Requirements**  
Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. Refer to label booklet under "Agricultural Use Requirements" in the Directions for Use section for information about this standard.

**Notice:** Read the entire label. Use only according to label directions. **Before buying or using this product, read "Warranty Disclaimer" and "Limitation of Remedies" inside label booklet.**

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994. If you wish to obtain additional product information, visit our web site at [www.dowagro.com](http://www.dowagro.com).

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.  
EPA Reg. No. 62719-288  
EPA Est. 46275-IL-2  
900-006954 / 00128019

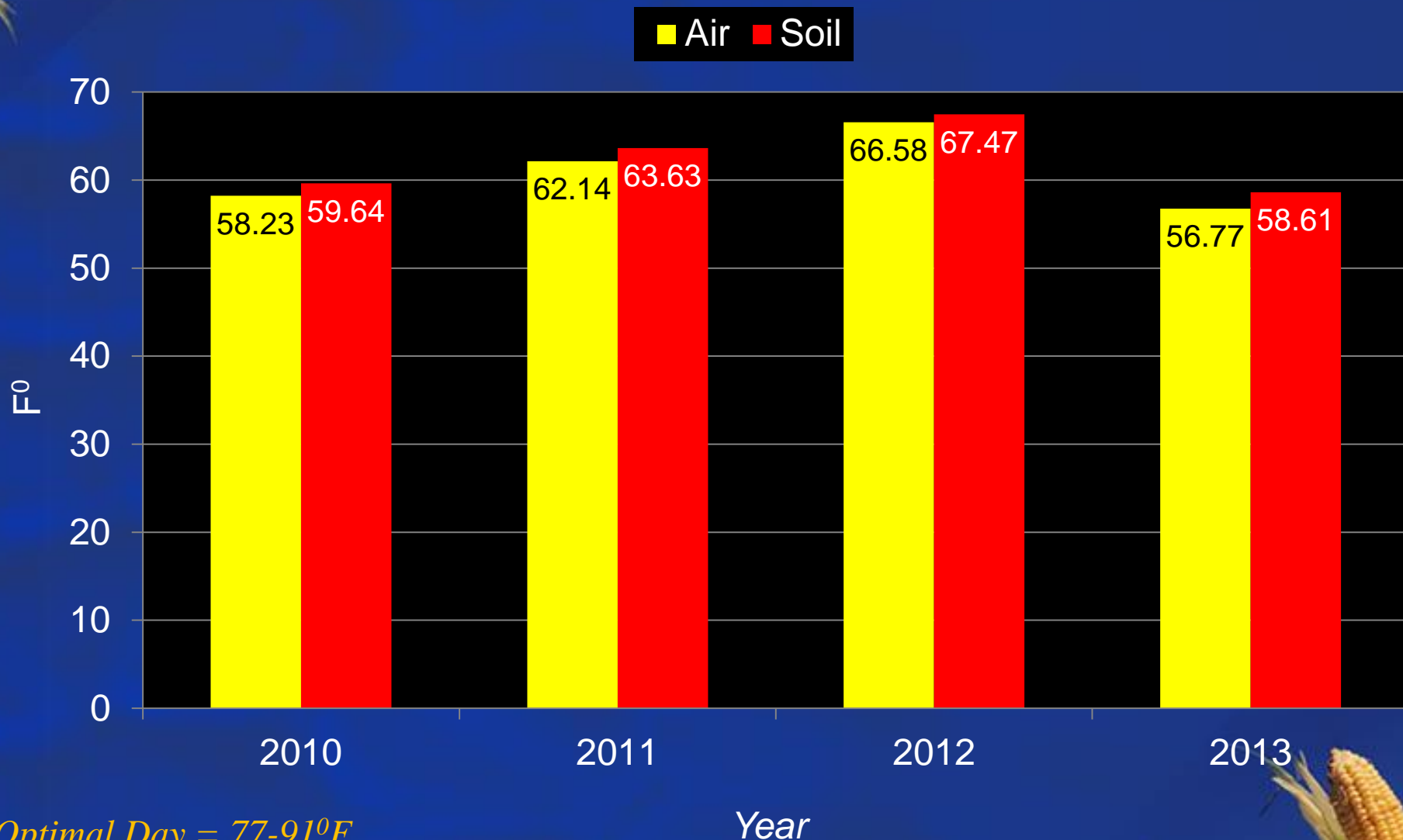
\*Trademark of Dow AgroSciences LLC  
Dow AgroSciences LLC • Indianapolis, IN 46268 U.S.A.

- ◆ Increases in corn acres
- ◆ GA Harvested Acres
  - ➔ 2012 = 310,000
  - ➔ 2013 = 450,000
- ◆ Corn is a great rotation for peanut!
- ◆ **Strongarm has 18 month rotation restriction for field corn**
- ◆ Reported ½-life is 33-65 days (*WSSA Herbicide Handbook*)

# Turner County Field Problem - 2013

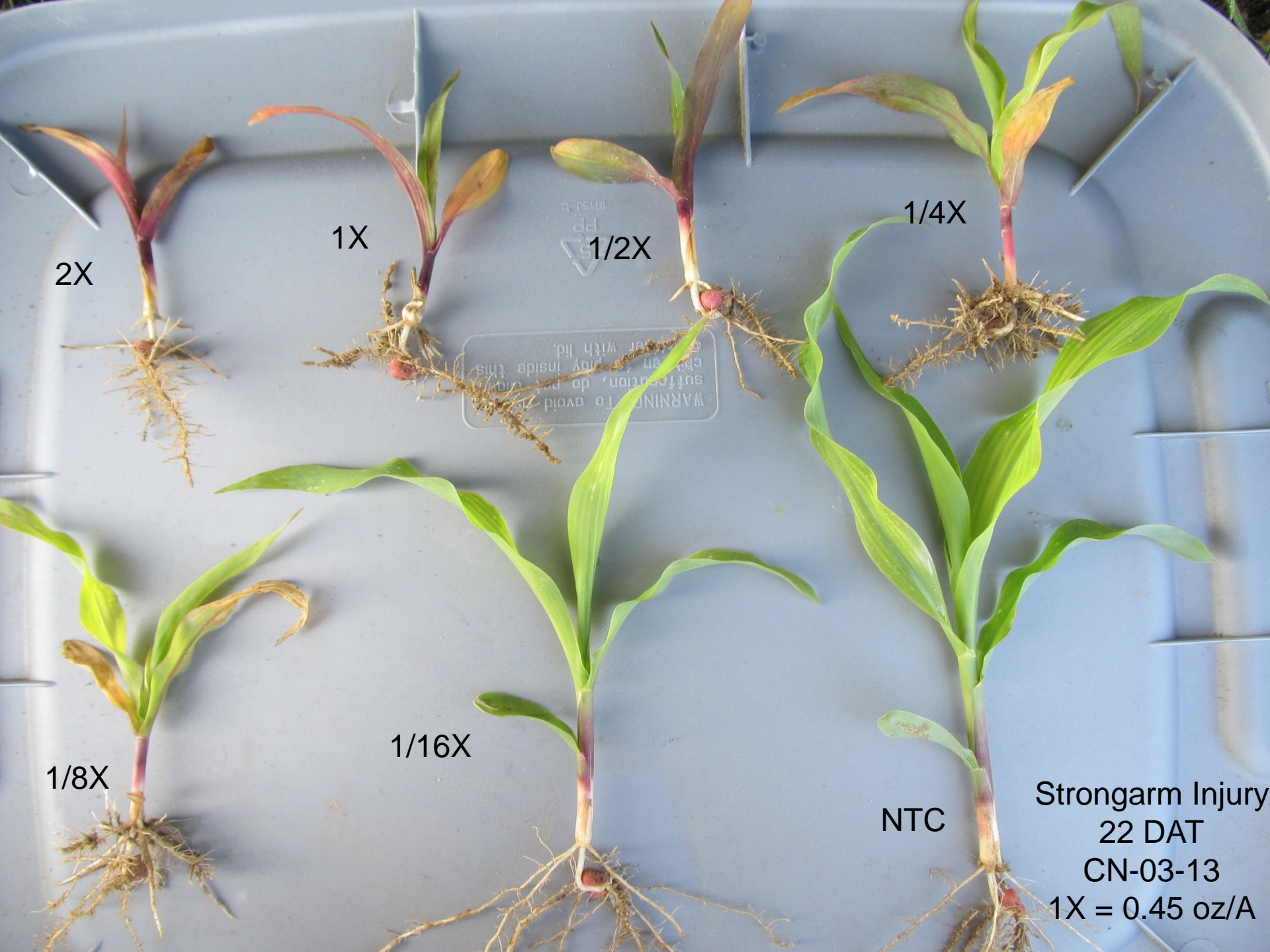


# Average Daily Air and Soil (2") Temperatures March 1-April 15 (UGA Ponder Farm)



*Optimal Day = 77-91°F*

*Optimal Night = 62-74°F*



2X

1X

1/2X

1/4X

1/8X

1/16X

NTC

Strongarm Injury

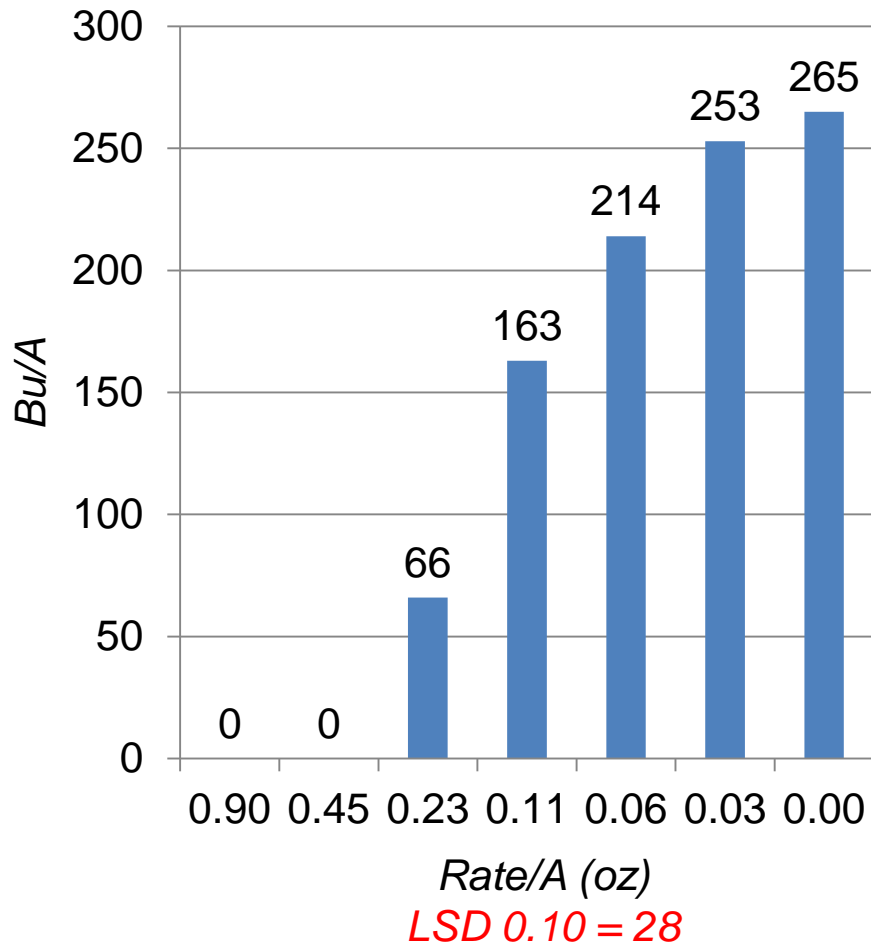
22 DAT

CN-03-13

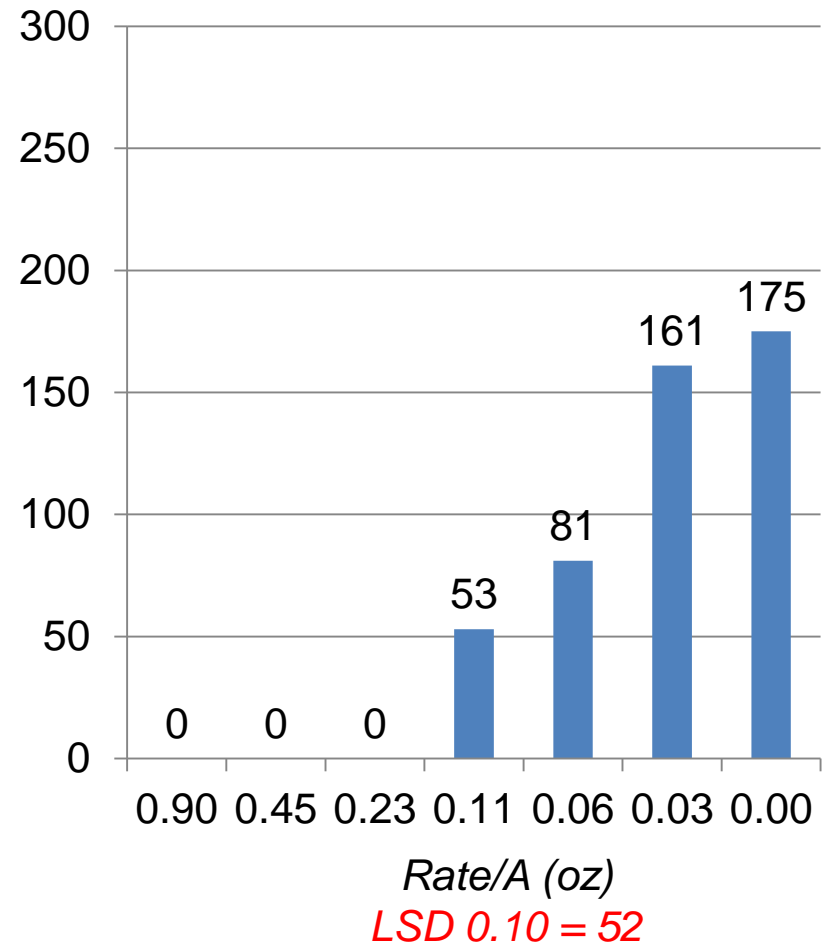
1X = 0.45 oz/A

# Field Corn Yield As Influenced by PRE Applications of Strongarm 84WG - 2013

## Tifton



## Attapulgus



# Strongarm/Field Corn

- ◆ Assuming normal degradation, it is highly probable that field corn could be planted after 5 ½-lives (165-325 days) rather than 540 days (18 months) currently labeled.



**Dow AgroSciences**

## Strongarm\*

For Broadleaf Weed Control in Peanuts

Active Ingredients	
diclosulam-N-(2,4-dichlorophenyl)-5-ethoxy-7-fluoro[2,4]triazolo-[1,5-c]pyrimidin-2-sulfonamide	94.9%
Inert Ingredients	1.6%
Total	100%

Contains 0.84 pounds of active ingredient per pound of product.  
U.S. Patent No. 5,163,995

**Keep Out of Reach of Children**  
**CAUTION PRECAUCION**

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**Herbicide** Net Wt [5 x (2 x 0.45 oz)] water soluble packets

# Atrazine/Roundup Mixing Compatibility



- ◆ Does not happen all the time?
- ◆ Cold water temperatures
- ◆ Low water volumes
- ◆ Mixing order
- ◆ Less likely with generic glyphosates?



**Flowable Co-Herbicide Compatibility with Roundup® Brand Agricultural Herbicides**

Roundup® brand agricultural herbicides can be tank-mixed with herbicides to provide residual weed control, a broader weed control spectrum, or an alternate mode of action. Refer to various product labels for directions and lists or identification of potential tank-mix partners. Screens and nozzles can become blocked by the formation of gel or sludge when products are incompatible<sup>1</sup>. Tank-mix incompatibility may also cause a product to settle out in the solution, reducing the herbicide's effectiveness and ease of application.

Certain flowable co-herbicides such as atrazine and diuron may be tank-mixed with Roundup agricultural herbicides. However, to assure the products remain dispersed in the mixture, agitation should be maintained and certain compatibility agents may help. For flowable herbicides, the active ingredient is in the form of a finely ground powder mixed with a small amount of emulsifier and suspended into a liquid. If left without agitation these products will settle out over time even in the absence of Roundup agricultural herbicides. Always predetermine the compatibility of all tank-mix products together in the carrier by mixing small proportional quantities in advance, also known as the compatibility jar test.

**Recommendations for Successful Tank-mix Applications**

- Spray volumes less than 10 GPA may lead to inconsistent weed control.
- Avoid very cold well water. Allow the water time to warm up prior to adding products.
- To aid in the compatibility include Ammonium Sulfate (AMS), 28% or 32% Urea Ammonium Nitrate (UAN), or a compatibility agent that contains phosphate ester when glyphosate is tank-mixed with atrazine, products containing atrazine, Direx®, Cotton-Pro®, Caparol® and Cotoran®. Rates for UAN range from 1 to 4 qts per acre, with many recommendations at 2 qts per acre.
- Inclusion of a compatibility agent may also assist in minimizing the amount and size of flocculants and reduce the potential of clogging nozzles.
- Maintain agitation. If the mixture is allowed to settle, initiate agitation to re-suspend the mixture before spraying.
- Spray materials soon after mixing.
- Most water conditioners do not improve atrazine compatibility as water hardness and pH do not affect atrazine compatibility.

**Recommended Tank Mixing Order:**

Do not mix concentrates

1. Start and maintain agitation
2. Add AMS, UAN or a compatibility agent directly to the water, or even after a compatibility problems occur if agitation is available.
3. Add co-herbicides to water. For flowable formulations it is suggested to mix one part herbicide with 1 part water prior to introducing to the tank mixture.
4. Add Roundup® agricultural herbicide to the co-herbicide/water mixture.
5. Maintain constant agitation at all times until the contents of the tank are sprayed out.

Sources: <sup>1</sup> Agronomy Guide: Pest Management—Section 2 Compatibility of Pesticides. 2011-2012. Penn State Cooperative Extension. <http://extension.psu.edu>

<sup>2</sup> Roundup PowerMAX® Herbicide Product Label. 2010. Monsanto Company. 6302714-10.

**ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS.** Roundup PowerMAX®, Roundup Ready PLUS™, Roundup®, and Technology Development by Monsanto and Design® are trademarks of Monsanto Technology LLC. All other trademarks are the property of their respective owners. ©2011 Monsanto Company. CRB04082011.



# Morningglory Control in Field Corn



# Morningglory Control in Corn

- as much atrazine as possible
- 1.0 lb/A – PRE fb 1.5 lb/A – POST
  - small grain rotations
- 2,4-D, Clarity, Status, Aim, ET, Evik (PDIR)
- Liberty-Link® Corn Systems
- split applications of glyphosate (RR corn)
  - \* *1<sup>st</sup> application + atrazine*
- Harvest Aids
  - Aim
- Early-harvest



# Current GA Field Corn Weed Control

➤ For most in GA .....

➤ Atrazine +

➤ *Glyphosate (RR corn)*

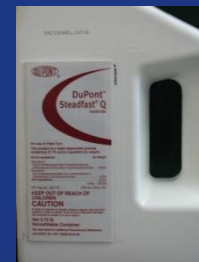
➤ *Liberty (LL corn)*

➤ *Steadfast Q*

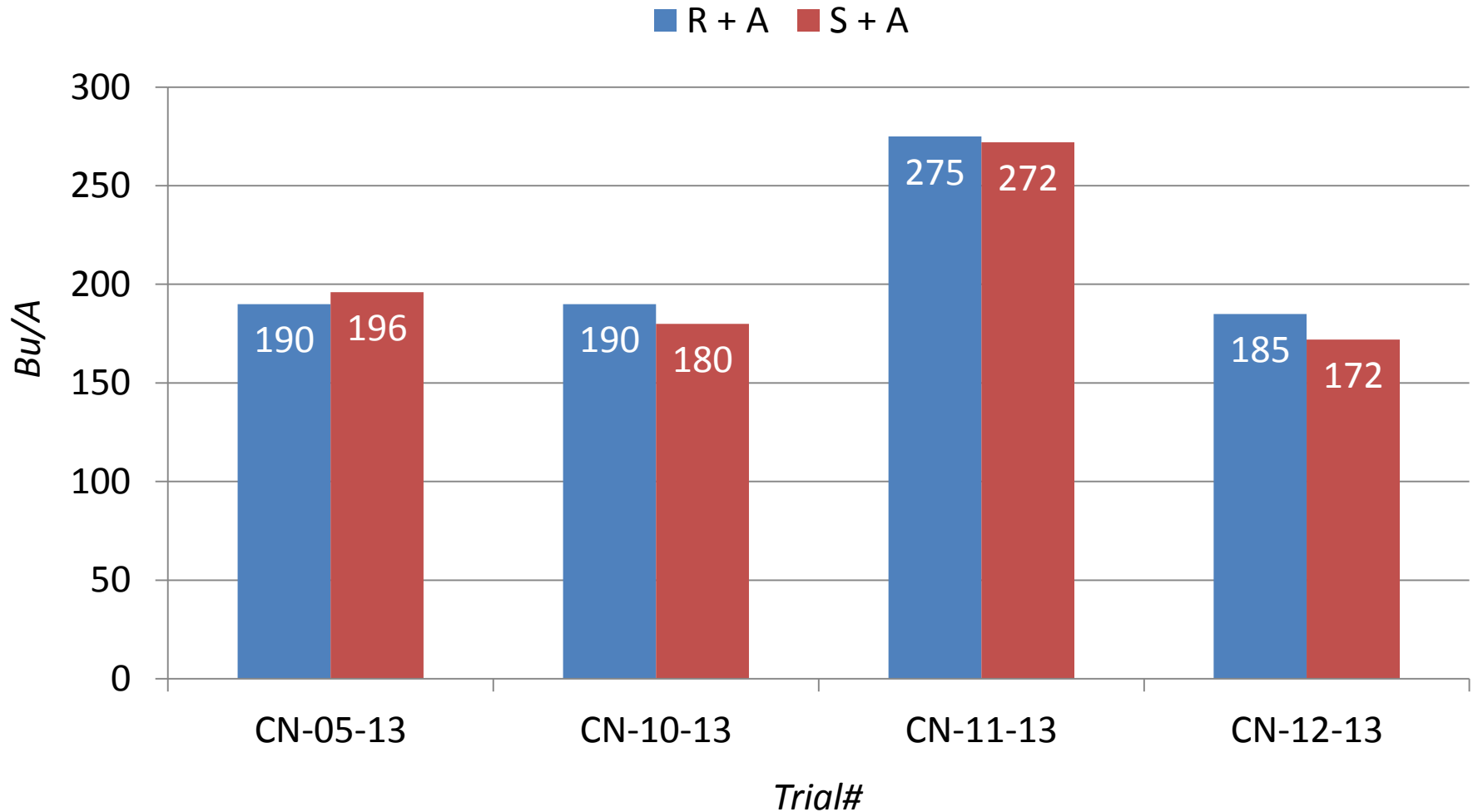
➤ *Laudis or Capreno*

➤ *Halex GT (glyphosate + Callisto + Dual)*

➤ If I was King, I would make every GA grower use 1 qt/A Atrazine PRE fb 1.5 qt/A + 1 of the above!



# Steadfast Q (S) + Atrazine (A) vs. Roundup (R) + Atrazine (A) - Corn Yields - 2013



★ Not significantly different at 0.10



# 2014 Field Corn Pest Control Handbook Changes

- ◆ POST timing table
- ◆ Valor burndown warning
- ◆ Deleted irrelevant products
- ◆ Zidua use rate on coarse soils (1.5 oz/A)
- ◆ New ryegrass control rec's
- ◆ Q products on any hybrid



- Zidua 85WG
- PPI, PRE, EPOST (V4)
- Pyroxasulfone (KIH-485)
- Residual control of annual grasses and certain broadleaf weeds including pigweed
- Same MOA as Dual or Warrant but used at lower rates. May also be better on FL beggarweed ?
- Use rates: 1.0-2.75 oz/A
  - **\$6.50/oz?**
- Registered June 2012

# Weed Control in Field Corn with Zidua – 2013



NTC



Zidua 85WG @ 2 oz/A (PRE)  
Roundup W-Max 5.5SL @ 22 oz/A (POST)  
Aatrex 4L @ 64 oz/A (POST)

CN-15-13  
May 28  
69 DAP

# Enlist™ Herbicide Tolerant Corn

## Robust Tolerance

- Robust tolerance to PRE and POST applications of 2,4-D
- Post application from emergence to V8
- Robust tolerance to FOP herbicides for breeding selection

2240 g ae/ha 2,4-D 2 DAT 2X max. use rate

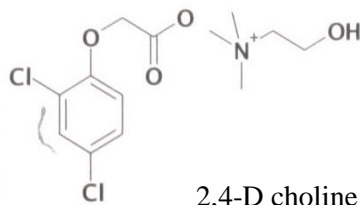


Brace Root Injury  
2,4-D 2240 g ae/ha



Dow AgroSciences  
SCIENCE. YIELD. SUCCESS.™

- tolerance to 2,4-D and Assure + GLY
- Colex-D™ technology
  - 2,4-D choline
  - lower volatility
  - lower drift potential
  - enhanced handling/mixing characteristics
  - reduced odor
- 1 PRE application + 2 POST applications (30" or V8 stage)
- Enlist™ Duo
  - DMA-Glyphosate (1.71 lb ae/gal) + 2,4-D choline (1.63 lb ae/gal)
  - 3.5 pt/A
- **2015** Product Launch (Mid-West)
- Monsanto/Dekalb license



# Questions/Comments?



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