FMC®

The Journey Forward

Command – Rice Fit in a Clearfield System

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FMC
Agricultural Products Group

Objective

- Command Use
- Command Label Update
- Weed Resistance Management--Rice
- Command Usage in a Clearfield Program

Command 3ME :Rice

- **Preemergence**
- **Early postemergence**
- **Combinations**

Command: The Foundation for all Rice Weed Control Programs

PRODUCT ATTRIBUTES	BENEFITS
Effective Weed Control	**Excellent control of difficult to manage grasses such as barnyard grass, broadleaf signal grass, crabgrass and sprangletop for higher rice yields.**
Flexible Application	**Apply Command 3ME Pre-plant surface, Pre-emergence or Early Post-emergence (up to 2 leaf rice) regardless of tillage system.**
Residual Control	**Command 3ME provides an excellent residual base in front of Clearfield Rice, reducing early season weed competition allowing for maximum yields.**
Resistance Management	**Command 3ME provides a unique mode of action and residual control of many grasses that are becoming more difficult to control or resistant to other herbicides.**

Command / Aim Weed Control Use Patterns In Rice

Weeds	Command	Aim	Command Aim	Command Aim/Propanil	Command Aim/Permit	NewPath fb NewPath
Morninglories	3	9	9	9	9	6
Hemp sesbania	0	9	9	9	9	0
Jointvetch	0	9	9	9	9	0
Cocklebur	4	8	8	9	8	9
Texas Weed	0	8	8	9	8	
Redweed	0	9	9	9	9	
Purslane	3	9	9	9	9	
PA Smartweed	4	8	8	8	8	9
Waterhys spp.	0	9	9	9	9	0
Dayflower	5	7	8	8	8	5
Duck salad	0	5	5	7	5	7
Eclipta	3	7	7	9	7	0
Redstem	0	5	5	8	5	8
Rice Flat Sedge	0	5	5	9	8	9
Nutsedge	0	3	3	5	9	8
Barnyardgrass	9	0	9	9	9	9
BL Signal Grass	9	0	9	9	9	9
Sprangletop	9	0	9	9	9	7
Crabgrass	9	0	9	9	9	9
Fall Panicum	9	0	9	9	9	9
Alligator Weed	0	5	5	5	5	

80% > Control 50% to 70% Control No Control

Objective

- **Command Use**
- **Command Label Update**
- **Weed Resistance Management--Rice**
- **Command Usage in a Clearfield Program**

Section 24© Aerial Label- 2009

- LA
- MS
- AR
- MO
- TX

Command Aerial 24c Label

RATE OF APPLICATION			
Soil Texture	Broadcast Rates Per Acre*	Pounds active Ingredient per acre	Acres per Gallon
Coarse (light) Soils: (sand,loamy sand, sandy loam):	0.67-0.8 pts (10.7 - 12.8 fl oz)	0.25 - 0.3	12.0 - 10.0
Medium Soils: (loam, silt, silt loam, sandy clay, sandy clay loam)	1.1 pts (17.1 fl oz)	0.4	7.5
Fine (heavy) Soils: (silty clay, clay loam, silty clay loam, clay)	1.33 - 1.6 pts (21.3 - 25.6 fl oz)	0.5 - 0.6	6 - 5
* Select lower to higher rates based on lighter to heavier soil types.			

Section 24© Label- 2009

RESTRICTIONS:

Command 3ME may be applied to water seeded rice 14 days prior to planting or during rice pegging up to re-flooding but prior to grass emergence.

With split applications do not apply more than a total of 1.6 pt/A Command 3ME (0.6 lbs ai/A) per season.

Do not apply Command 3ME herbicide on rice fields in which concurrent crayfish or catfish farming is included in the cultural practices.

Do not use water containing Command 3ME residues from rice cultivation to irrigate food or feed crops, which are not registered for use with Command 3ME

SPLIT APPLICATIONS

Both pre-emergent surface broadcast applications and early post-emergence applications (out to the two leaf stage) of Command 3ME may be made during the same season to control the above weeds as long as the total seasonal application does not exceed 0.6 lb ai/A. Refer to the table below for specific rates.

Command 3ME Herbicide Applied as Split Applications

Soil Texture	Pre-Emergent Application Broadcast Rates Per Acre	Post-Emergent Application Broadcast Rates Per Acre
Coarse (light) Soils: (sand, loamy sand, sandy loam)	2/3 pint (0.25 lb. ai)	2/3 pint (0.25 lb. ai)
Medium Soils: (loam, silt, silt loam, sandy clay, sandy clay loam)	4/5 to 7/8 pints (0.3 – 0.35 lb. ai)	2/3 to 4/5 pints (0.25 – 0.3 lb ai)
Fine (heavy) Soils: (silty clay, clay loam, silty clay loam, clay)	1 1/8 to 1 1/3 pints (0.4 to 0.5 lb. ai)	1/32 to 1/16 pints (0.1 to 0.2 lb. ai)

Proposed new section would be expanded to allow for higher rates

2008 Data Summary –
Early and late season weed control data in Rice, Tillar, AR*

Treatment	Rate (lb ai/A)	Timing	% Control ECHCG (14 DAT)	% Control ECHCG (58 DAT)
1. Command 3 ME	0.3	Pre	83 abc	75 d
2. Command 3 ME	0.4	Pre	84 ab	76 cd
3. Command 3 ME	0.6	Pre	93 ab	91 ab
4. Command 3 ME	0.3/ 0.3	Pre/ 2leaf	79 bc	90 ab
5. Command 3 ME	0.4/ 0.4	Pre/ 2leaf	100 a	96 a
6. Command 3 ME	0.3	Pre/ 2leaf	100 a	96 a
+ Facet 75 WG	0.3	2 leaf		
7.Untreated	0	-	0 e	0 e

* ECHCG = Common barnyardgrass. Weed control rating made on June 14 (14DAT) and Aug 1 (58 DAT). DAT = days after final application of post sprays.

2008 Data Summary – Location # 1
Weed control data of several grasses in Rice, Stuttgart, AR*

Treatment	Rate (lb ai/A)	Timing	% Control ECHCG (15 DAT)	% Control DIGSS (15 DAT)	% Control LEFSS (15 DAT)
1. Command 3 ME	0.3	Pre	75 b	90 a	78 b
2. Command 3 ME	0.4	Pre	79 ab	93 a	81 ab
3. Command 3 ME	0.6	Pre	85 ab	95 a	90 a
4. Command 3 ME	0.3/ 0.3	Pre/ 2leaf	83 ab	93 a	89 a
5. Command 3 ME	0.4/ 0.4	Pre/ 2leaf	90 a	95 a	86 ab
6. Command 3 ME	0.3	Pre/ 2leaf	90 a	94 a	84 ab
+ Facet 75 WG	0.3	2 leaf			
7.Untreated	0	-	0 d	0 d	0 c

* ECHCG = Common barnyardgrass, DIGSS = Crabgrass, LEFSS = Sprangletop. Weed control rating made on July 2 (15 DAT). DAT = days after final application of post sprays.

2008 Data Summary – Location # 2 Early and late season weed control data of several grasses in Rice, Stuttgart, AR*

Treatment	Rate (lb ai/A)	Timing	% Control ECHCG 15 DAT	% Control PANDI 15 DAT	% Control LEFSS 15 DAT
1. Command 3 ME	0.3	Pre	86 a	69 b	93 a
2. Command 3 ME	0.4	Pre	93 a	84 ab	95 a
3. Command 3 ME	0.6	Pre	94 a	86 ab	94 a
4. Command 3 ME	0.3/ 0.3	Pre/ 2leaf	92 a	85 ab	94 a
5. Command 3 ME	0.4/ 0.4	Pre/ 2leaf	92 a	83 ab	93 a
6. Command 3 ME	0.3	Pre/ 2leaf	90 a	89 a	88 a
+ Facet 75 WG	0.3	2 leaf			
7.Untreated	0	-	0 c	0 d	0 c

* ECHCG = Common barnyardgrass, PANDI = Fall panicum, LEFSS = Sprangletop. Weed control rating made on June 12 (15 DAT) and July 11 (34 DAT). DAT = days after final application of post sprays.

Command Split Application for Rice Weed Control

Add Command 3ME to the 1st Postemergence application (up 1-2 leaf rice) to enhanced barnyard grass, broadleaf signal grass, crabgrass & sprangletop control .

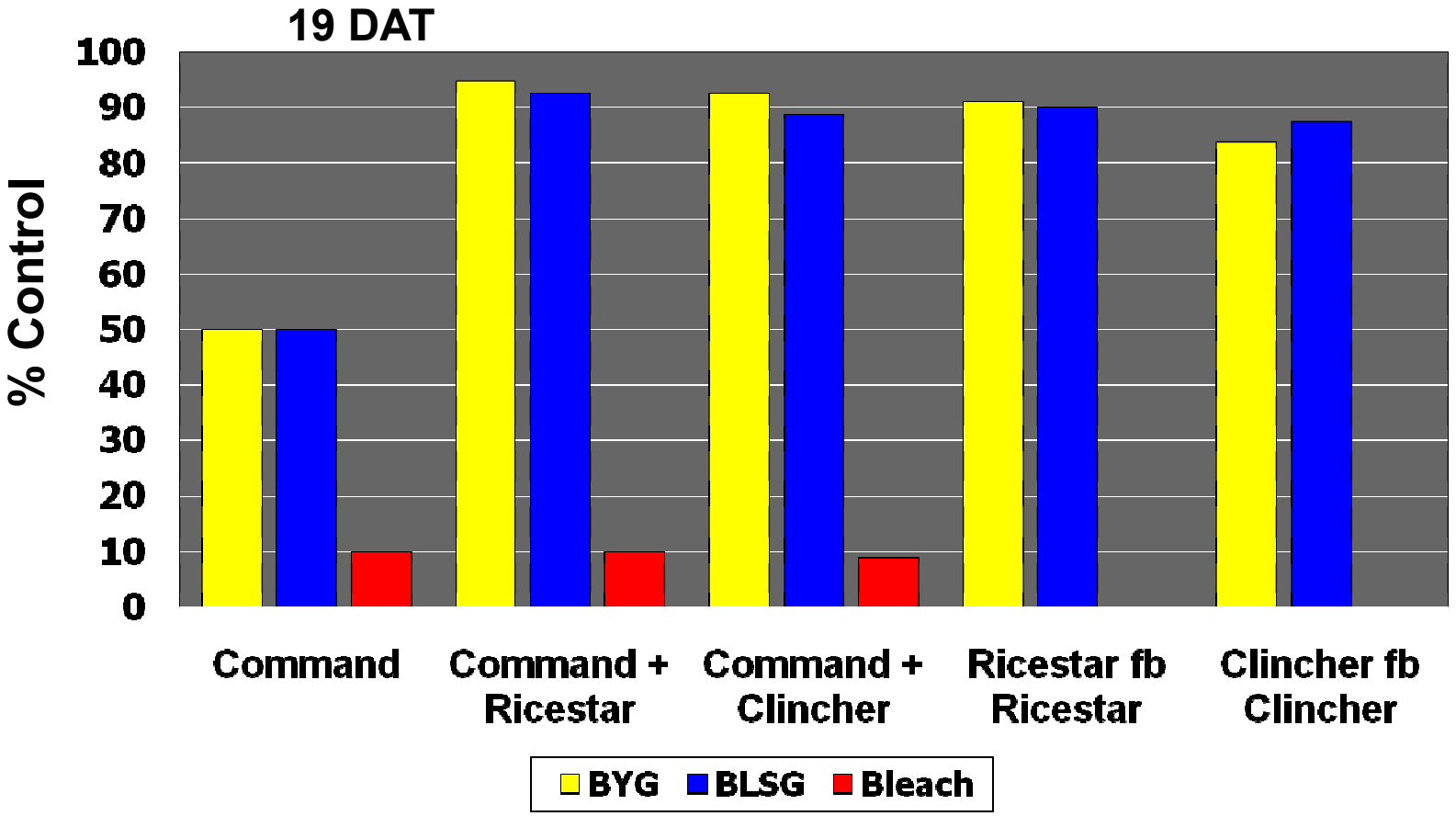
Rice:

- **Consider split applications of Command 3ME in a Conventional or Clearfield Rice Weed Control Program for extended residual grass control.**
- **Refer to label use rates of 0.67 to 1.6 pt/A based on soil type.**
- **Do not exceed 1.6 pt/A (25.6 oz/A) per season**
- **Apply prior to 3 leaf rice and annual grass emergence.**
- **Safe to all rice varieties including Clearfield Rice varieties.**
- **See Section 24c Aerial Application Label for rice in respective state: AR, LA, MO, MS, and TX.**

Command 3ME 10 oz/A fb
Command 3ME 8 oz/A +
RiceStar HT 17 oz/A
1-2 leaf Rice at 18 DAT on lighter textured soils.

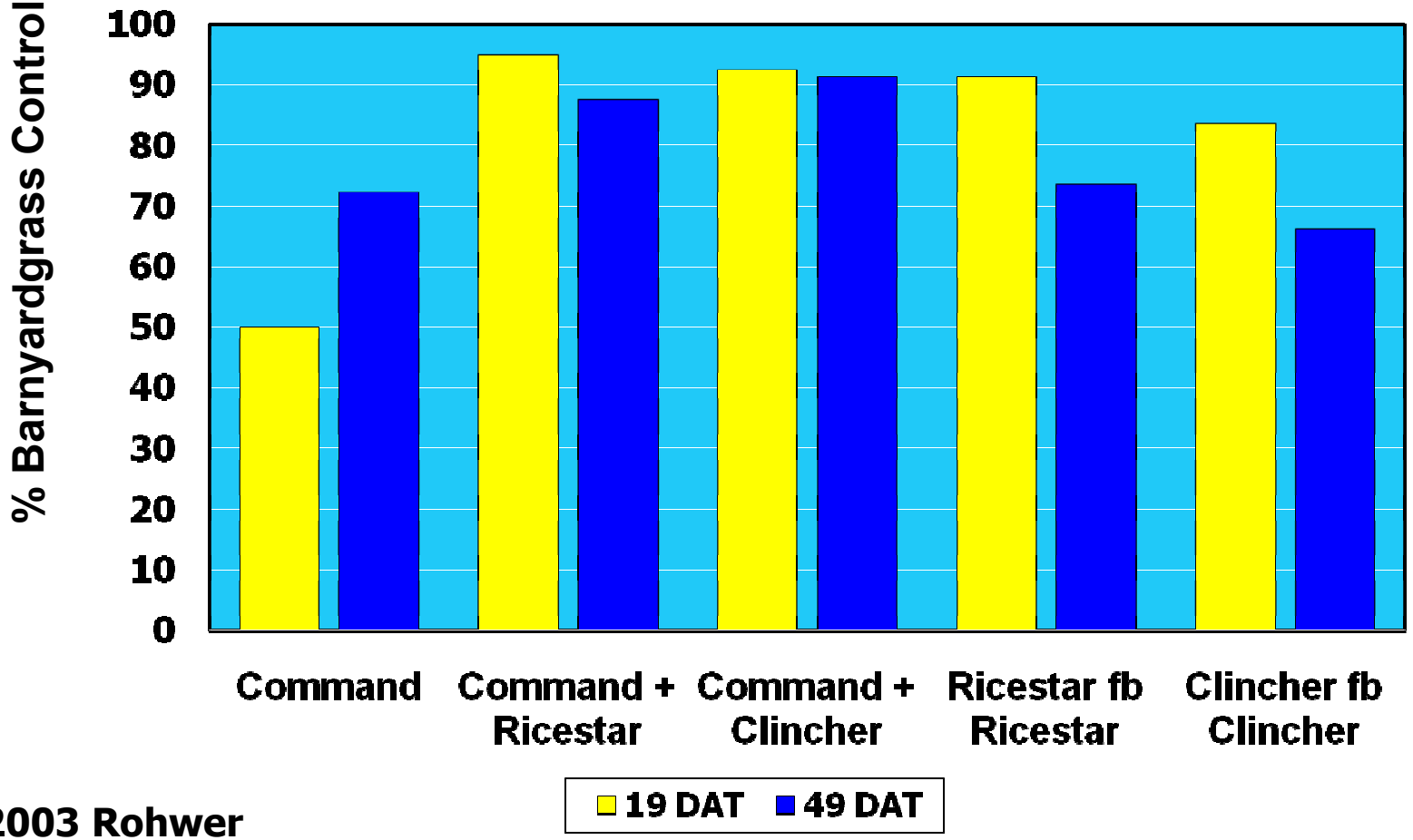
✓Excellent weed control and safety to rice.

Command + Graminicides Early POST



2003 Rohwer

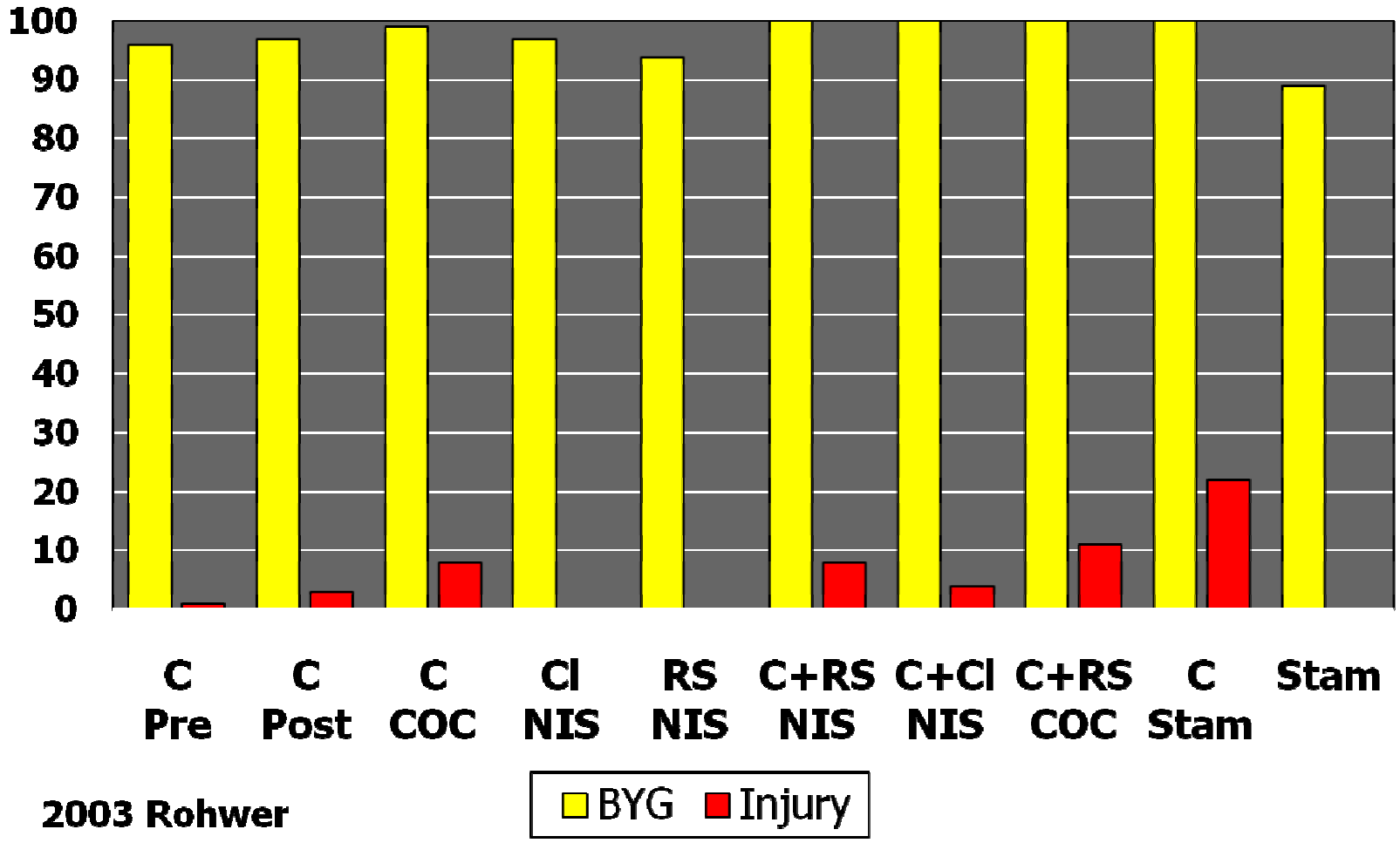
Command + Graminicides Early POST



2003 Rohwer

Command Postemergence

1-2 lf Grass



Objective

- Command Use
- Command Label Update
- Weed Resistance Management--Rice
- Command Usage in a Clearfield Program

Herbicide Resistance

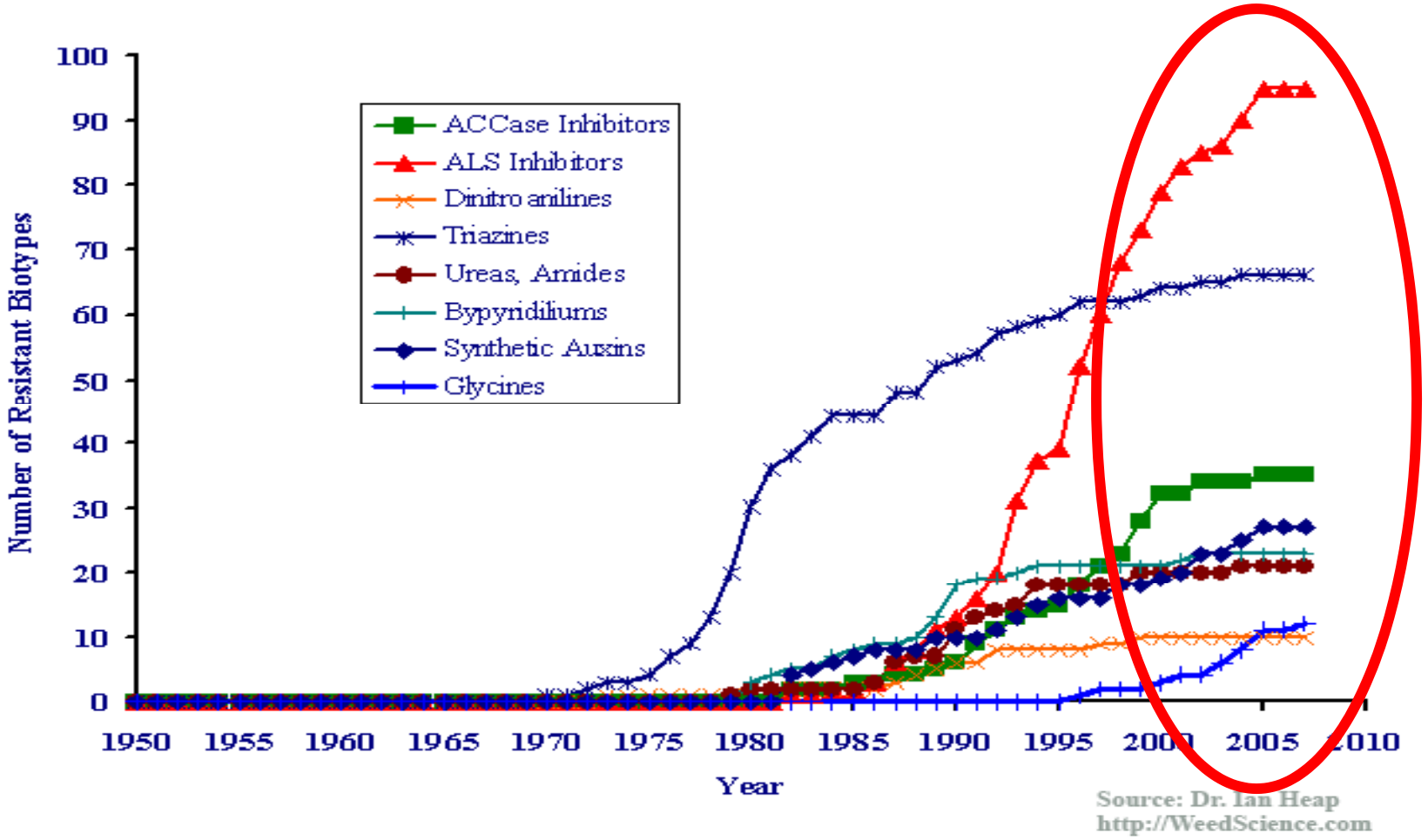
Baldwin - 2006

- It is VERY real
- Glyphosate resistant horseweed and pigweed
- Red rice out crossing
- Barnyardgrass
  - **ACC'ase and ALS inhibiting herbicides**

Rice ALS inhibitors

- NewPath
- ClearPath
- Beyond
- Regiment
- Grasp
- Permit
- Strada
- Londax

Herbicide Resistant Weed Species Found Over Time



Modes of Action & Associated Chemistries

Mode of Action	Chemistry Class	Active Ingredient	Product	Uses
Hormonal	Phenoxy-acetic Acids	2,4 - D	Rage D-Tech	Burndown
Hormonal	Quinoline carboxylic acids	quinclorac	Facet	Rice
Hormonal	Pyridine carboxyllic acid	Triclopyr	Grandstand Remedy	Rice POST Pastures
PS I Inhibitor	Bipyridinium	Paraquat	Gramoxone	Burndown
PS II Inhibitor	Amides	Porpanil	Propanil	POST Rice
PS II Inhibitor	Asymmetrical Triazine	Metribuzin	Sencor DF	Burndown, PRE, Corn, Soybeans and Potatoes and Tomatoes

Modes of Action & Associated Chemistries

Mode of Action	Chemistry Class	Active Ingredient	Product	Uses
ALS Inhibitor	Sulfonylurea	Chlorimuron Metsulfuron	Classic Ally, Cimarron	Soybeans PRE, POST Pastures, Wheat
ALS Inhibitor	Imidazolinone	Imazethapyr Imazethamox	Pursuit, NewPath Beyond	Soybeans & Rice POST
ALS Inhibitor	Pyrimidiny(tho) benzoates	Bispyribac-NA	Regiment	Rice
Lipid Synthesis Inhibitor	Thiocarbamate	Thiobencarb	Bolero	Rice POST
Long Chain Fatty Acid Inhibitors	Acetamide	Alachlor Metolachlor	Lasso Dual	PRE Corn and Soybeans
Mitotic Disruptors	Dinitoanilines	Pendamethalin	Prowl	PRE Corn and Soybeans

Modes of Action & Associated Chemistries

Mode of Action	Chemistry Class	Active Ingredient	Product	Uses
PPO Inhibitor	Aryl-Triazinone	Carfentrazone Sulfentrazone	AIM EC Spartan 4F	Soybeans, Tobacco, Sugarcane
PPO Inhibitor	Imine	Fluthiacet - methyl	Cadet	POST Corn & Soybeans
Carotenoid Inhibitors - Bleachers	Isoxazolidone	Clomazone	Command 3ME	PRE Rice, Tobacco, Soybeans
ACC-ase Inhibitors	Cyclohexanones (aka dims)	Sethoxydim Clethodim	Poast, Poast Plus Select	POST Grass Soybeans / SR Corn POST Grass Soybeans
ACC-ase Inhibitors	Aryloxy phenoxy (fops)	Fluazifop Fenoxyprop Haloxyfop	Fusilade Ricestar Clincher	POST Grass Soybeans, POST Grass Wheat POST Grass Rice

NEED TO PAY ATTENTION TO MODES OF ACTION MORE THAN CHEMISTRY

Herbicide-resistant barnyardgrass in rice

Ford Baldwin. Delta Farm Press, Thursday February 12, 2008

AR Extension Service Herbicide Resistance Screening -2008

- **50% propanil resistant BYG**
- **50% Facet resistant BYG**
- **2 isolated locations Command resistant BYG (2007)**
- **0 RiceStar / Clincher (Accase inhibitor) resistant BYG**
- **2 locations RiceStar / Clincher resistant sprangletop (LA)**
- **1 location NewPath / Grasp (ALS inhibitor) resistant BYG**

"This should serve as a warning to Clearfield rice growers. We cannot rely solely on Newpath and Beyond for weed control on these acres…"

Objective

- Command Use
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- Weed Resistance Management--Rice
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Arkansas Rice - Controlling grass and resistance difficult

Ford Baldwin. Delta Farm Press, Friday November 21, 2008

Consultant and retired university rice specialist.

“Command, in my opinion, is the foundation herbicide for grass control and one we can least afford to lose. When it is taken out of the weed control program, barnyardgrass control becomes much more difficult.

Even in Clearfield rice, some of the biggest grass control messes I see are where Command was left out of the program because the grower felt like Newpath would provide adequate control”.

Command / Aim Weed Control Use Patterns In Rice

Weeds	Command	Aim	Command Aim	Command Aim/Propanil	Command Aim/Permit	NewPath fb NewPath
Morninglories	3	9	9	9	9	6
Hemp sesbania	0	9	9	9	9	0
Jointvetch	0	9	9	9	9	0
Cocklebur	4	8	8	9	8	9
Texas Weed	0	8	8	9	8	?
Redweed	0	9	9	9	9	?
Purslane	3	9	9	9	9	?
PA Smartweed	4	8	8	8	8	9
Waterhys spp.	0	9	9	9	9	0
Dayflower	5	7	8	8	8	5
Duck salad	0	5	5	7	5	7
Eclipta	3	7	7	9	7	0
Redstem	0	5	5	8	5	8
Rice Flat Sedge	0	5	5	9	8	9
Nutsedge	0	3	3	5	9	8
Barnyardgrass	9	0	9	9	9	9
BL Signal Grass	9	0	9	9	9	9
Sprangletop	9	0	9	9	9	7
Crabgrass	9	0	9	9	9	9
Fall Panicum	9	0	9	9	9	9
Alligator Weed	0	5	5	5	5	?

80% > Control 50% to 70% Control No Control

Clearfield Rice Programs

- Command Pre
- Commad Epost + NewPath
- Newpath + Aim (combinations)

Command: The Foundation of Clearfield Rice Weed Control Programs

- Apply from 14 days before planting up to 7 days after planting but prior to weed emergence.
- Refer to label use rates of 0.67 to 1.6 pt/A based on soil type.
- Safe to Clearfield rice varieties.
- Consider split applications of Command 3ME in a Clearfield rice weed control program for enhanced sprangletop and other annual grass control.
- Do not exceed 1.6 pt/A (25.6 oz/A) per season.
- See Section 24c aerial application label for rice in respective states: AR, LA, MO, MS, TX

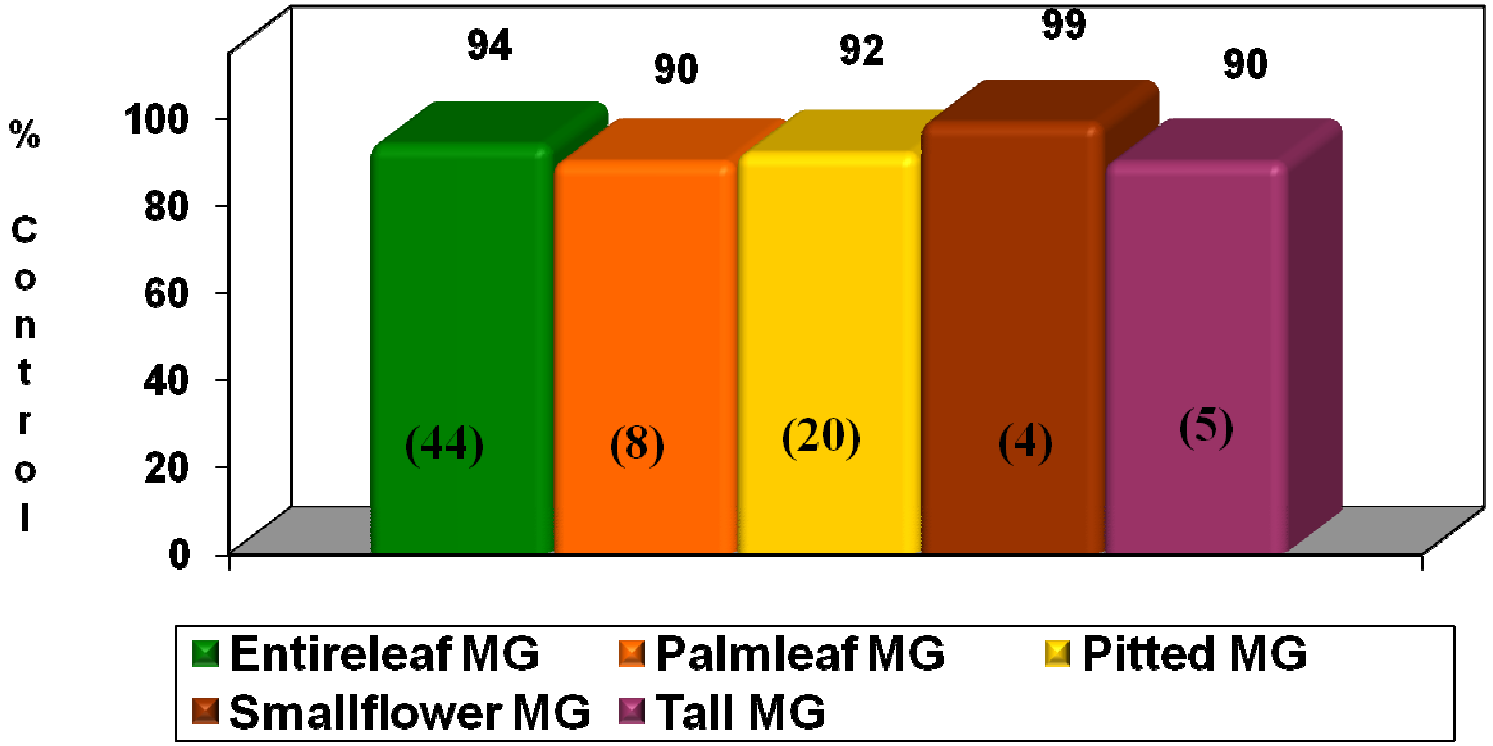
Command 3ME 12 oz/A fb

Command 6 oz/A + NewPath 4 oz/A + NIS 0.25 v/v fb

New Path 4 oz/A + NIS 0.25 v/v

Red Rice Controlled - *196 bu/A*
(Univ. Mo Portageville , MO 2006)

AIM EC / RICE
Data Summary through 2003
Aim 1.0 oz + NIS Post (7-14 DAT)

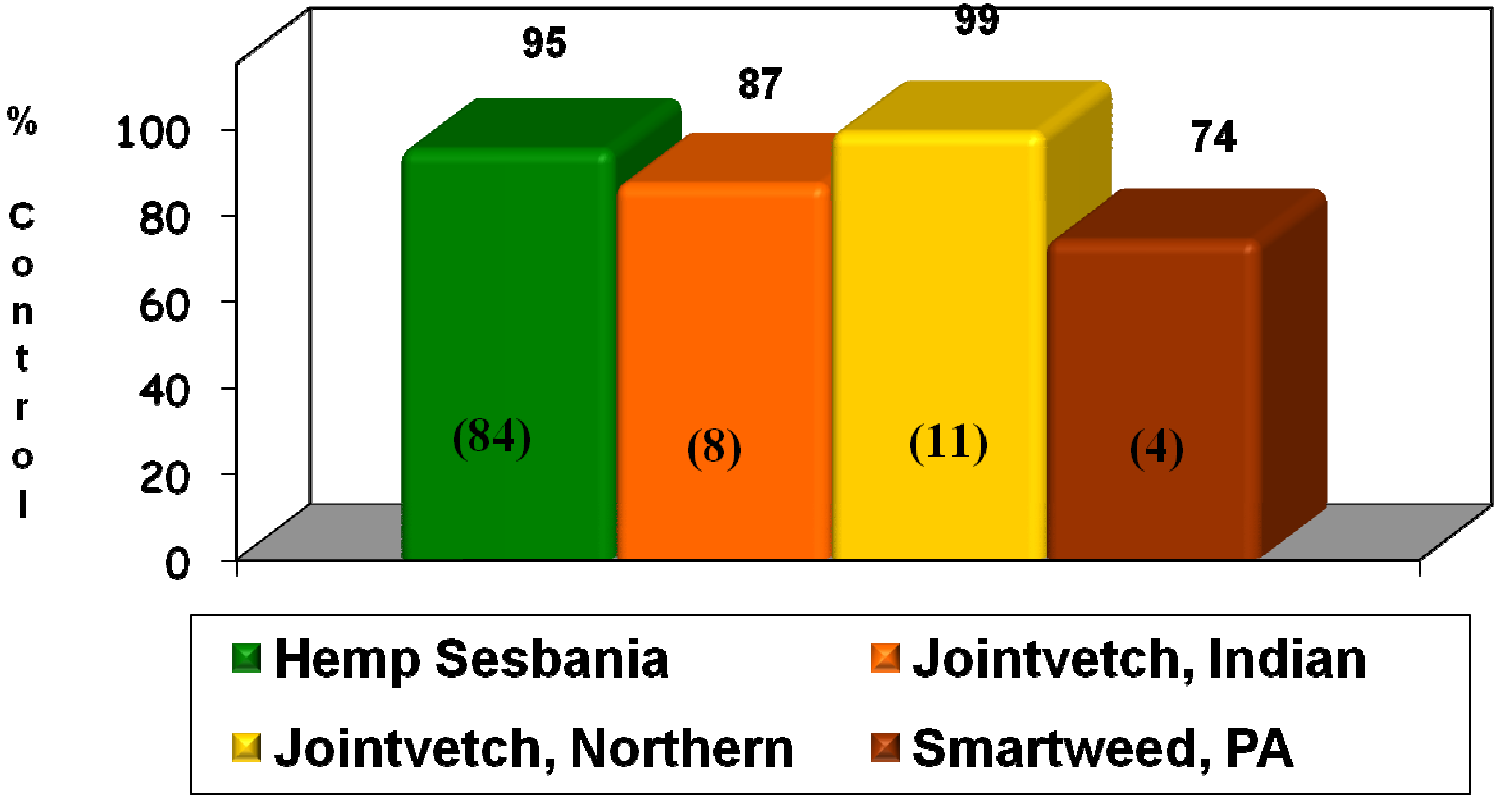


( ) = number of observations

AIM EC / RICE

Data Summary through 2003

Aim 1.0 oz + NIS Post (7-14 DAT)



( ) = number of observations

Untreated

- Morningglory
- Hemp sesbana
- Pigweed

Aim 1.0 oz/A + 0.25% NIS

7 DAT

Command 3ME PRE @ 21 oz/A

Annual Grass Control Rice Programs

- **Command (Pre)**
  - First line of defense for annual grass control in conventional or Clearfield rice
  - Assist in sprangletop control in Clearfield program
  - Start clean with residual product down
  - Eliminate rice seedling competition of yield robbing annual grasses
  - Shoot for a rain or flush if necessary

- **Command + (Epost)**
  - Newpath (Clearfield rice)
  - Quinclorac (conventional rice, no grass emerged)
  - Ricestar HT or Clincher (escaped grass emerged)
  - Aim or propanil (broaden broadleaf weed control)

  - Extended soil residual activity to carry you through flood
  - Assist in sprangletop control
  - Utilize 2-3 modes of action for resistance management

- **Newpath + Aim (combinations)**
  - Assist in morningglory, jointvetch, hemp sesbania and pgweed control
  - Resistance management with two modes of action

Control Grasses in Clearfield Rice

Dr. Ford Baldwin. Delta Farm Press, Friday December 5, 2008

“I (Baldwin) recommend that Clearfield programs begin with Command. In conservation tillage programs the Command can be applied before planting with the burn-down herbicide or as a pre-emergence herbicide as it would be used in conventional tillage systems.

In the first NewPath application you have the option of adding more Command to extend the length of residual and help on sprangletop control.”

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Thank You

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