

2014 Beltwide: Time of Day Influence on Control of Palmer Amaranth by Dicamba Tank Mixes



Culpepper, Eure, Grey, Fowler

Managing Off-Target Movement



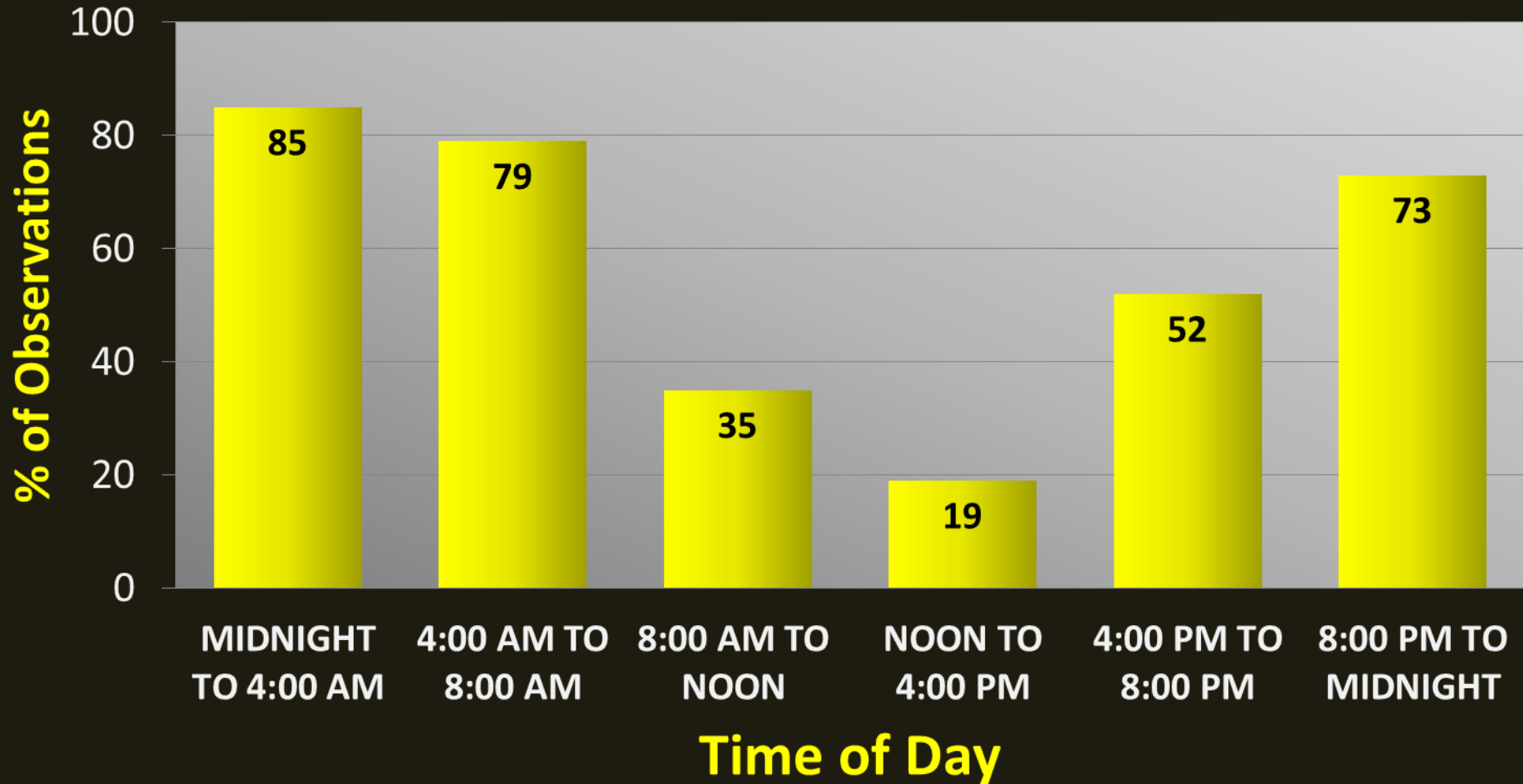
2012 Georgia Fruit and Vegetables

- **Approximately 200,000 acres**
- **45 different crops**
- **3rd in U.S. vegetable production acres**
- **Farm Gate Value: \$1,200,000,000**



Percentage of Time Wind is < 10 MPH

May 1 – June 30, 2012*



*Based on the maximum wind speed recorded every 15 minutes throughout each day. Data collected by the Georgia Weather Network.



Liberty Treatments (32 oz/A)

Study 1: Morning

1 hr before sunrise

½ hr before sunrise

At sunrise

½ hr after sunrise

1 hr after sunrise

2 hr after sunrise

4 hr after sunrise

6 hr after sunrise

Study 2: Evening

6 hr before sunset

4 hr before sunset

2 hr before sunset

1 hr before sunset

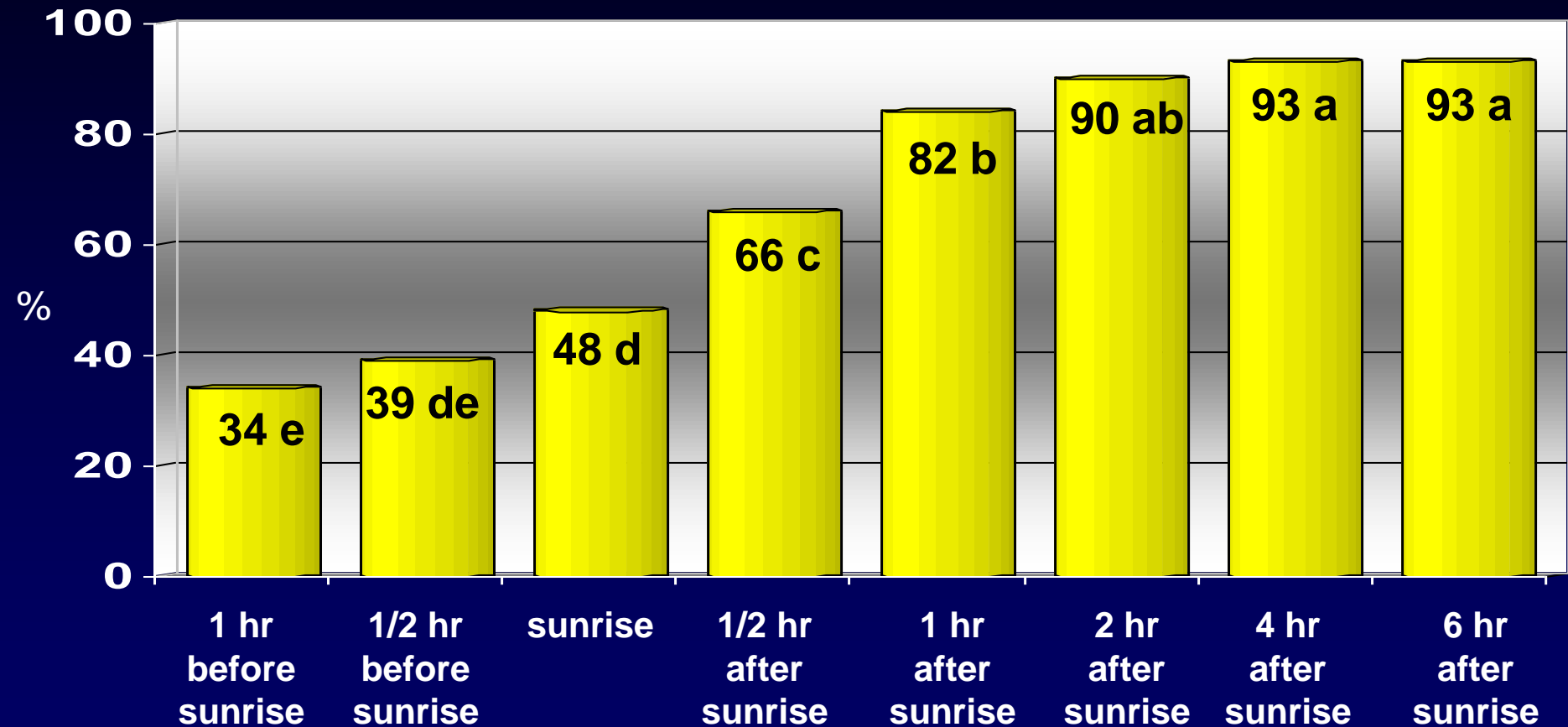
½ hr before sunset

At sunset

½ hr after sunset

1 hr after sunset

Palmer Control by Liberty System as Influenced by Time of Day. Late-Season in GA, LA, MS, NC, TN.



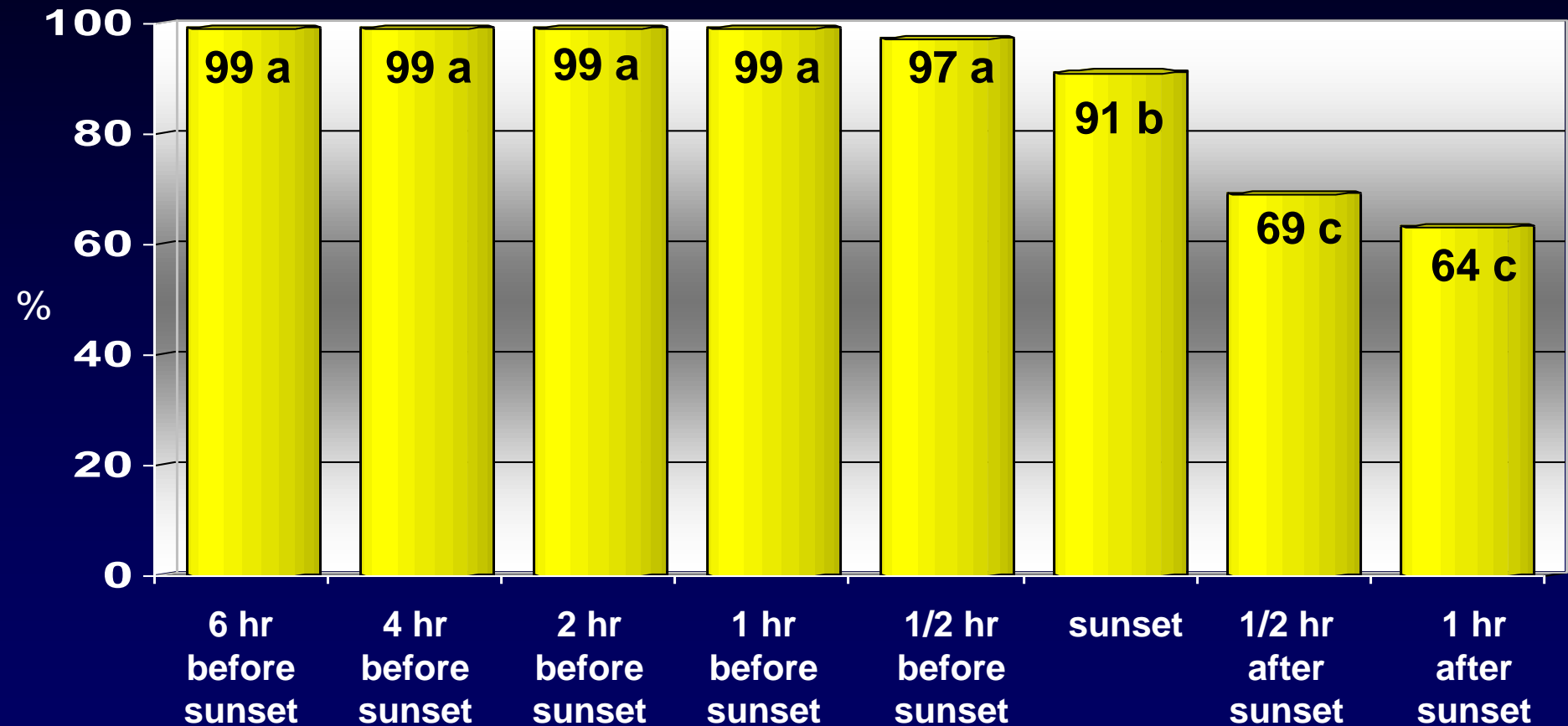
Time of Day Liberty was Applied

*Liberty POST 1 (5" Palmer), Liberty POST 2 (15 d later), Diuron + MSMA layby

Liberty Application Time of Day; Morning Application; GA



Palmer Control by Liberty as Influenced by Time of Day. Late-Season in GA and NC.



Time of Day Liberty was Applied

*Liberty POST 1 (5" Palmer), Liberty POST 2 (18 d later), Diuron + MSMA layby

Liberty Application Time of Day; Evening Application; NC 2012

2 weeks after second POST application



2 hr before sunset



1 hr before sunset



1/2 hr before sunset



1 hr after sunset

Time of Day Influence on 2,4-D

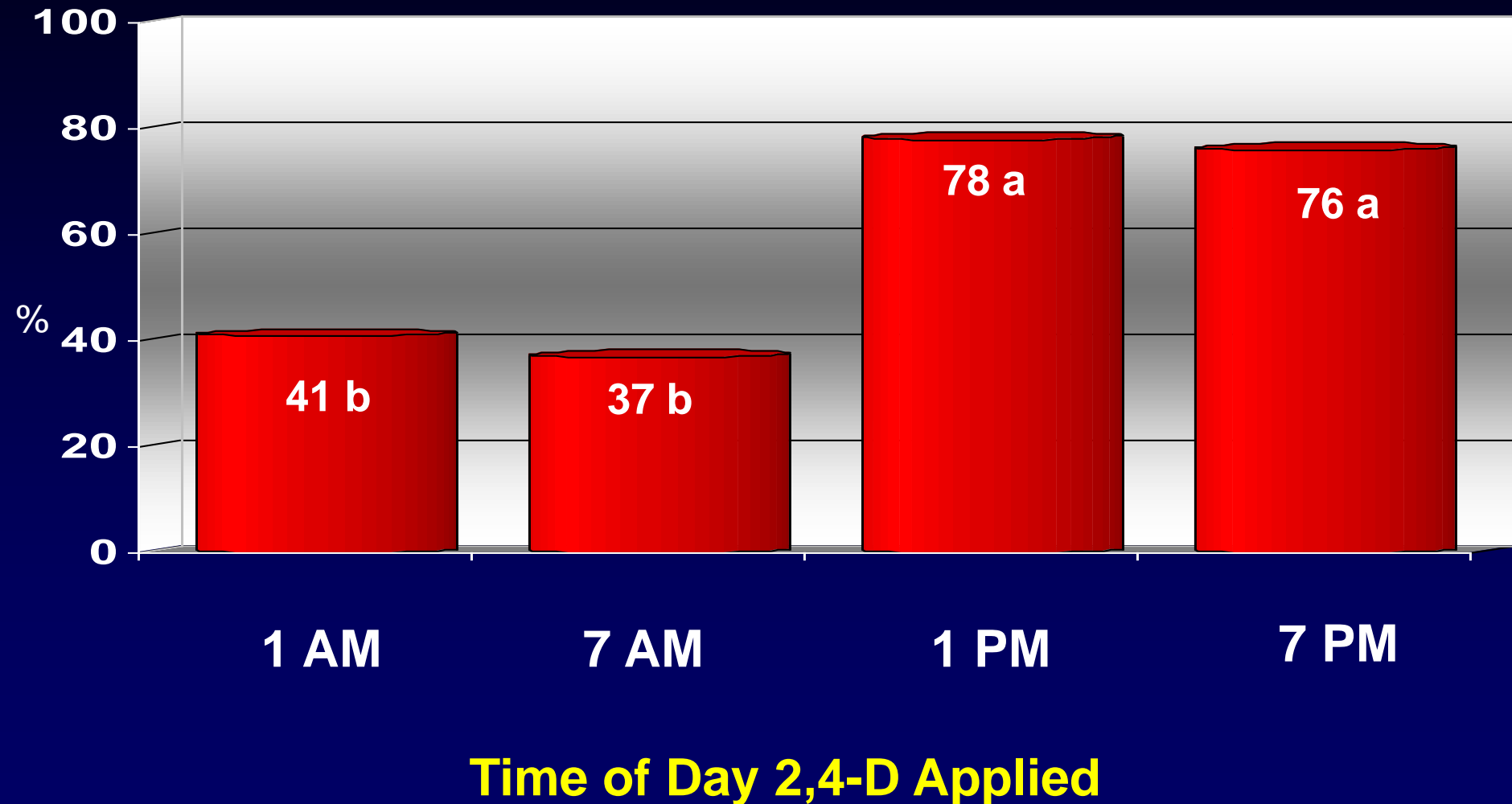


Treatments

| Herbicides | Time |
|-----------------|------|
| 2,4-D | 1 AM |
| RU + 2,4-D | 7 AM |
| Liberty | 1 PM |
| Liberty + 2,4-D | 7 PM |

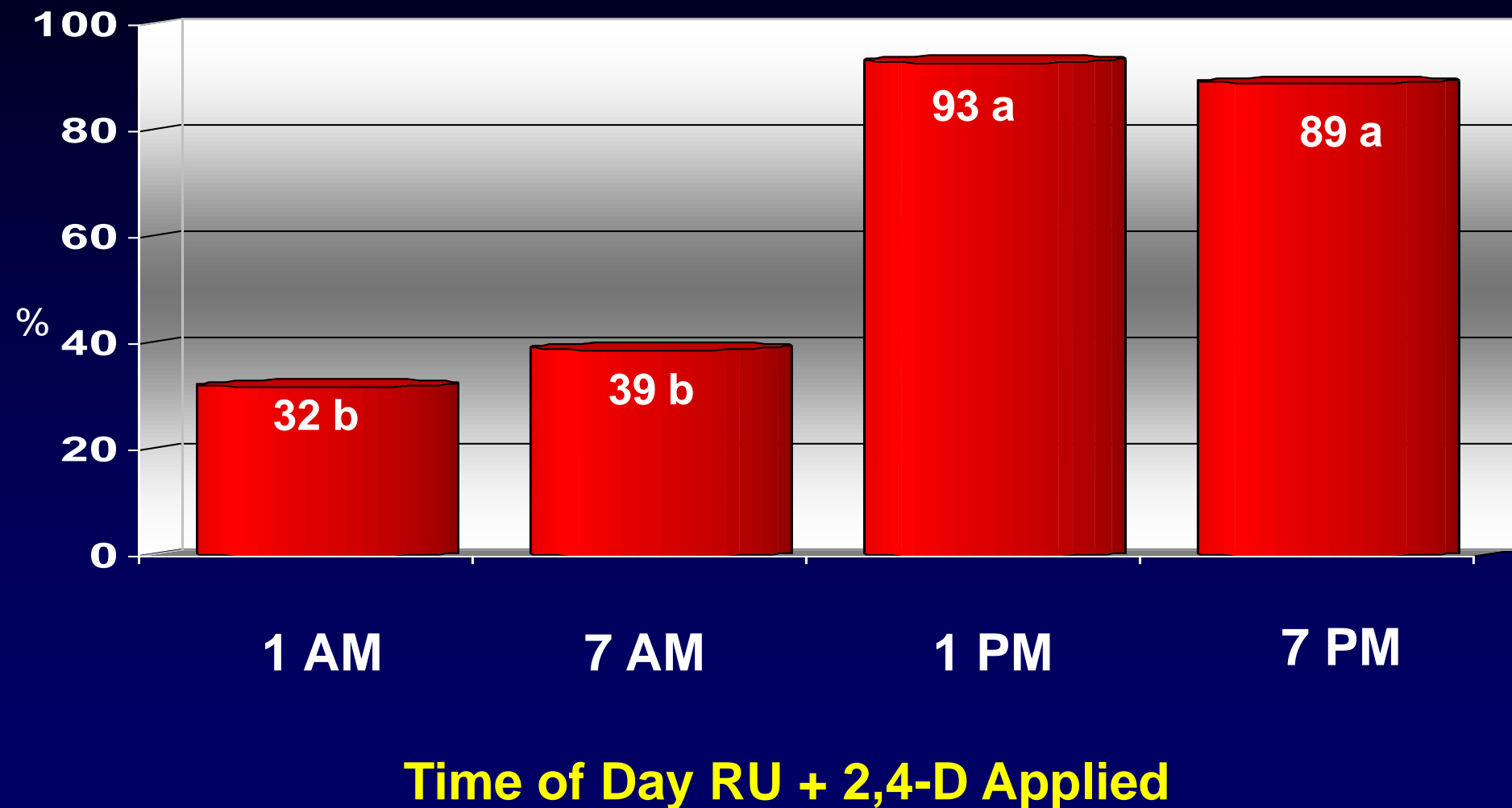
2,4-D 1 qt/A; Roundup Wmax 1 qt/A; Liberty 29 oz/A

Palmer Control by 2,4-D Systems. Macon County, 2011 and 2012.



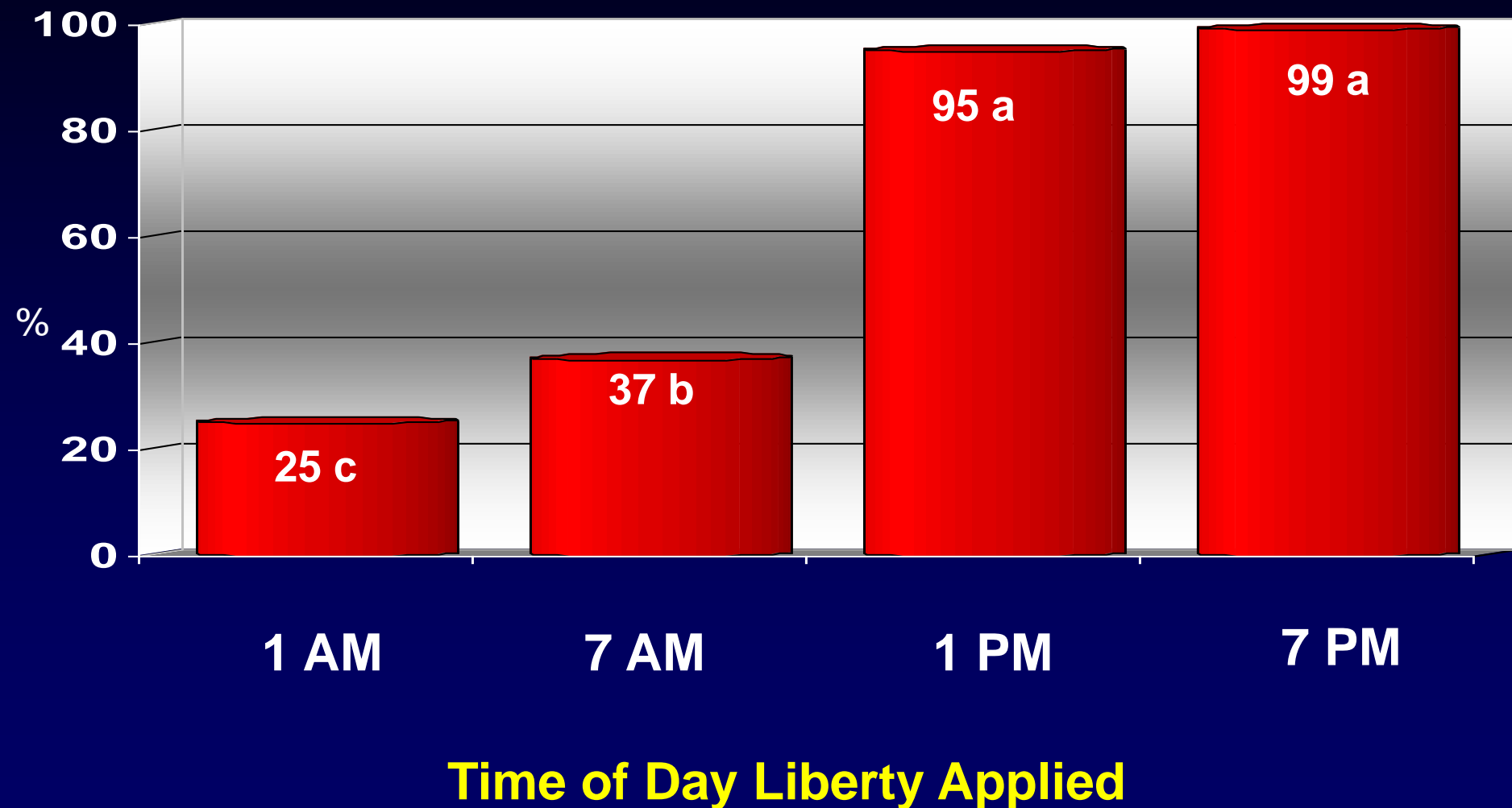
POST 1 (5-8" Palmer), POST 2 (15 d later), Diuron + MSMA layby

Palmer Control by RU + 2,4-D Systems. Macon County, 2011 and 2012.



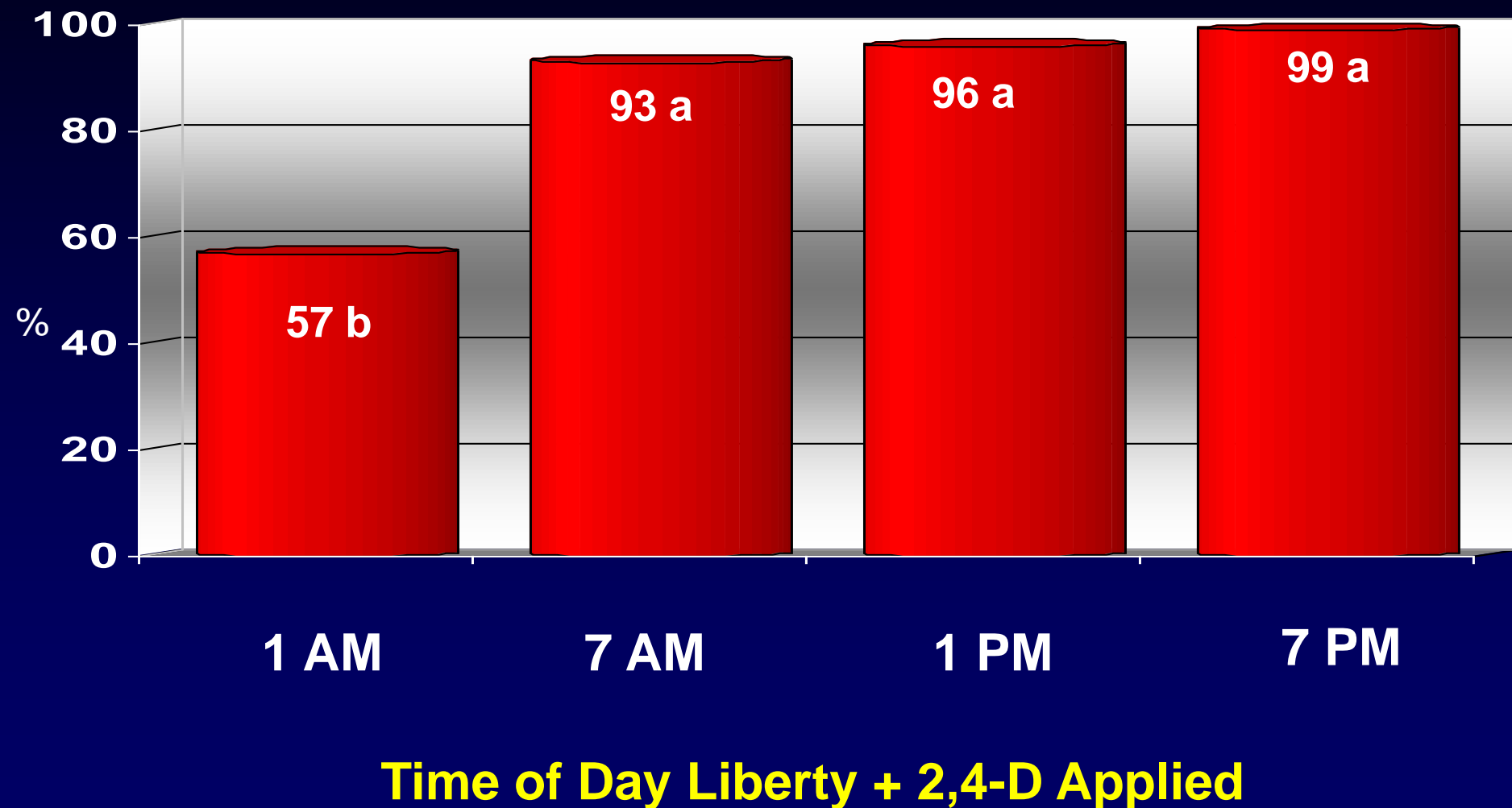
POST 1 (5-8" Palmer), POST 2 (15 d later), Diuron + MSMA layby

Palmer Control by Liberty Systems. Macon County, 2011 and 2012.



POST 1 (5-8" Palmer), POST 2 (15 d later), Diuron + MSMA layby

Palmer Control by Liberty + 2,4-D Systems. Macon County, 2011 and 2012.



POST 1 (5-8" Palmer), POST 2 (15 d later), Diuron + MSMA layby

GR Palmer Control



**2,4-D w/ glyphosate fb
2,4-D w/ glyphosate
7 AM**



**2,4-D w/ glyphosate fb
2,4-D w/ glyphosate
1 PM**

GR Palmer Control



**2,4-D w/ glufosinate fb
2,4-D w/ glufosinate
7 AM**



**2,4-D w/ glufosinate fb
2,4-D w/ glufosinate
1 PM**

Palmer Response to Dicamba

Herbicides

Time

Clarity + Roundup

5 AM

Clarity + Liberty

6:30 AM

8 AM

9:30 AM

11 AM

Clarity 12 oz; Roundup WMAX 32 oz, Liberty 32 oz

Palmer Response to Dicamba

Herbicides

Time

Clarity + Roundup

5 AM

Clarity + Liberty

6:30 AM

8 AM

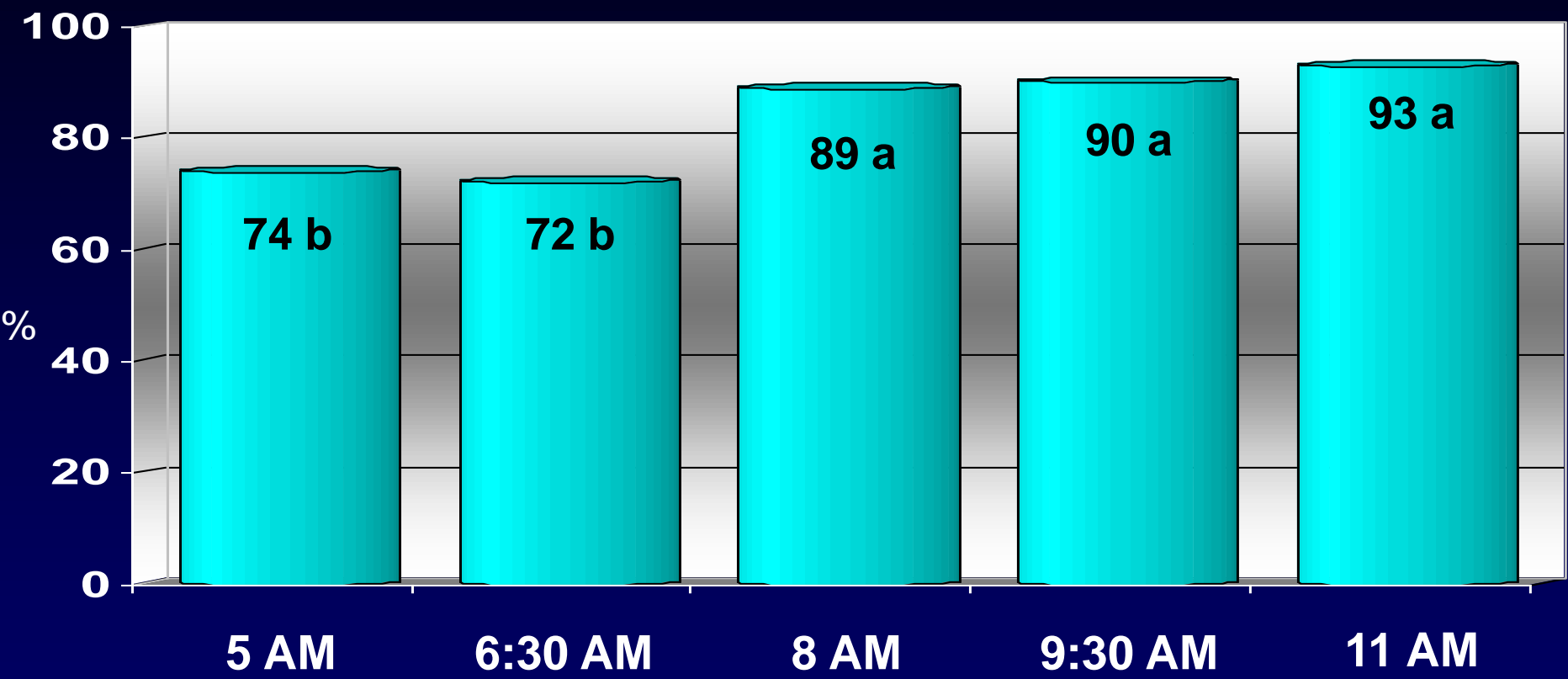
Liberty and WMAX
at 5 and 11 AM

9:30 AM

11 AM

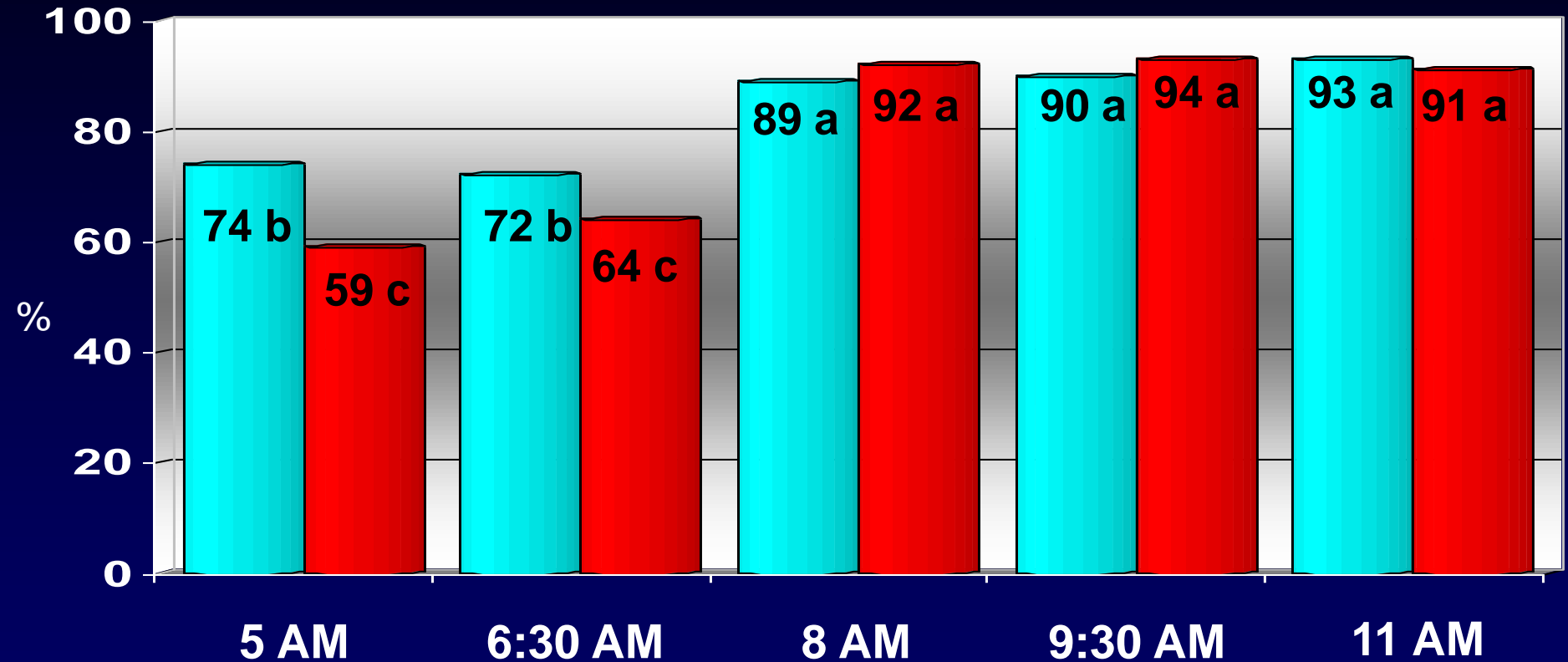
Clarity 12 oz; Roundup WMAX 32 oz, Liberty 32 oz

Palmer Control by Dicamba Mixes as Influenced by Time of Day. Macon 2013. 20 DAT.



Time of Day RU + Clarity Applied

Palmer Control by Dicamba Mixes as Influenced by Time of Day. Macon 2013. 20 DAT.



Time of Day RU + Clarity or Liberty + Clarity Applied

Roundup + Clarity



5:00 AM

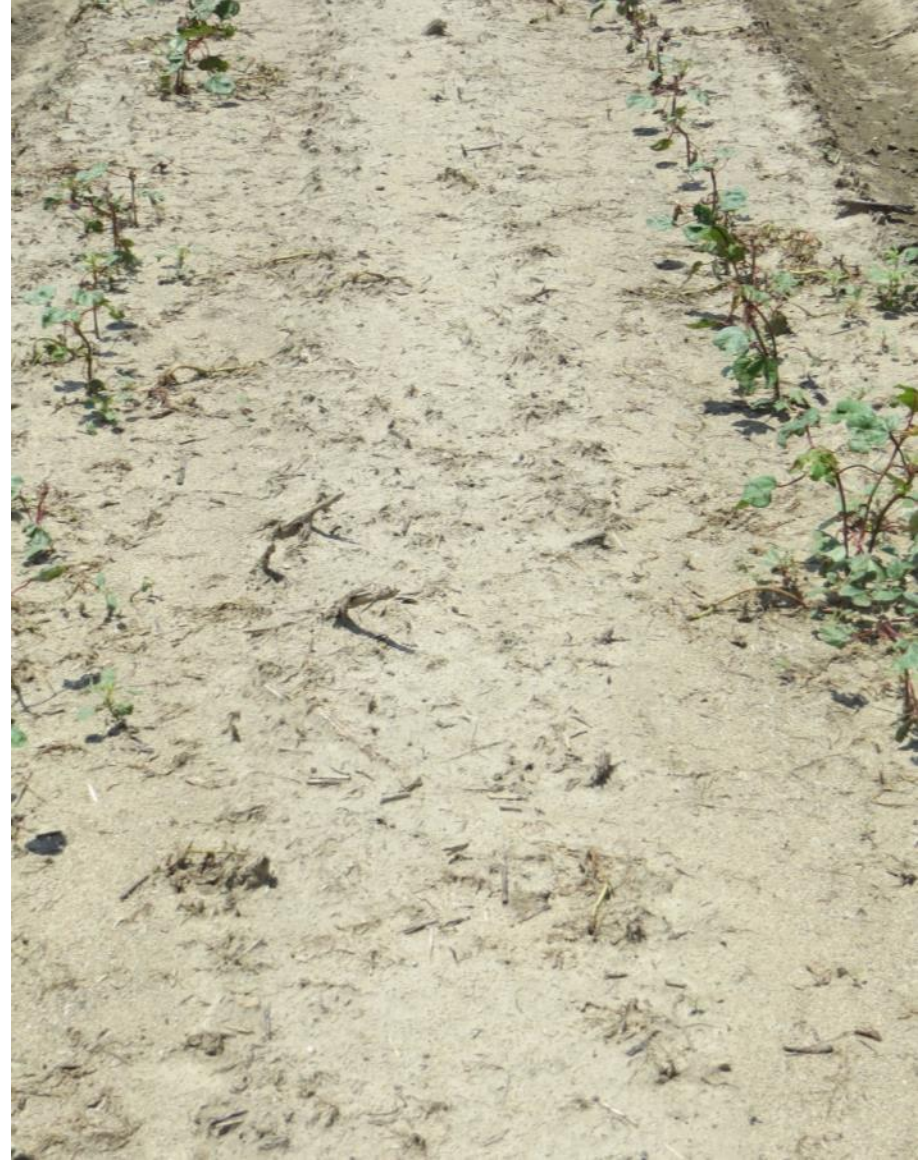


6:30 AM

Roundup + Clarity

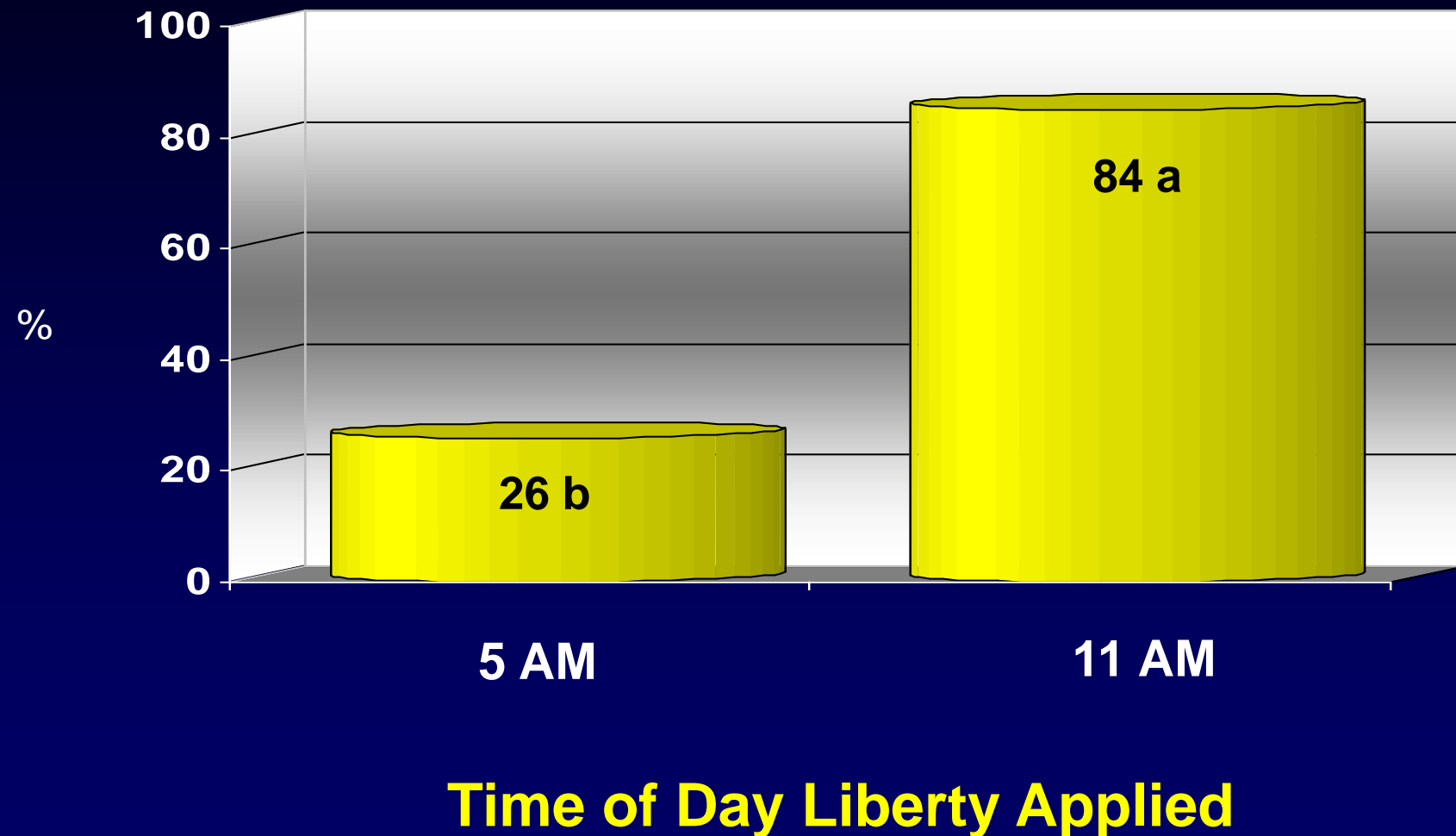


8:00 AM



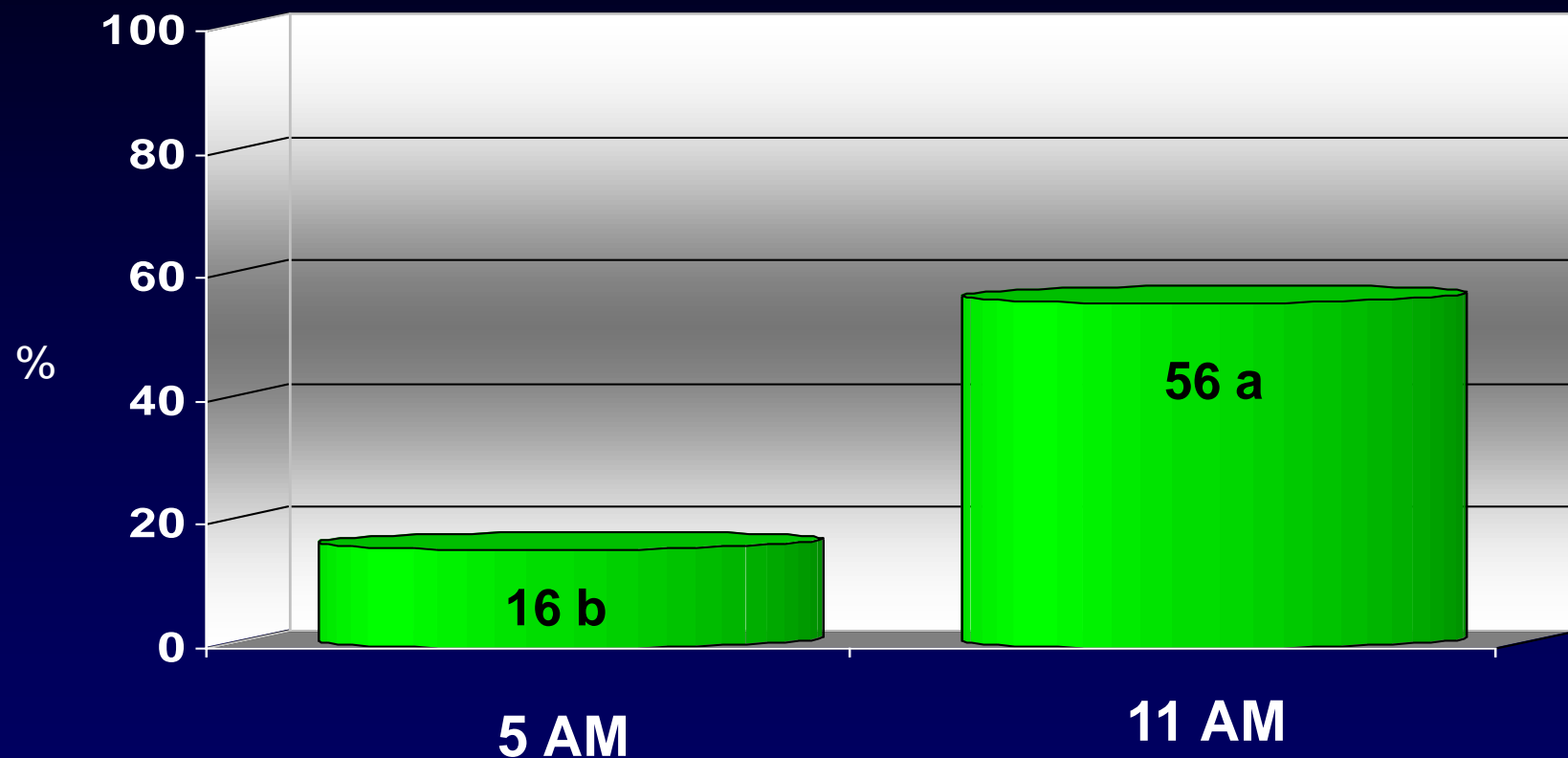
9:30 AM

Palmer Control by Liberty as Influenced by Time of Day. Macon 2013. 20 DAT.



Time of Day Liberty Applied

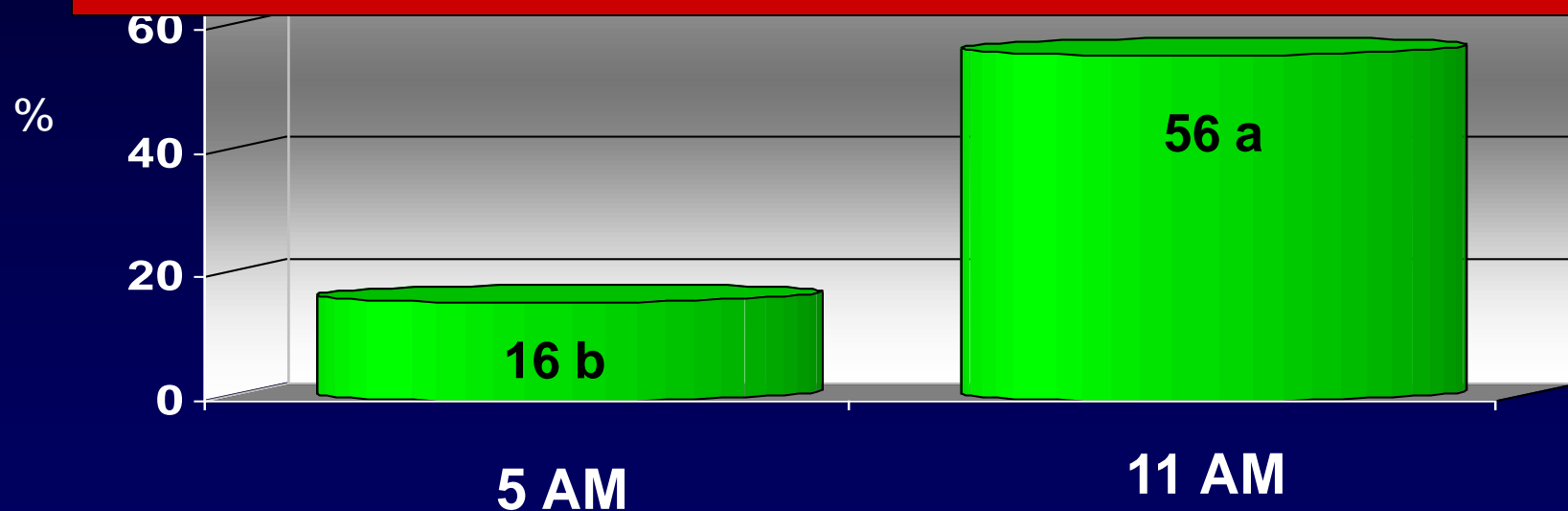
Palmer Control by Roundup as Influenced by Time of Day. Macon 2013. 20 DAT.



Time of Day Roundup Applied

Palmer Control by Roundup as Influenced by Time of Day. Macon 2013. 20 DAT.

HIGHLY RESISTANT POPULATION

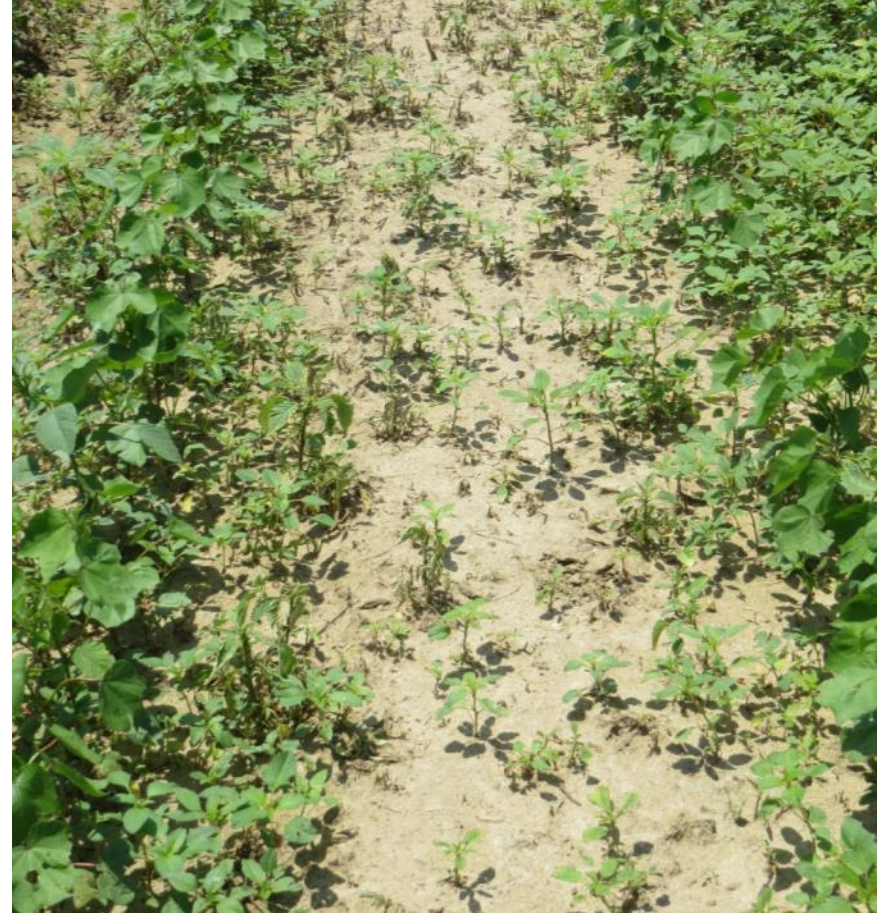


Time of Day Roundup Applied

Roundup WeatherMax



8 AM



11 AM

Environmental Conditions Measured

- **Humidity**
- **Temperature (air and soil)**
- **Moon**
- **Sunlight**
- **Clouds**
- **Leaf orientation**
- **Dew (herbicide drip)**
- **Soil moisture**

Leaf Closure Prior to Sunrise





^{14}C Cooperative Efforts:

Bayer : glufosinate

Dow : 2,4-D

Monsanto: dicamba
(results late Jan)



Questions/Comments

