THE UNIVERSITY OF ARIZONA

COLLEGE OF AGRICULTURE AND LIFE SCIENCES

COOPERATIVE EXTENSION
School of Plant Sciences

Chemical Weed Control in Alfalfa – 2019

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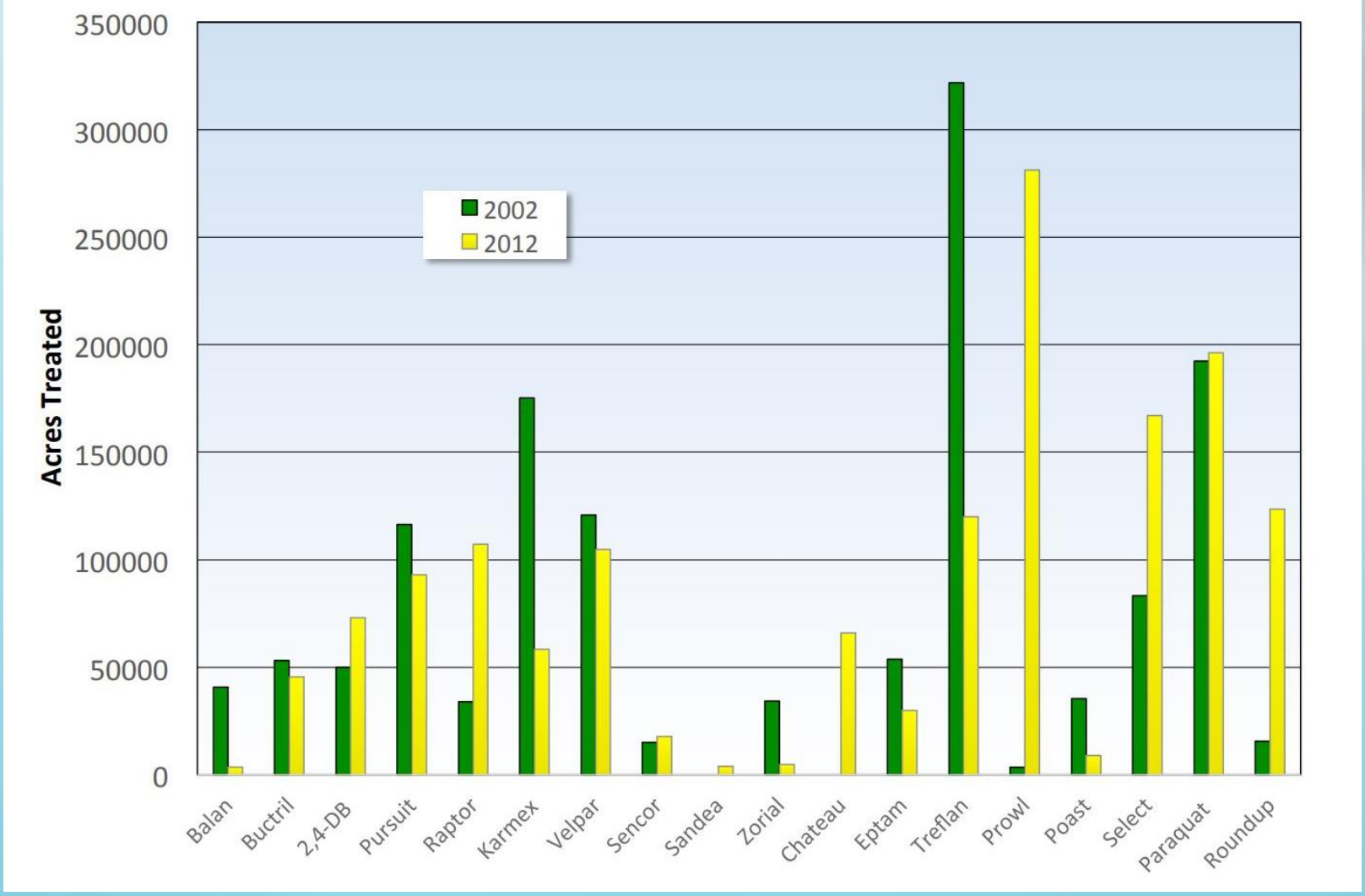
Extension Weed Science

Alfalfa Herbicide Timeline

Pre 1970	1977-78	1980-84	1992-96	2000-04	
Eptam	Balan (’77)	Velpar (’82)	Prowl (’92)	Sandea (’02)	
Butyrac	Buctril (’78)	Poast (’83)	Pursuit (’93)	Raptor (’02)	
Gramoxone		Treflan TR-10 (’84)	Select (’94)	Chateau (’03)	
Metribuzin			Solicam (’96)	Prowl H_2O (’04)	
Diuron					
Kerb					
Roundup					
Treflan					

Adapted from Orloff & Tickes, 2014 – California Alfalfa Conference

Alfalfa Herbicide Use Tulare County, CA 2002 *versus* 2012



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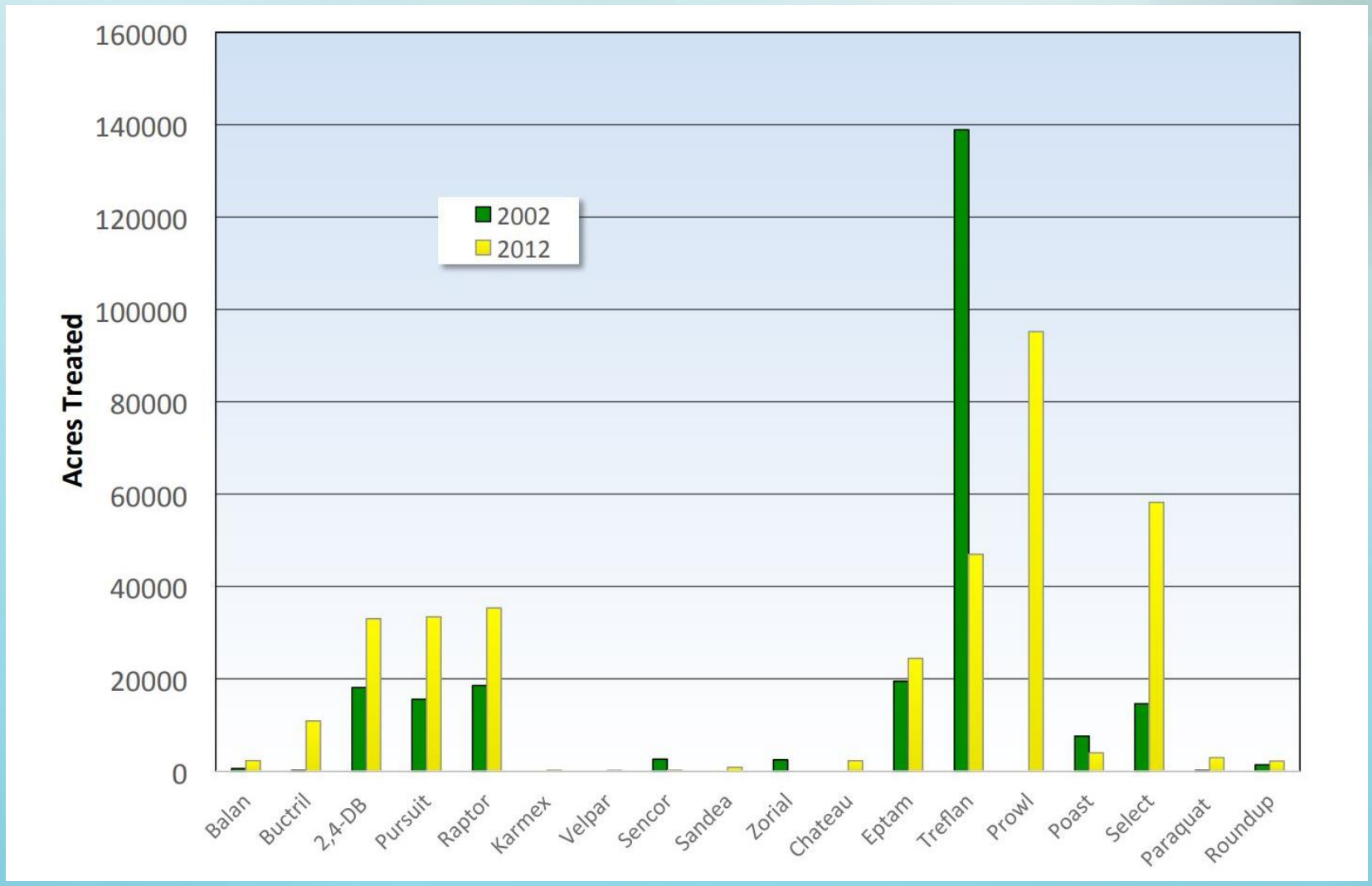
Alfalfa Herbicide Use Imperial County, CA 2002 *versus* 2012



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Alfalfa Herbicide Timeline

Pre 1970	1977-78	1980-84	1992-96	2000-04	2015-18
Eptam	Balan (’77)	Velpar (’82)	Prowl (’92)	Sandea (’02)	Sharpen (‘15)
Butyrac	Buctril (’78)	Poast (’83)	Pursuit (’93)	Raptor (’02)	Aim (’16)
Gramoxone		Treflan TR-10 (’84)	Select (’94)	Chateau (’03)	Warrant (‘18)
Metribuzin			Solicam (’96)	Prowl H_2O (’04)	
Diuron					
Kerb					
Roundup					
Treflan					

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Arizona Alfalfa Production Challenges

- The usual winter and summer desert weeds
- Few acres of Roundup Ready Alfalfa
  - Lack of export market for GMO RR alfalfa
  - Lack of non-dormant varieties
  - Lack of heat tolerance
- Glyphosate & ALS resistant Palmer amaranth
  - ALS inhibitors = Raptor, Pursuit, Staple, Envoke, Sandea

Glyphosate resistant Palmer amaranth in Buckeye, AZ cotton fields - 2012

Glyphosate Resistant Palmer amaranth Coolidge – August 24, 2016

Glyphosate Resistant Palmer Amaranth in Marana (2017)

Cochise County center pivot (2014)
RR corn, post-season tillage & monsoon rainfall
Sprayed with glyphosate

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Palmer amaranth on field edge of silage crop

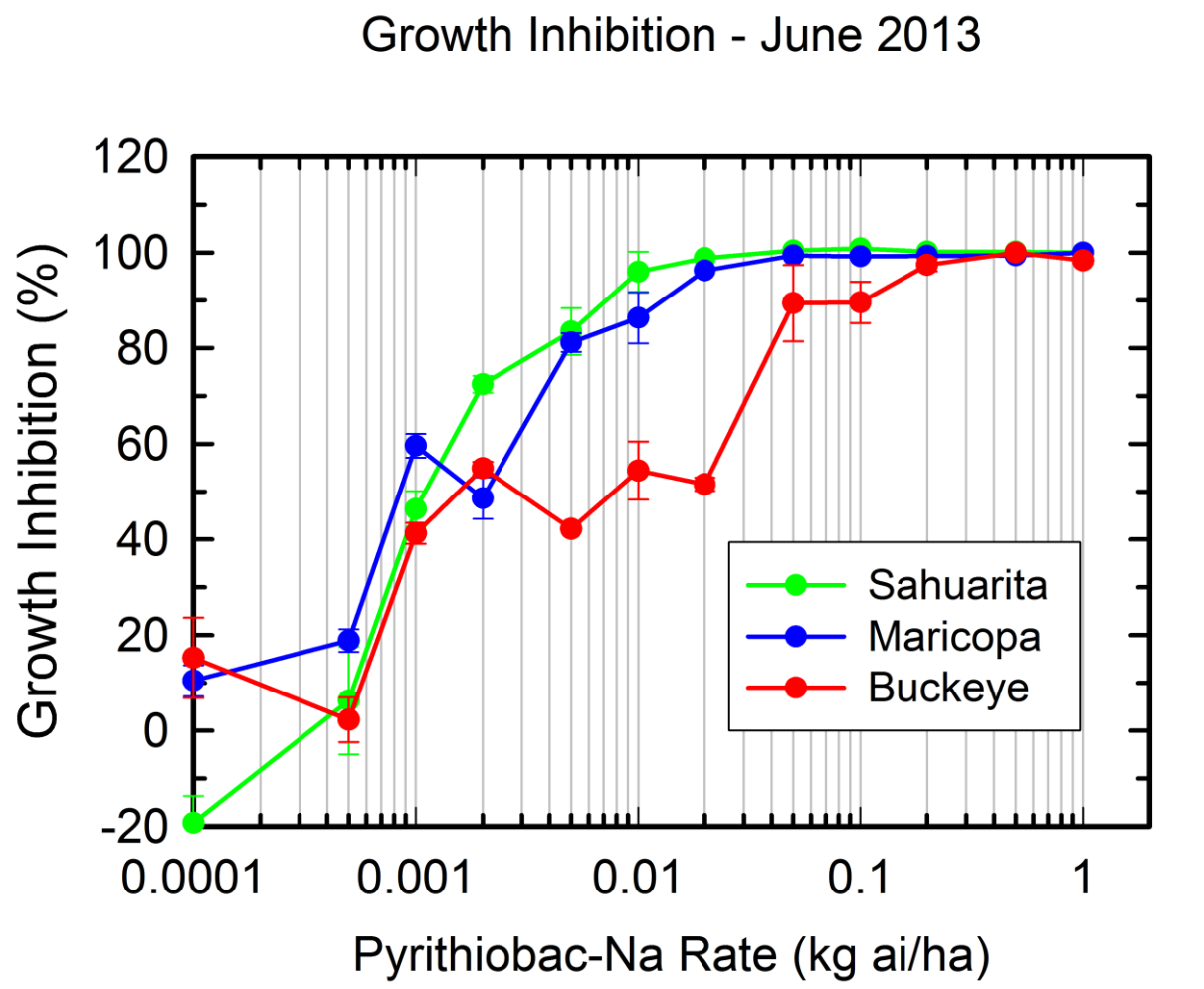
Palmer amaranth on berms in alfalfa field, Flood versus drip irrigation

Glyphosate resistant Palmer amaranth in Arizona
A common sight when driving Interstate-10

- Parker – alfalfa
- Buckeye – cotton – GH: Roundup & Raptor, Staple)
- Maricopa – corn, cotton
- Coolidge – cotton
- Red Rock – pecans
- Marana – cotton
- Pearce – corn, cotton
- Safford – ditch bank, cotton
- San Simon – pecans Also hairy fleabane

Kg ai/ha

Sahuarita (top) & Buckeye (bottom) Palmer amaranth response to Pyrithiobac-Na 22 DAT



Palmer amaranth Growth Inhibition 22 DAT with Staple (pyrithiobac-Na)

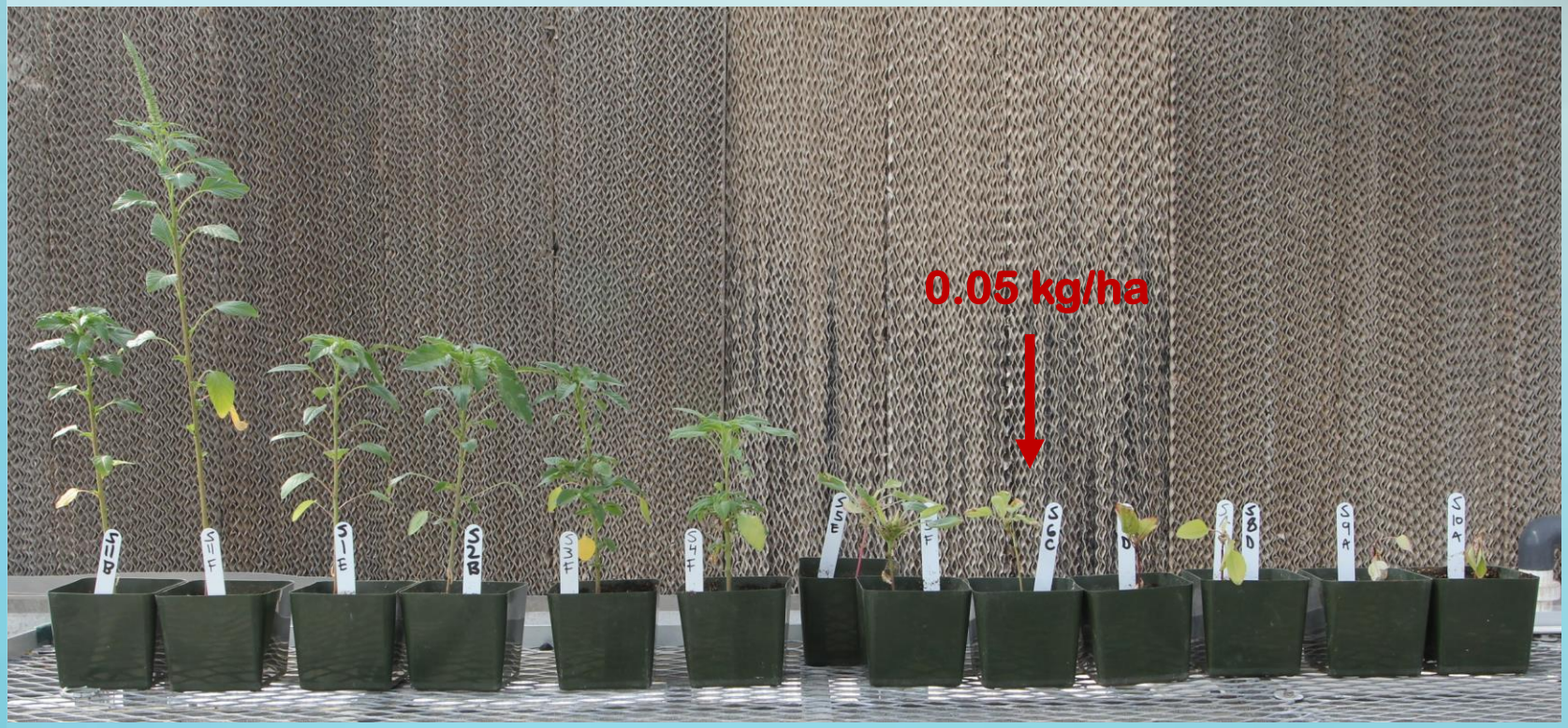
Central Arizona

San Tan Valley alfalfa field sprayed with Raptor and Pursuit – Fall 2013

Palmer amaranth differential response to Raptor and Pursuit – Fall 2013

Loss of alfalfa density and1st harvest problems due to Palmer amaranth escapes following Raptor & Pursuit application in summer planted fields.

Sahuarita Palmer amaranth response to Raptor 22 DAT



0.05 kg ai/ha ~ 6 fl. oz./A

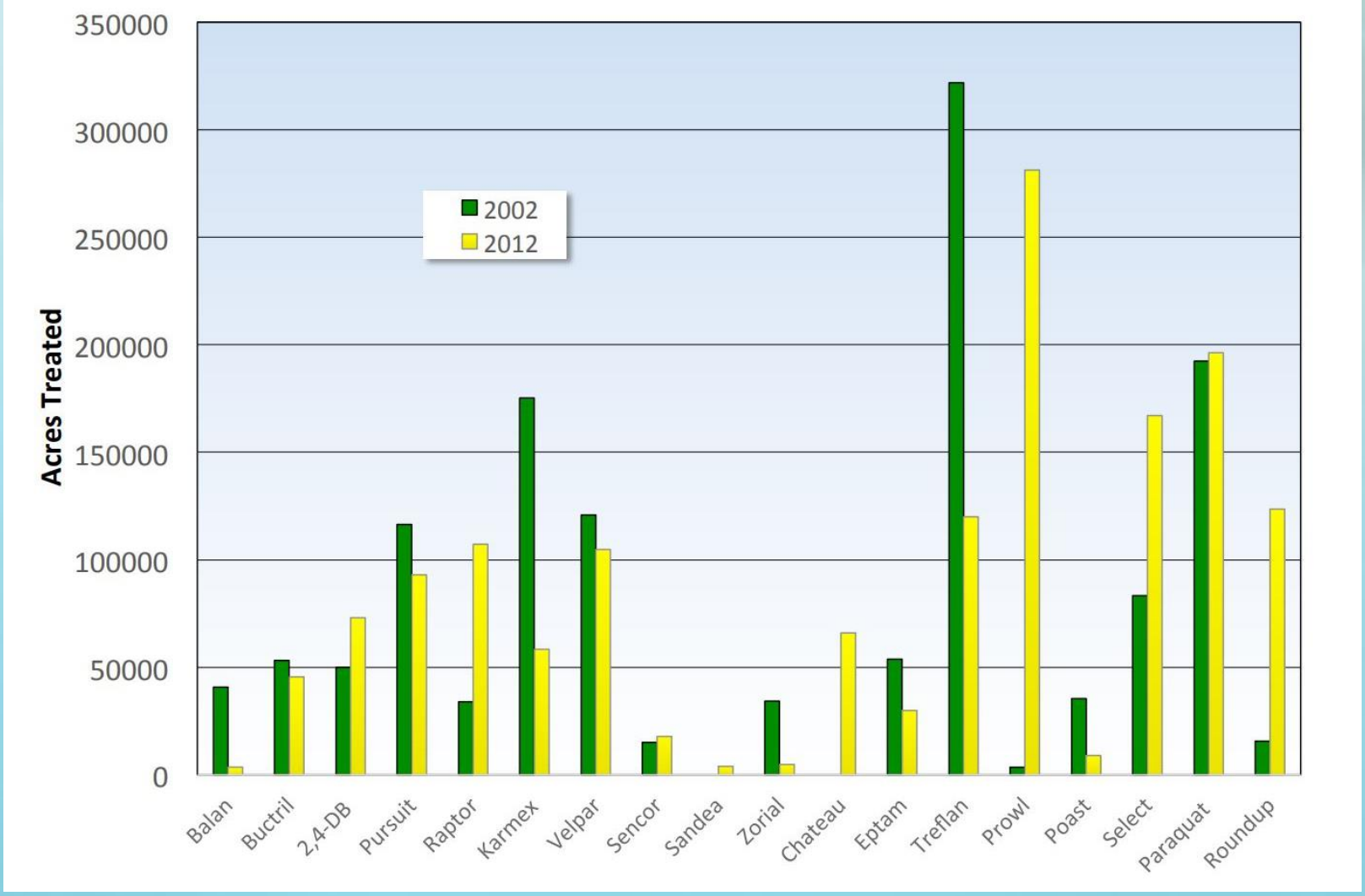
Gantzel (San Tan Valley) Palmer amaranth response to Raptor

0.05 kg ai/ha ~ 6 fl. oz./A

Selected Alfalfa Herbicides (Palmer?)

- Preemergence *(Preplant Balan not recommended)*
  - Treflan TR10, Triap 10G (PREE) – grasses, broadleaves
  - Prowl H_2O, Treflan
  - Eptam 7E & 20G (PPI & PREE) – grasses, broadleaves, nutsedge
  - Chateau, Velpar AlfaMax Gold (diuron+hexazinone), Solicam (all PREE) – grasses, broadleaves
- Postemergence
  - Buctril – broadleaves only
  - 2,4-DB – broadleaves only
  - Pursuit – mostly broadleaves
  - Raptor – broadleaves, grasses
  - Poast & Select Max – grasses only
  - Glyphosate (Roundup) – grasses, broadleaves, nutsedge

Alfalfa Herbicide Use Tulare County, CA 2002 *versus* 2012



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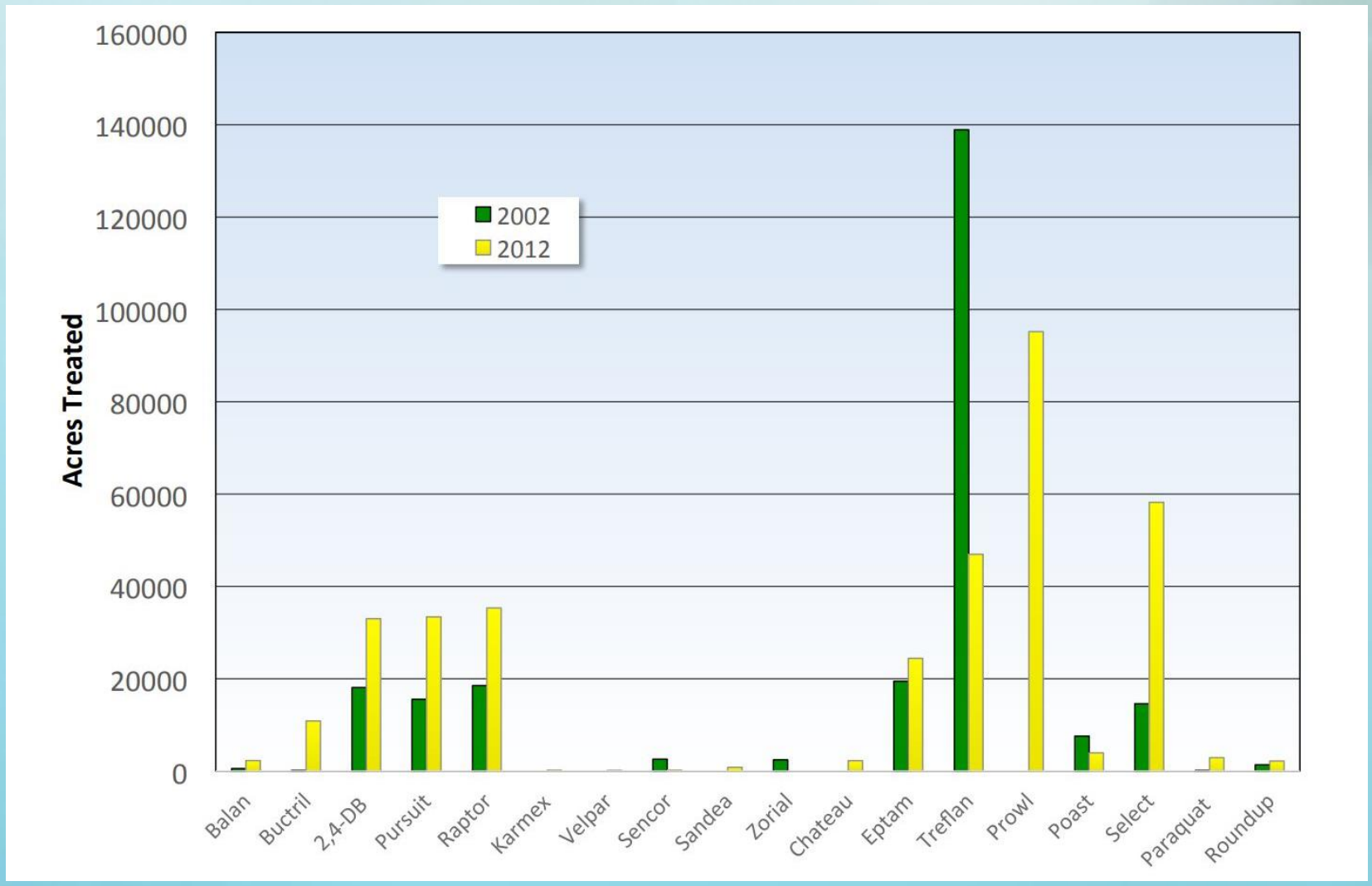

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Arizona Alfalfa Production Challenges

- Low acres of Roundup Ready Alfalfa
  - Lack of export market for GMO – RR alfalfa
  - Lack of non-dormant varieties
  - Lack of heat tolerance
- Glyphosate & ALS resistant Palmer amaranth
  - ALS inhibitors = Raptor, Pursuit, Staple, Envoke, Sandea
- Commonly used and new herbicides

Major		**Minor**		**New**
2,4-DB	Treflan	Roundup	Diuron	Sharpen
Pursuit	Prowl	Paraquat	Velpar (hexazinone)	Aim
Raptor	Select	Chateau	Gramoxone	Warrant

Alfalfa Seedling Weed Control

- Roundup Ready alfalfa
  - Flexible rate 22 to 44 oz/A (4.5 lb a.e./gallon)
  - Flexible application timing (3 to 9 trifoliate leaf)
    - AMS at 8 to 17 lb/100 gal H_2O
- Avoid poor performance at low (and high) temp.

Alfalfa Seedling Weed Control

- Seedling alfalfa – never harvested
  - Pursuit – 3 to 6 oz/A – mostly broadleaves
  - Raptor – 4 to 6 oz/A – broadleaves & grasses
  - Pursuit 3 oz/A + Raptor 3 oz/A
    - NIS or COC (0.25-0.5% v/v or 1% v/v)
      UAN32 or AMS (2.5 gal or 12-15 lb/100 gal H_2O)
    - Apply at 2nd trifoliate leaf, Weeds 1 – 3 inches
  - Prowl H_2O – 1.1 to 2.1 pints/A
    - Seedlings 2nd trifoliate leaf to 6 inches tall
    - Will not control emerged weeds

Established Alfalfa (after the 1st cutting)

- Before weeds emerge – spring, summer:
  - Triflualin 10G granules – 2 lb ai/A, 20 lb/A (21 day PHI)
  - Prowl H_2O – 1.1-4.2 qt/A (2-3 lb ai/A), chemigation (14 day PHI)
  - Treflan – 2 qt/A (2 lb ai/A), chemigation (21 day PHI)
  - Solicam – spray or chemigation (28 day PHI)
    - After 5 months: 1.25 lb/A fb 1.25 lb/A
    - 2nd year 1.25 to 2.5 lb/A
    - Nutsedge or spot treatment for problem weeds such as bermudagrass and field sandbur
- Herbicide sprayed on alfalfa leaves is retained on foliage and does not stop weed seed germination in the soil.
  - Large carrier volume & large droplets or chemigation

Established Alfalfa - Winter

- Before weeds emerge (winter):
  - Velpar Alfamax Gold – 1 to 2.2 to 3.2 lb/A (30 day PHI)
  - Chateau – 4 oz/A (8 oz per year) (25 day PHI)
  - Solicam – 1.25 + 1.25, 2.5 lb/A (2.5 lb/year) (28 day PHI)
- No surfactant
- After green-chop, sheeping, etc.
- Regrowth < 2” to 6”

Established Alfalfa

- After the weeds emerge:
- RR alfalfa only: Roundup PowerMax
  - 22 to 44 oz/A + AMS; maximum of 132 oz/year
  - 5 times-26 oz/A; 4 times-33 oz/A; 3 times-44 oz/A
- Conventional alfalfa:
  - Pursuit – 3 to 6 oz/A but long soil residual
  - Raptor – 4 to 6 oz/A broadleaves, grasses +NIS or COC+AMS
    spray when alfalfa has minimal regrowth, No PHI
  - Poast – 1 .5 to 2.5 pt/A + COC + AMS or UAN
    PHI= 14 days; 6.5 pt/A per season
  - Select Max – 16 to 32 oz/A + COC, + AMS
    PHI=15 days; 64 oz/A per season
  - Sandea – stunting & yield loss, rescue situations, summer slump

Saflufenacil (Sharpen)

- Sharpen – recent experiments/label
  - Spray right after cutting and removal of bales,
  - 1 to 2 fl. oz./A + Methylated Seed Oil (MSO) + AMS,
  - water back 2 to 3 days after spraying
  - Label says use on dormant alfalfa
  - PHI: 28 days
  - 1 application per year
  - ***Will look ugly initially!***
- Better burndown than other chemistries
  - Paraquat (broad spectrum), Aim (broadleaves only)

Acetochlor (Warrant)

- Warrant – see 24c label (newest registration)
  - 1.25 to 2 qt./A depending on soil type & OM
  - Seedling alfalfa: emergence to 4 trifoliate leaf
  - Seedling year: after 1st or 2nd cutting
  - Established: max of 3 applications per season
  - Maximum of 4 quarts per year
  - Apply within 7 days of cutting
  - Do not harvest or graze for 20 days
  - Ground application only

A=4 trifoliate leaf

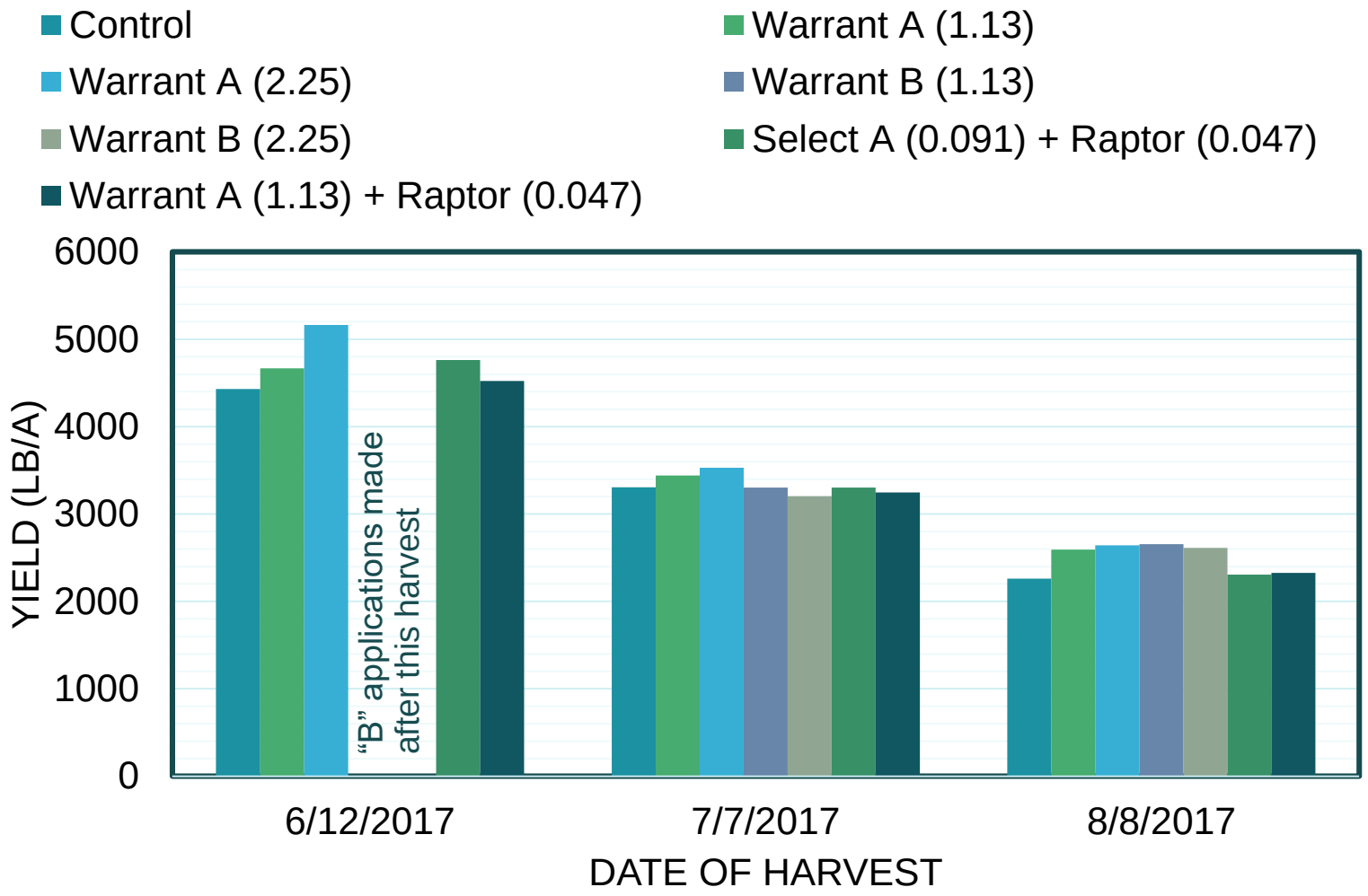
B=After 1st cutting

Rates=lb ai/A

Alfalfa Yield

MAC – 2017 B90

Warrant tank mixed with Roundup



A=4 trifoliate leaf

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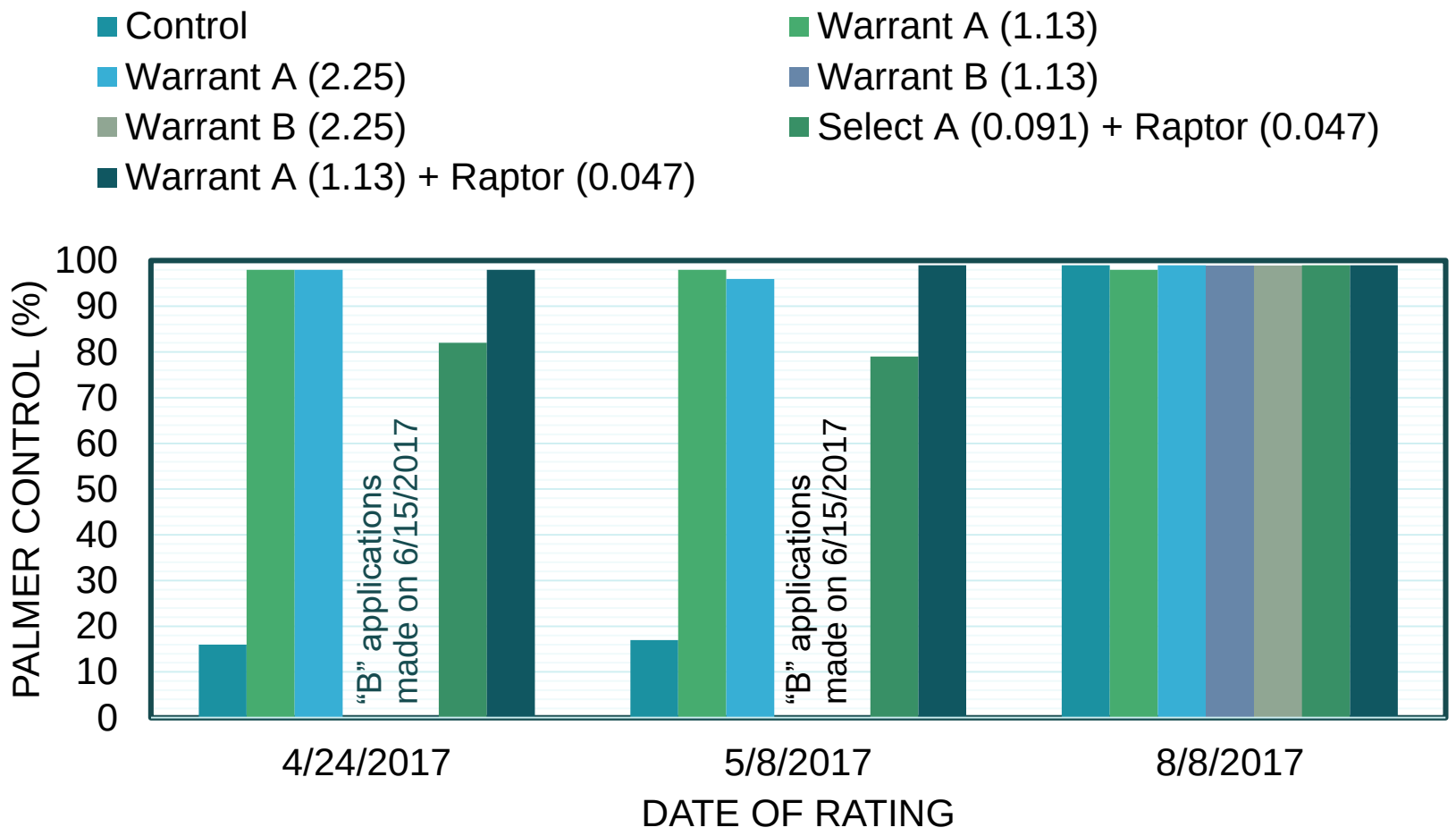
Rates=lb ai/A

Palmer amaranth Control

MAC – 2017 B90

Warrant tank mixed with Roundup



A=4 trifoliate leaf

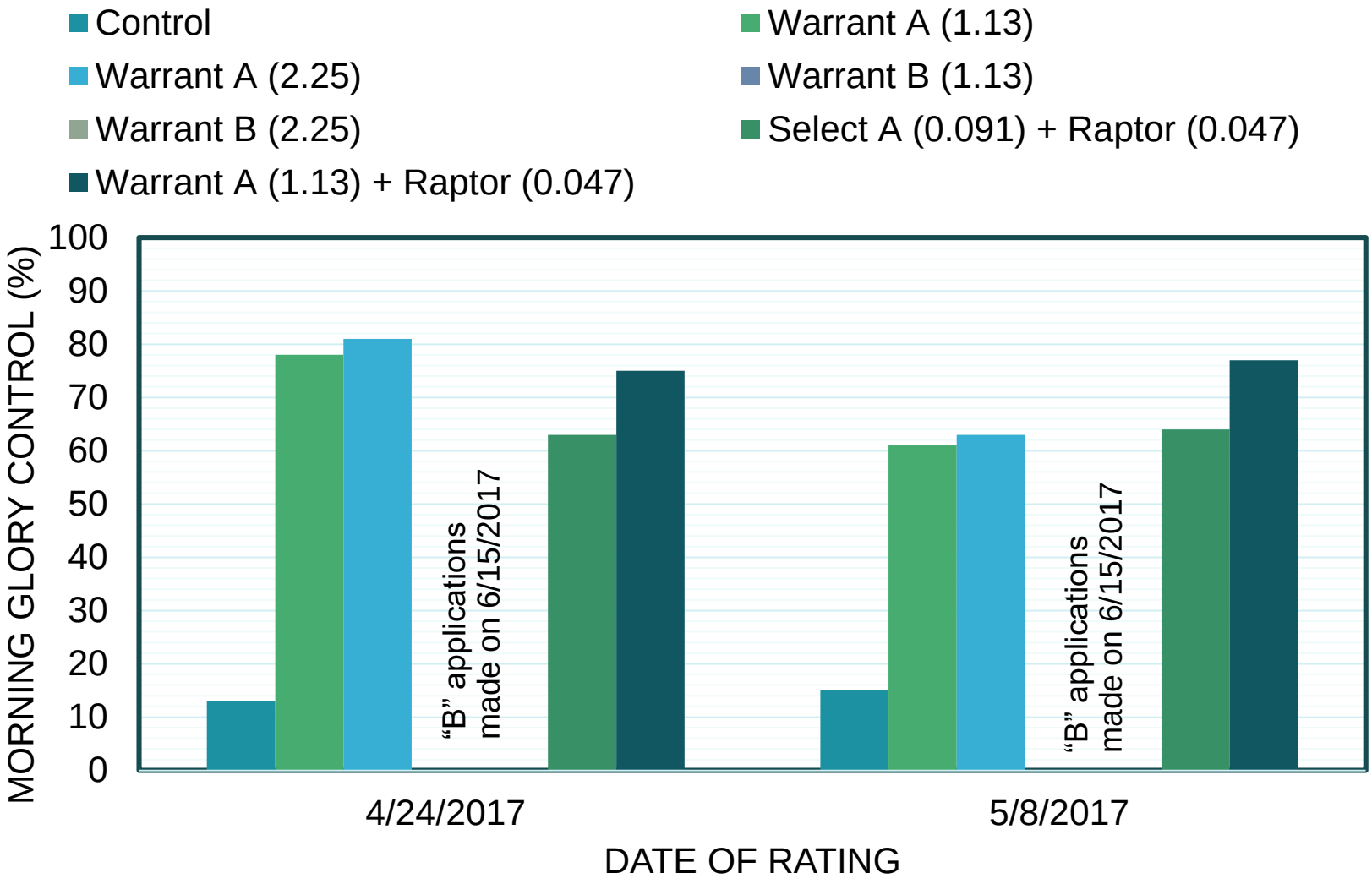
B=after 1st cutting

Rates=lb ai/A

Morningglory Control

MAC – 2017 B90

Warrant tank mixed with Roundup



Managing Weed Populations for Sustainable Control

- Proactive weed management
- Managing weed seed banks
  - Sanitation
  - Zero tolerance for seed production
  - Across crop rotation sequences
- Product stewardship
  - Diversity in herbicide MOA (tank mixtures) & other tactics
- Sustainable weed control = keeping weed populations susceptible to herbicides