

Managing glyphosate-resistant Palmer amaranth in conventional and strip-till cotton



Culpepper, York, MacRae, Whitaker



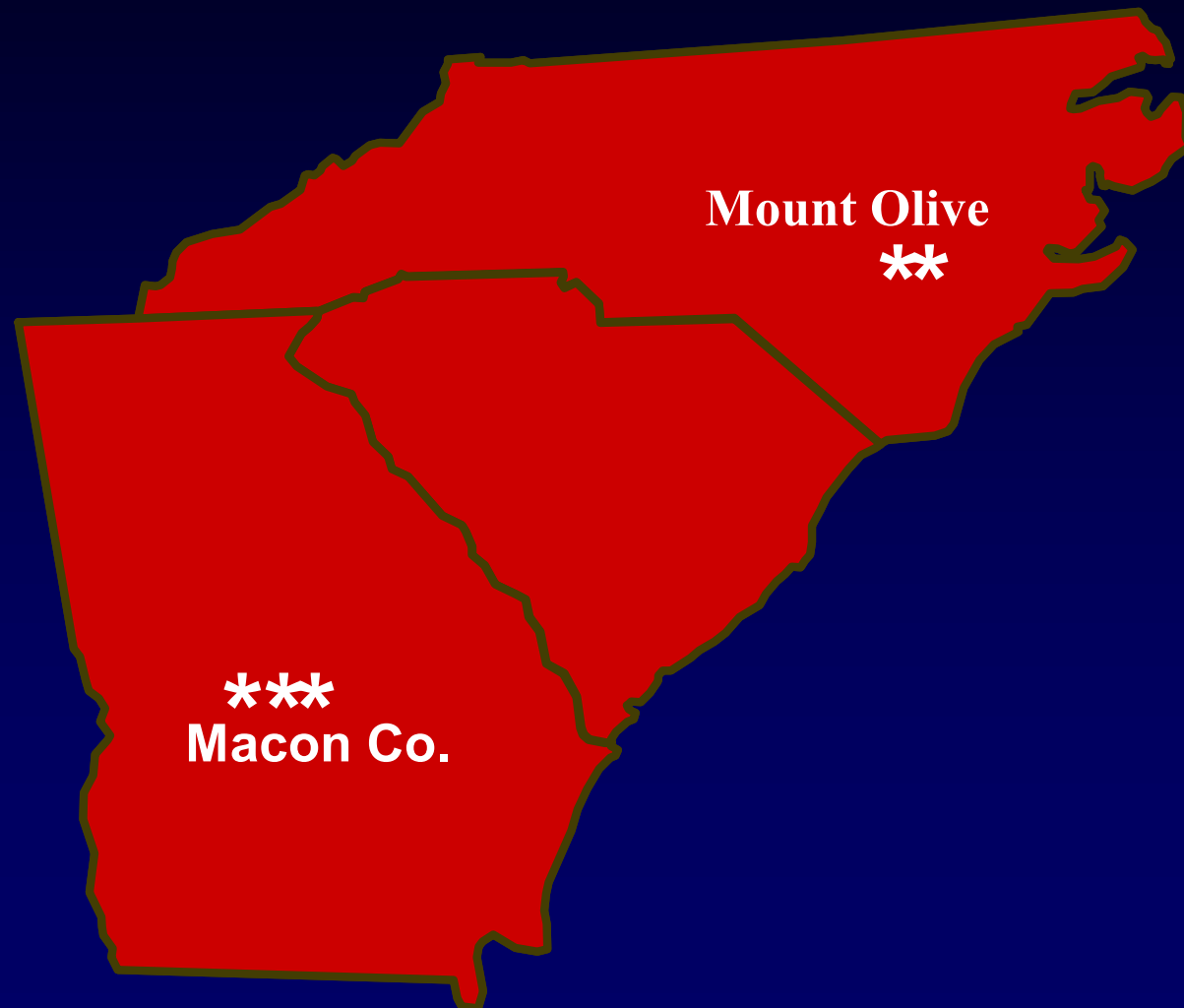
Conservation Tillage is Very Important To the Southeast



Objective

- Determine the impacts of conservation tillage on the management of glyphosate-resistant Palmer amaranth.

Experiment 1: 2006 and 2007 Locations



Materials and Methods

Plot size

GA = 4 rows by 35-45 feet

NC = 4 rows by 25-30 feet

Split Plot/Factorial Design

7 herbicide systems

2 tillage practices

Herbicide Systems*

PRE	POST
Prowl	Roundup + Dual Mag.
Prowl + Cotoran	
Prowl + Staple	
Prowl + Reflex	
Prowl	Roundup + Staple
Prowl + Cotoran	
Prowl + Reflex	

*Direx + MSMA applied at layby for each herbicide program.

Herbicides and Rates

PRE

Prowl H20	2.5 pt/A
Cotoran	2 pt/A
Staple LX	1.7 fl oz
Reflex	1 pt/A

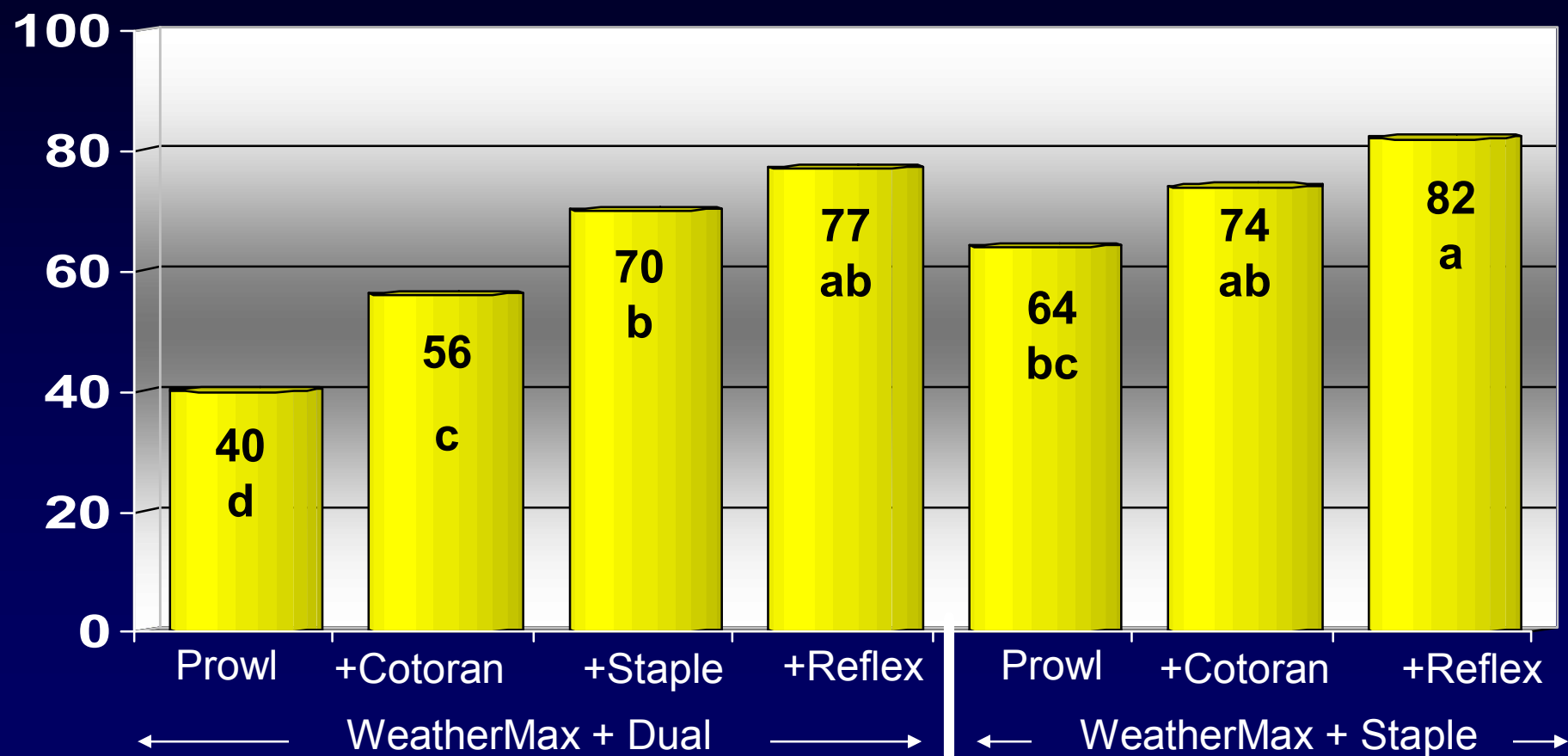
POST

WeatherMax	22 oz/A
Dual Mag.	1 pt
Staple LX	1.7 fl oz

Layby

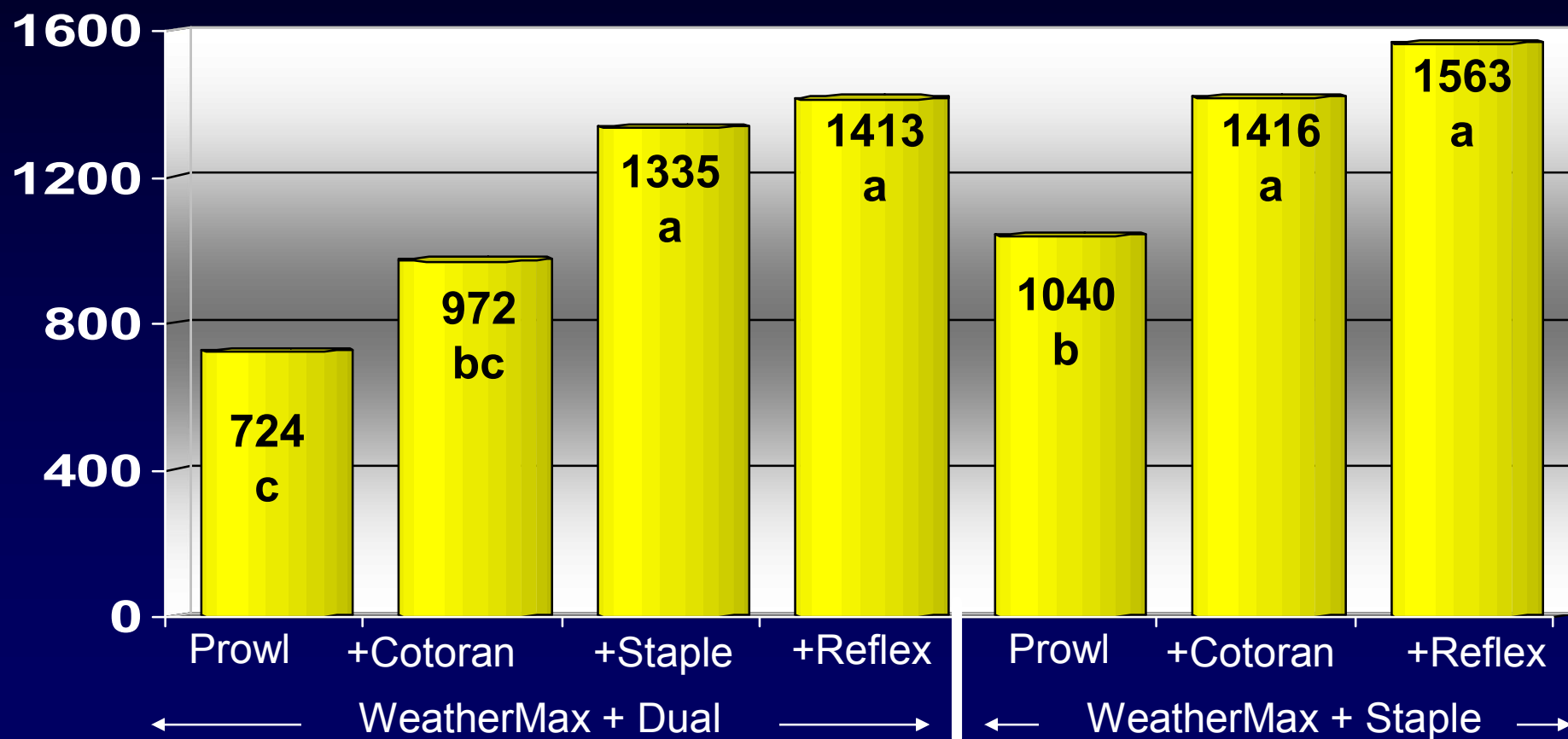
Direx 2 pt + MSMA 2 lb

Percent glyphosate-resistant Palmer amaranth control at harvest. Five locations, GA & NC.*



Direx + MSMA directed over entire trial area.

Seed Cotton Yield. Five locations, GA & NC.*



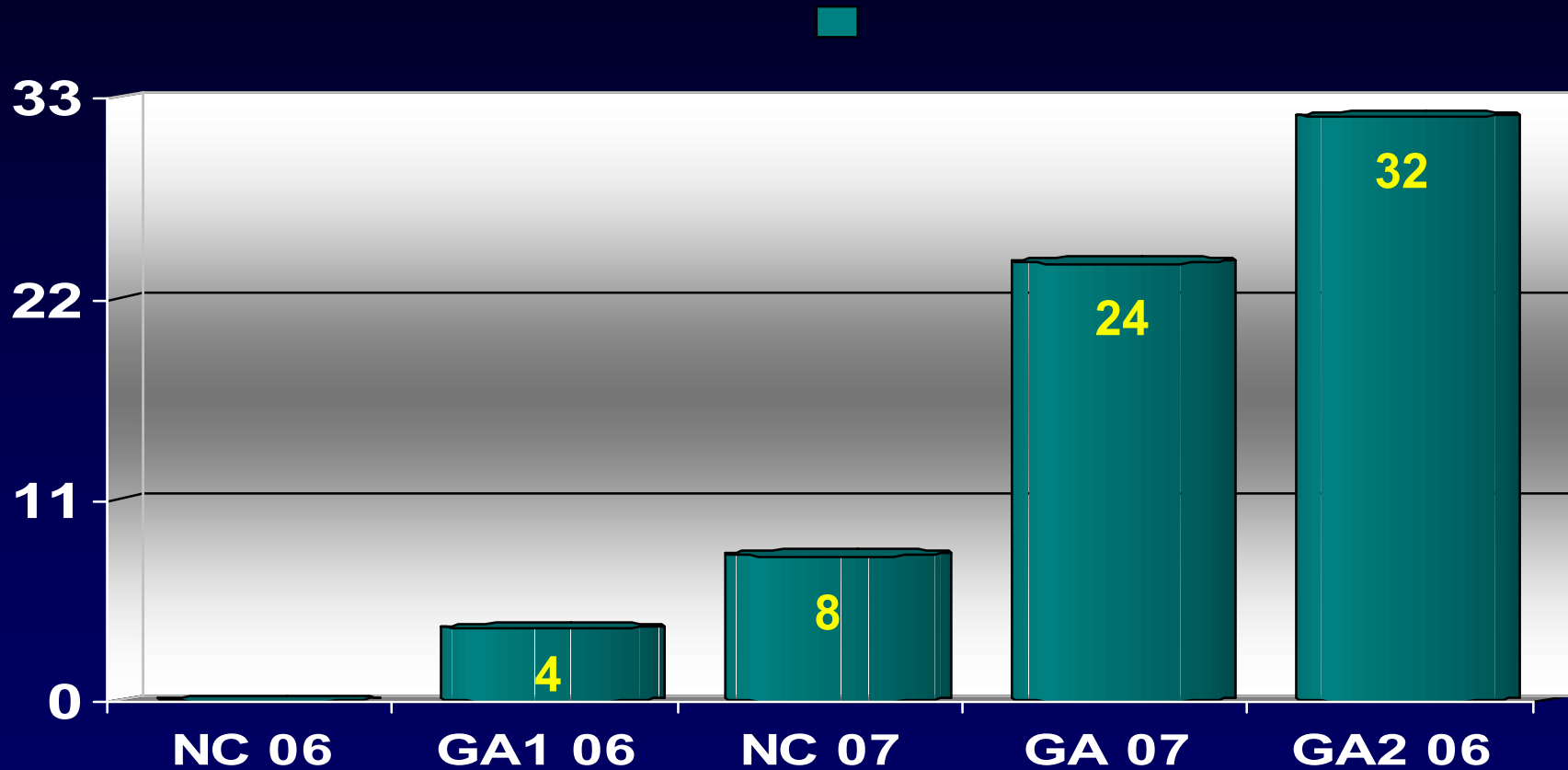
Direx + MSMA directed over entire trial area.

Tillage Systems

Conventional: no weeds or residue

Strip Tillage: cover controlled
several weeks ahead of planting
followed by Gramoxone PRE

Wheat height (inches) at time of burndown.*

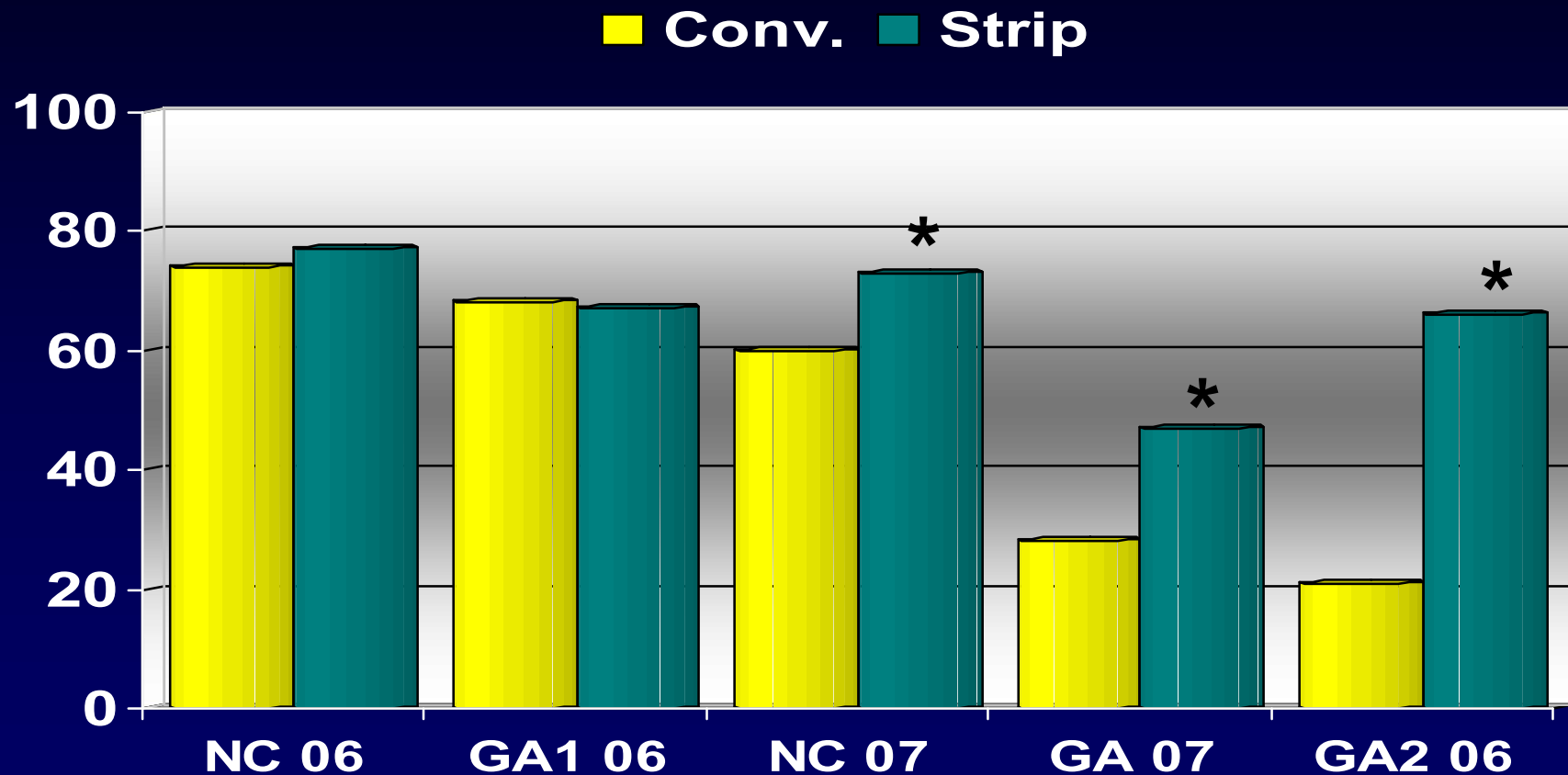




Residue= 9760 lb/A

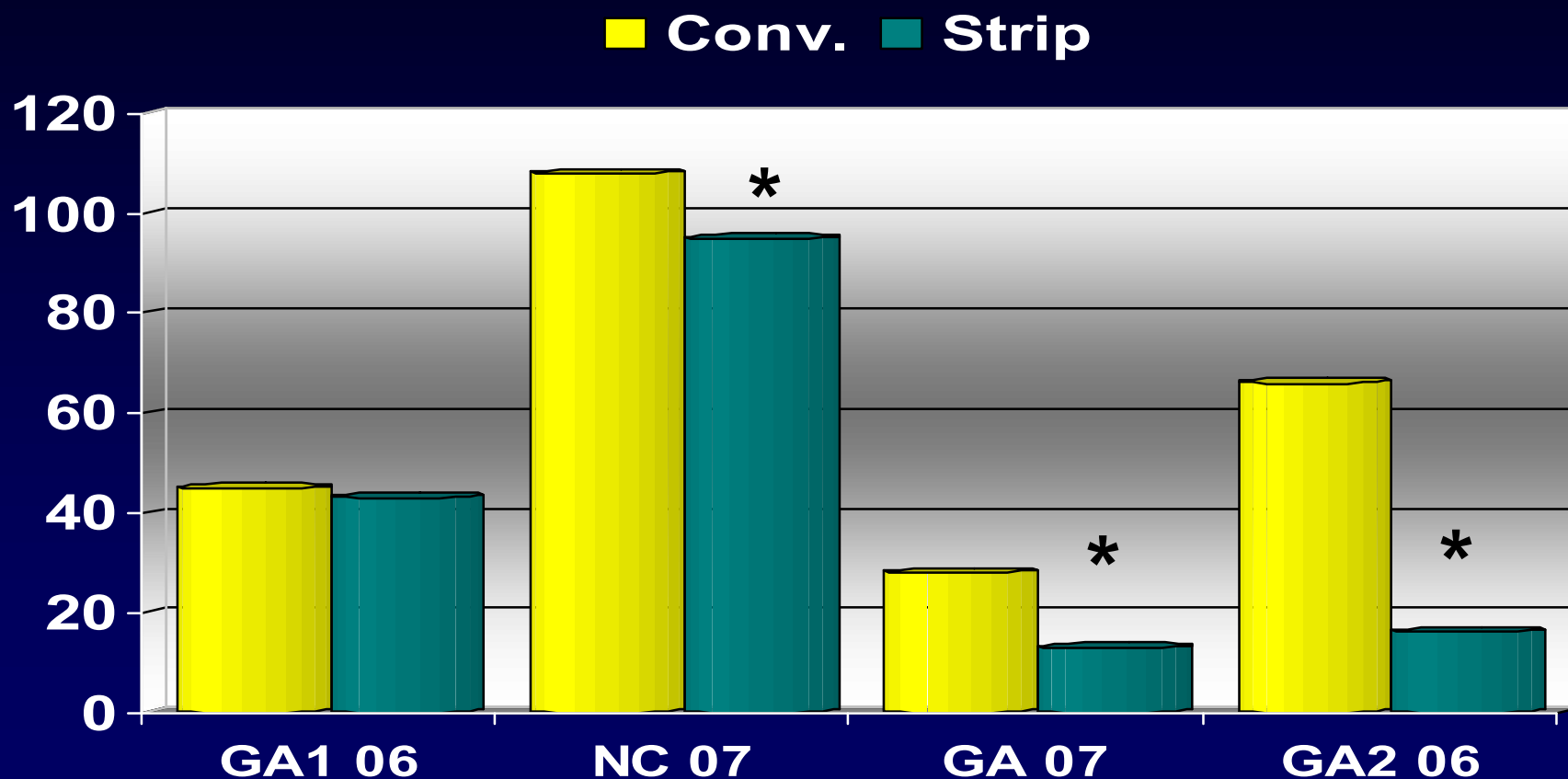


Percent glyphosate-resistant Palmer amaranth control at harvest. Tillage main effects.*



*An asterisk denotes control greater in strip-till production.

Number of Palmer amaranth (sq yd) infesting the non-treated control 21 to 28 DAP.



*An asterisk denotes less pigweed in strip-till production.

Prowl + Cotoran PRE fb Roundup + Staple



**Prowl + Cotoran PRE fb Roundup + Dual 4 inch fb
Direx + MSMA PD**



Conv



Strip-Till

**Prowl + Reflex PRE fb Roundup + Dual 4 inch fb
Direx + MSMA PD**

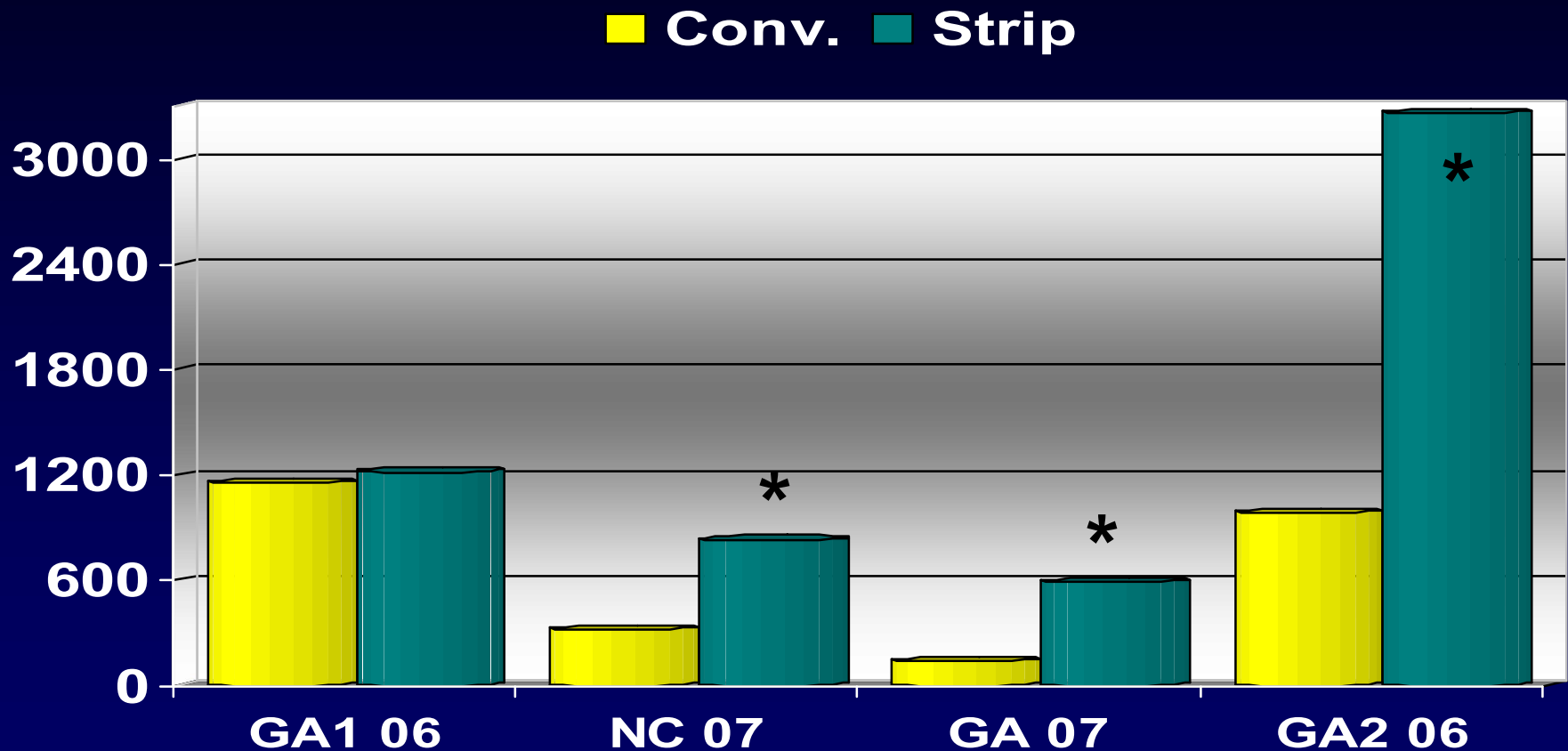


Conv



Strip-Till

Seed Cotton Yield as Impacted by Tillage. Georgia and North Carolina. 2006-2007.



*An asterisk denotes significantly higher yields in strip-till production.

Conclusions Experiment 1

1. Heavy residue improved control.
 - A. Reduced pigweed emergence
 - B. Slowed pigweed emergence and growth
2. Heavy residue would likely benefit areas not infested with resistance by reducing selection pressure.

Conclusions Experiment 1

3. Heavy residue would likely put more selection pressure on ALS chemistry (Staple) controlling those plants escaping residual herbicides.

Experiment 2: Materials and Methods

Herbicide systems (1st rainfall 17 DAP)

None or

Prowl + Reflex, RU + Staple, Direx + MSMA

Cover crop options

rye controlled 2 or 4 wk before planting

wheat controlled 2 or 4 wk before planting

no cover

Materials and Methods

Liter Produced (at planting)

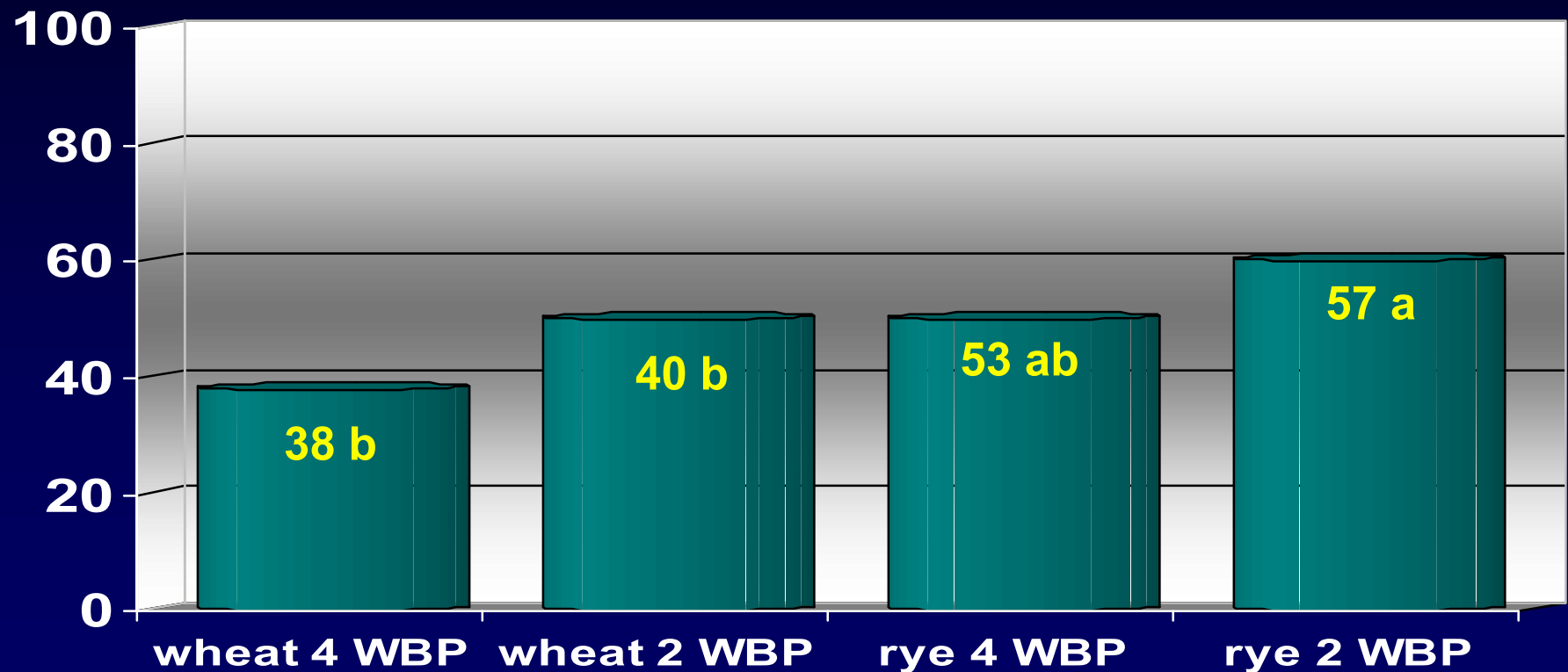
wheat 4 WBP (knee high): 59,895 lb/A of liter

wheat 2 WBP (waist high): 66,429 lb/A of liter

rye 4 WBP (waist high): 68,607 lb/A of liter

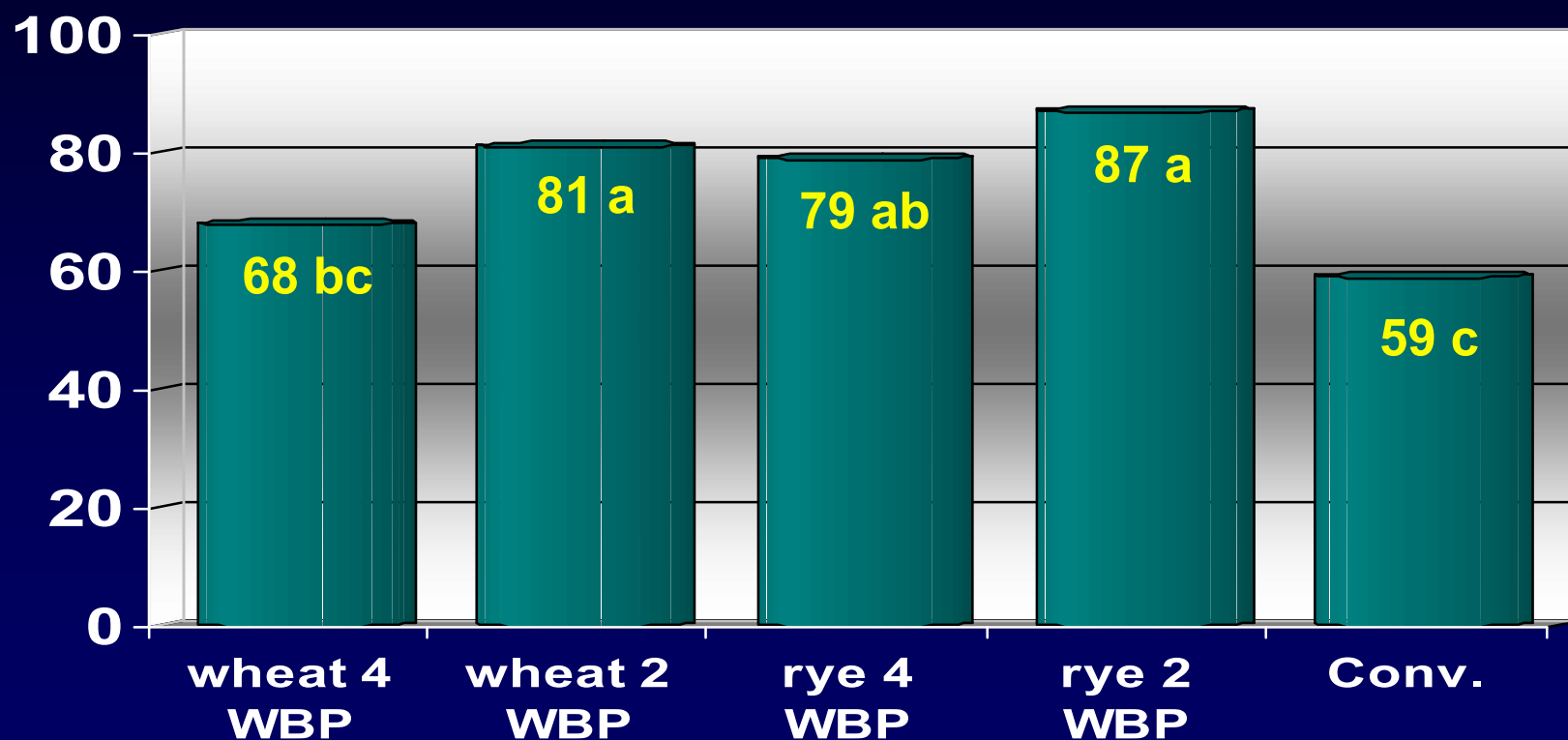
rye 2 WBP (head high): 96,921 lb/A of liter

Percent reduction in Palmer emergence by cover crops without herbicides. 42 DAP.*



*Compared to the no cover conventionally tilled system.

Percent Palmer amaranth control at harvest with herbicide programs. Macon County, GA. 2007.





Conventional tillage

Prowl + Reflex PRE

RU + Staple POST

Direx + MSMA layby

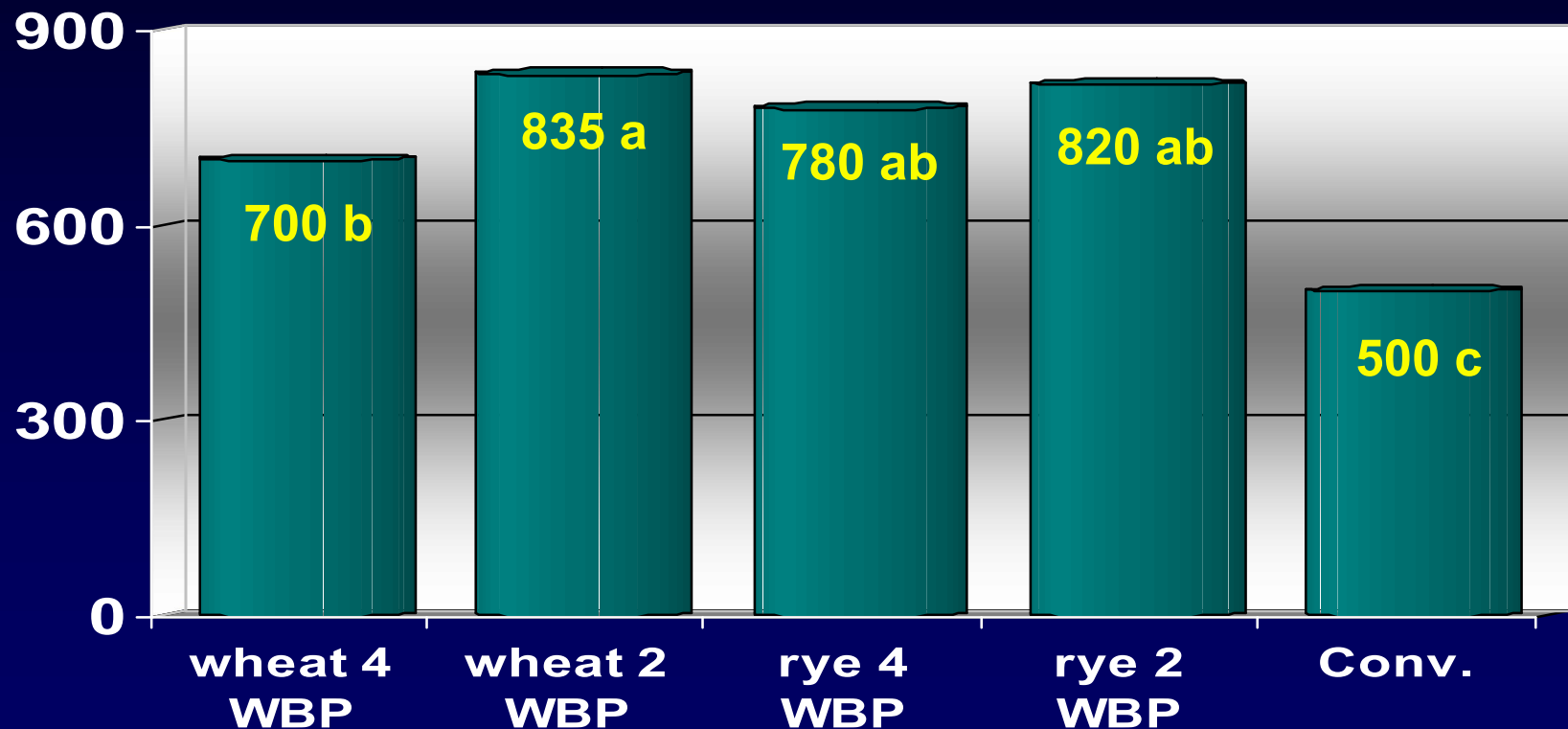


Knee high wheat
Prowl + Reflex PRE
RU + Staple POST
Direx + MSMA layby



Waist high wheat
Prowl + Reflex PRE
RU + Staple POST
Direx + MSMA layby

Cotton yield as impacted by cover crop residue. Macon County, GA . 2007.*





Conclusions Experiment 2

1. Heavy residue improved control.
 - A. Reduced pigweed emergence
 - B. Slowed pigweed emergence and growth
2. Heavy residue would likely put more selection pressure on ALS chemistry (Staple) controlling those plants escaping residual herbicides.

Palmer amaranth infests strip till cotton.



Comments

