

# Dry Beans

## Weed Management



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# Dry Beans

## General Comments

1. Dry beans are more sensitive to herbicides than soybeans
2. Market classes respond differently to herbicides
3. Weed management programs need to be developed by market class



Treflan + Pursuit; Lorox

# Dry Beans

## General Comments

1. Three groups of dry beans in respect to weed management
  - a. Small seeded beans
    - i. White & black beans
  - b. Large seeded beans
    - i. Kidney & cranberry beans
  - c. Adzuki beans



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Treflan (500 mL/ac) + Pursuit (75 mL/ac)

# Dry Beans

## Question # 1

There are 4 soil applied grass herbicides (Dual, Eptam, Frontier and Treflan). Which one should I use?



Ragweed escapes with Treflan



Ragweed escapes with Frontier

# Dry Beans

## Annual Grass Control (Cost/Acre)

Treatment	Low Rate \$/Acre	High Rate \$/Acre
Treflan	8	15
Dual II Magnum	19	28
Frontier Max	20	25
Eptam	31	40

1. Treflan is the lowest cost
2. Dual & Frontier are intermediate in price
3. Eptam is the most expensive

# Treflan, Rival and Bonanza

## General Comments

1. Apply PPI
2. Excellent crop tolerance
  - a. Only registered on black, kidney and white beans
3. Excellent full season annual grass control
  - a. Good control of sandbur
4. Control/suppression of annual broadleaf weeds
  - a. Lamb's-quarters
  - b. Pigweed
5. Pursuit tankmix for white beans

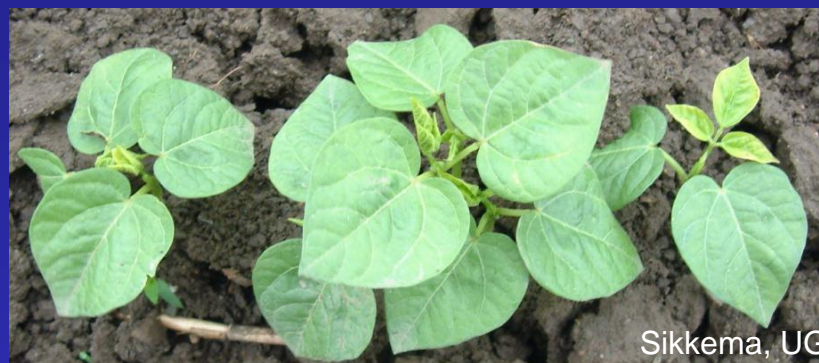


Treflan + Pursuit

# Treflan, Prowl and Sonalan

## Injury

1. Injury rarely occurs in dry beans
2. Injury is more likely when the crop emerges slowly
3. Injury may occur on light textured soils that are low in organic matter (adjust herbicide rate)
4. Clubby swollen roots
5. Hypocotyl swelling and cracking
6. Stunted growth



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Adzuki bean - Check



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Adzuki bean - Treflan

# Eptam

## General Comments

1. Apply PPI
2. Good crop tolerance
  - a. Registered on black, brown, cranberry, kidney, pinto, yellow eye and white beans
  - b. Not registered on otebo and SRM beans
  - c. Not registered on adzuki beans
3. Good annual grass control
  - a. Short residual activity
4. Suppression of ...
  - a. Small seeded broadleaf weeds
  - b. Quack grass
  - c. Nutsedge
5. Treflan tankmix for improved grass control and broadleaf weed suppression
  - a. White & kidney only



Eptam + Treflan (PPI):  
Basagran + Raptor (POST)



# Eptam

## Injury

1. Injury rarely occurs in dry beans
  - a. Do not use on adzuki beans
2. Injury is greater ...
  - a. When the crop emerges slowly
  - b. Under dry conditions
    - i. Delay planting 7-10 days
3. Injury symptoms include ...
  - a. Crinkled and malformed leaves
  - b. Stunted and necrotic growing point
  - c. Bud-seal



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Adzuki bean - Check



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Adzuki bean - Eptam

# Dual and Frontier

## General Comments

1. Apply PPI or PRE
2. Fair crop tolerance
  - a. Registered on all market classes of dry beans
  - b. Not registered on adzuki beans
3. Excellent control of specific annual grasses
  - a. Weak on fall panicum, proso millet and sandbur
4. Some control/suppression of broadleaf weeds
  - a. Eastern black nightshade and pigweed
  - b. Frontier provides greater broadleaf weed suppression
5. Dual is more consistent on yellow nutsedge
6. Pursuit tankmix (PPI or PRE)



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Frontier



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Frontier + Pursuit

# Dual and Frontier

## Injury Symptoms

1. Marginal chlorosis of the unifoliates followed by necrosis
2. Unifoliates may be completely burnt off
3. Leaf distortion (crinkling) of the first trifoliolate
4. Delay in plant development



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Frontier Injury

# Dual injury symptoms





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## Frontier injury symptoms in white beans

# Dual and Frontier

## Increased potential for injury ...

1. On small seeded market classes
  - a. White & black beans
2. When applied PRE
  - a. PPI is safer
3. With Frontier compared to Dual
4. Under cold, wet conditions and the beans emerge slowly
5. When heavy rainfall occurs at bean emergence following a PRE application
6. If the beans have started to emerge
7. Coarse-textured soils low in organic matter
  - a. Use the lower rate on the label

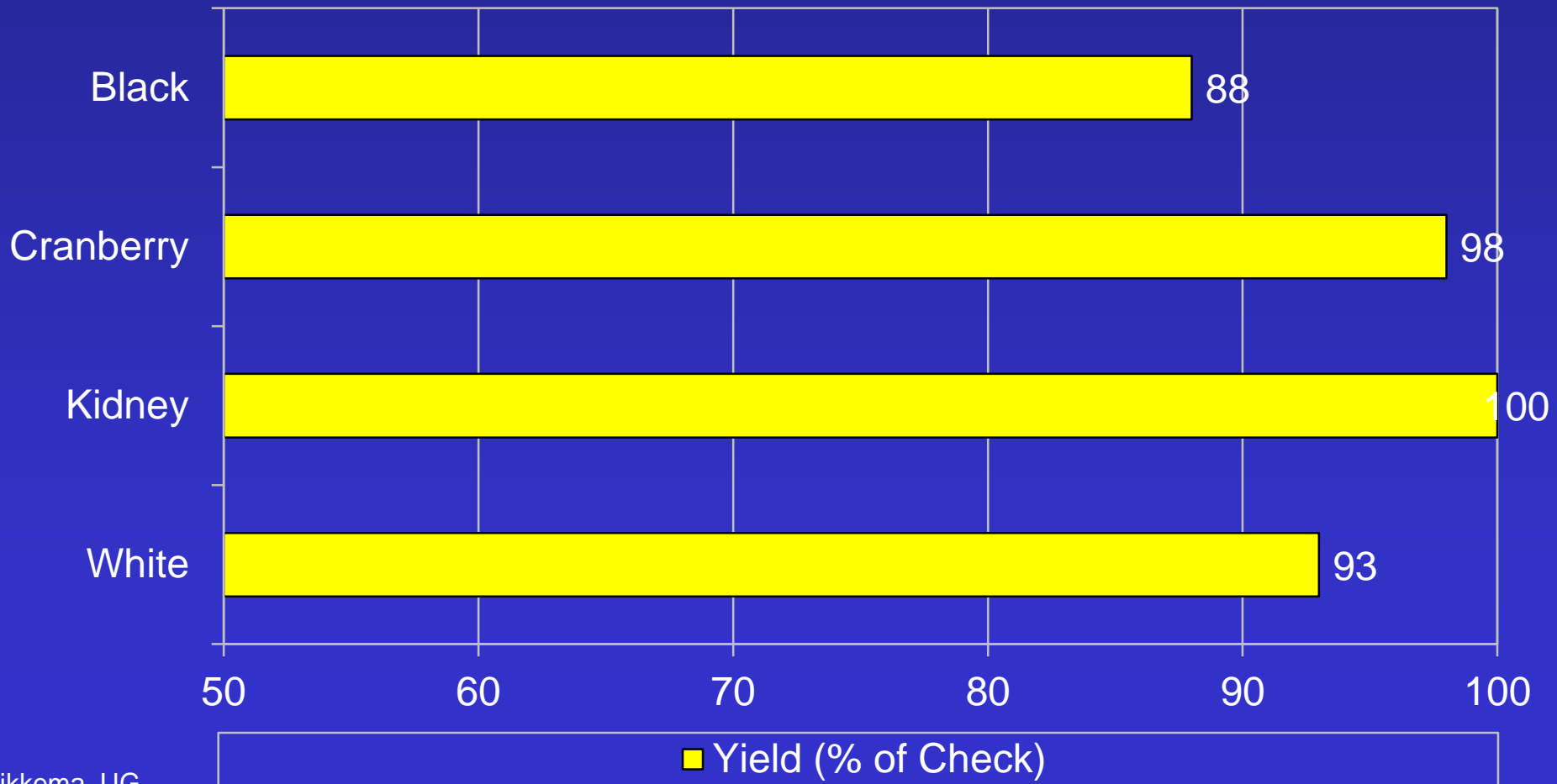


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Frontier Injury

# Dry Beans

## Dual (700 mL/ac) - PPI - Yield



# Dry Beans

## Question # 1

There are 4 soil applied grass herbicides (Dual, Eptam, Frontier and Treflan). Which one should I use?



Treflan



Frontier



# Soil Applied Annual Grass Herbicides

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## Recommendation

1. I think Treflan should be considered first
  - a. Low cost
  - b. Safe
  - c. Excellent grass control
  - d. Broadleaf weed suppression

# Soil Applied Annual Grass Herbicides

## Recommendation

1. The other three herbicides have a place
  - a. Dual & Frontier
    - i. PPI or PRE (PPI is safer)
    - ii. Dual is safer than Frontier
    - iii. Improved nightshade and nutsedge control
    - iv. Can be used in reduced tillage systems – PRE
  - b. Eptam
    - i. Costly, must be applied PPI
    - ii. More suppression of small seeded broadleaf weeds

# Dry Beans

## Question # 2

Do you recommend the same soil applied annual grass herbicide on adzuki beans?



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Adzuki Bean

# Adzuki Beans



Control

## Question # 2

Do you recommend the same soil applied annual grass herbicide on adzuki beans?

No

Treflan is the safest (followed by Dual)

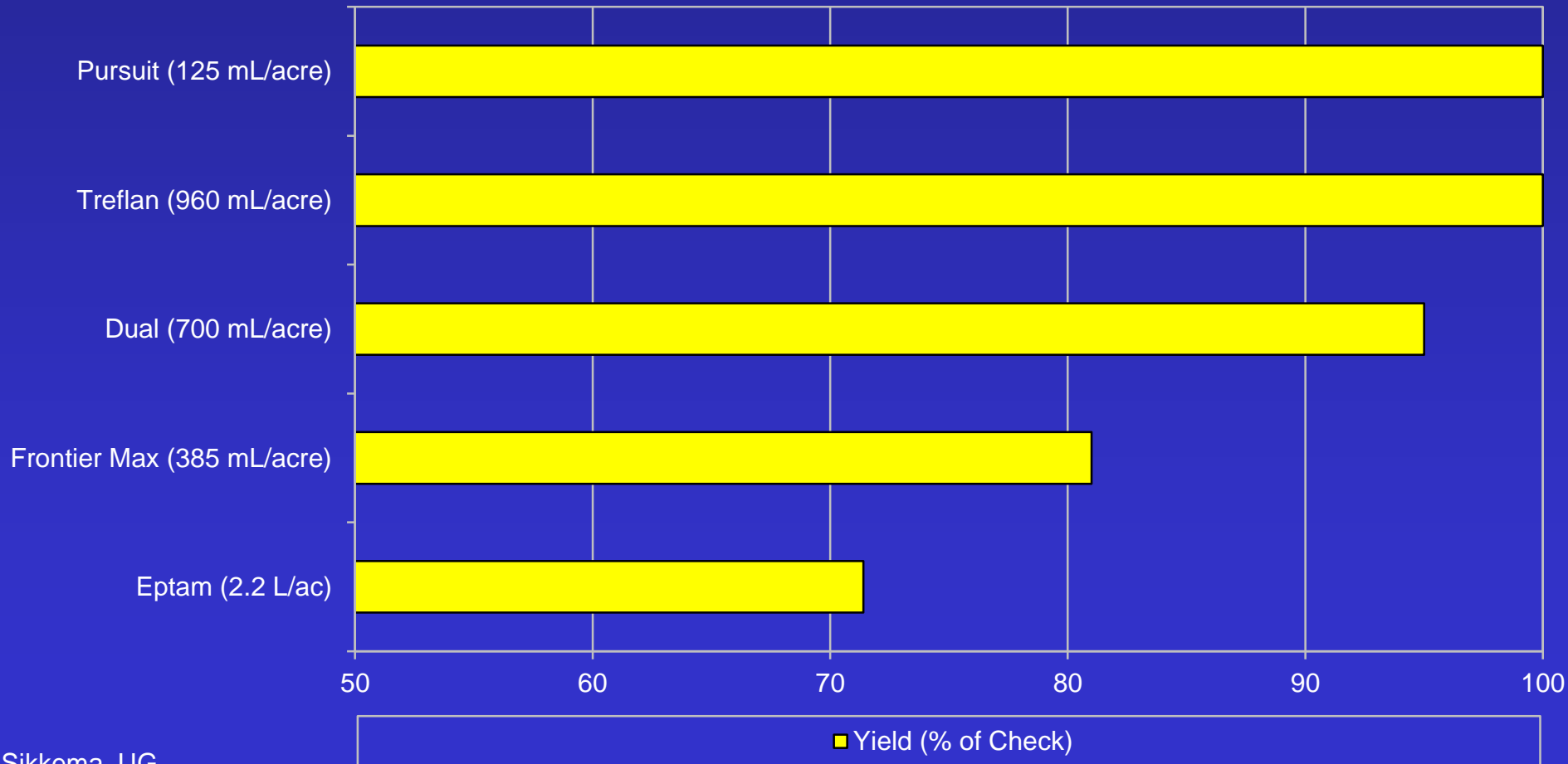
There is the potential for injury with Frontier and Eptam



Eptam on adzuki beans

# Adzuki Beans

## PPI Herbicides – 6 studies



# Adzuki Beans Preplant Incorporated



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Control



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Dual



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Eptam

# Dry Beans

## Question # 3

Should I add Pursuit  
to my soil applied  
grass herbicide?

If yes, what rate  
should I use?



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Pursuit (125 mL/ac)

# Pursuit

## General Comments

1. Apply PPI or PRE
2. Fair crop tolerance
  - a. Registered on all market classes
  - b. Registered on adzuki beans
3. Tankmixes
  - a. Dual & Frontier
    - i. PPI & PRE - all dry beans
  - b. Treflan
    - i. PPI - white beans



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Pursuit (125 mL/ac)



# Pursuit

## General Comments

1. Excellent broadleaf weed control
  - a. Inconsistent on common ragweed and lamb's-quarters
2. Good annual grass control
  - a. Poor control of tufted love and stink grass
3. No control of Group 2 resistant weeds
4. Excellent residual activity
  - a. 100 days to plant winter wheat
  - b. Severe re-cropping restrictions
5. Possibility for crop injury



Weed control in white bean with Pursuit

# Pursuit

## Disadvantages

1. Narrow margin of crop safety
  - a. Red to purple veins on lower side of leaf
  - b. Yellow leaf margin
  - c. Crinkled leaves
  - d. Stunting
  - e. Delay in maturity
  - f. Reduced yield



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Stunting of white beans due to Pursuit

# Pursuit

## Increased potential for injury ...

1. Small seeded market classes of dry beans
  - a. Black, otebo, pinto, white
    - i. Adjust Pursuit rate depending on market class
2. Cold, wet conditions
3. Coarse textured soils that are low in organic matter
4. When the beans have begun to emerge

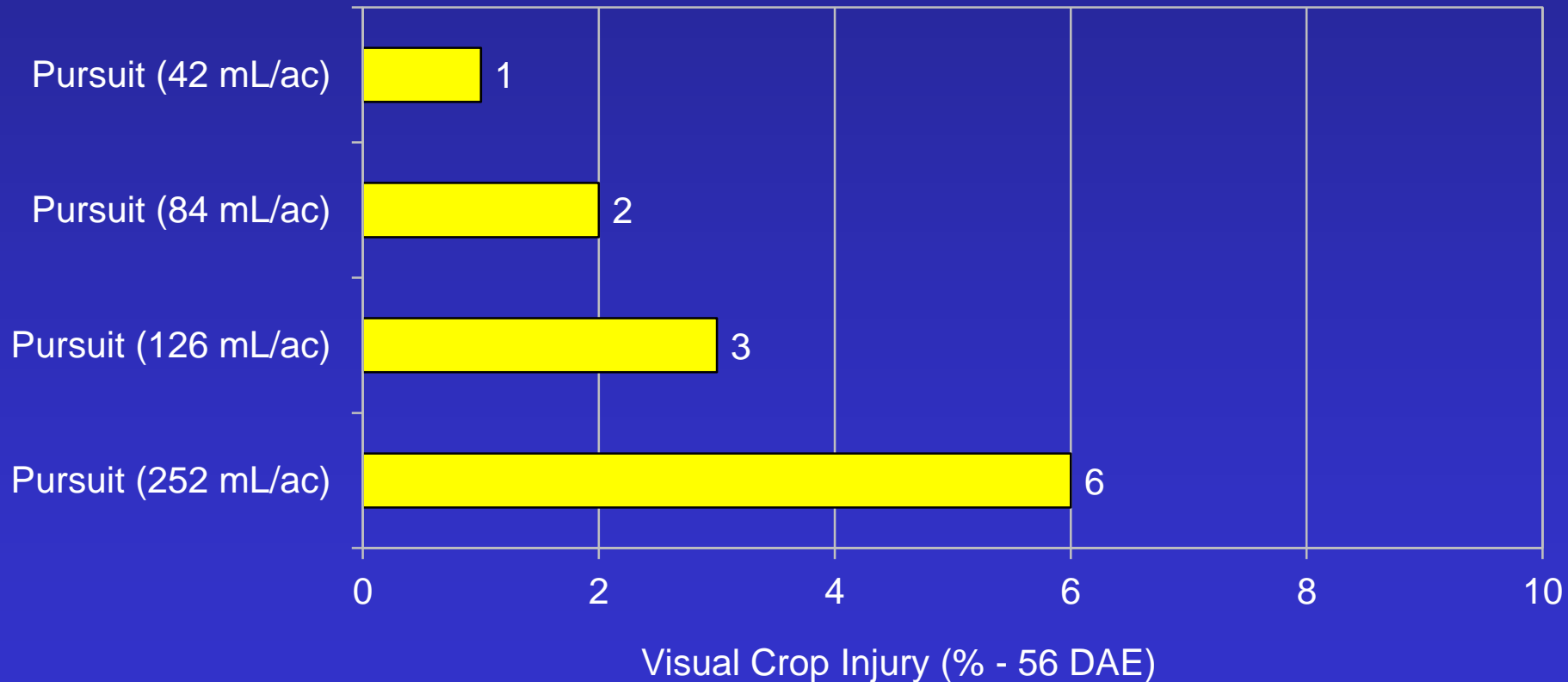


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Pursuit injury in white beans applied at cracking

# Pursuit

## White Bean - Injury

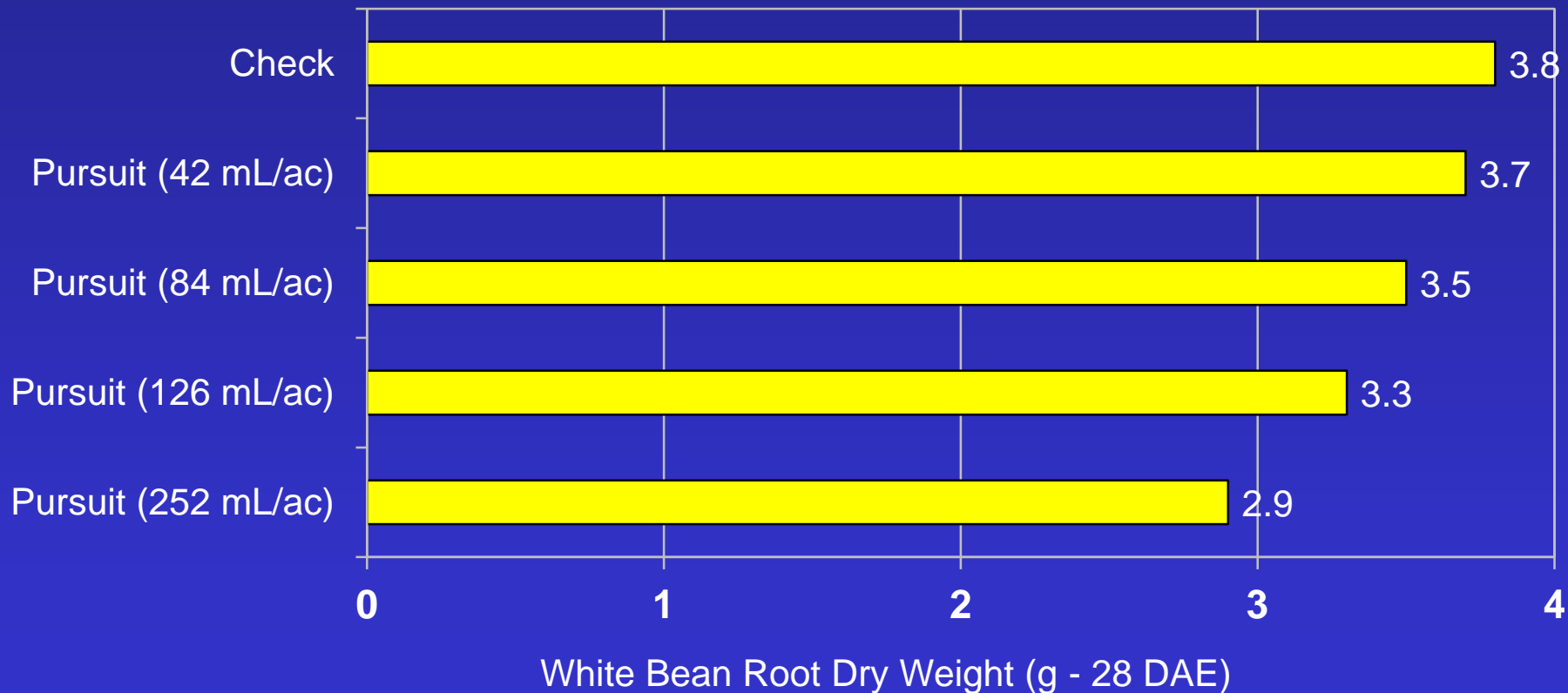


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■ Average of 12 Studies

# Pursuit Rate

13% decrease in white bean root dry weight



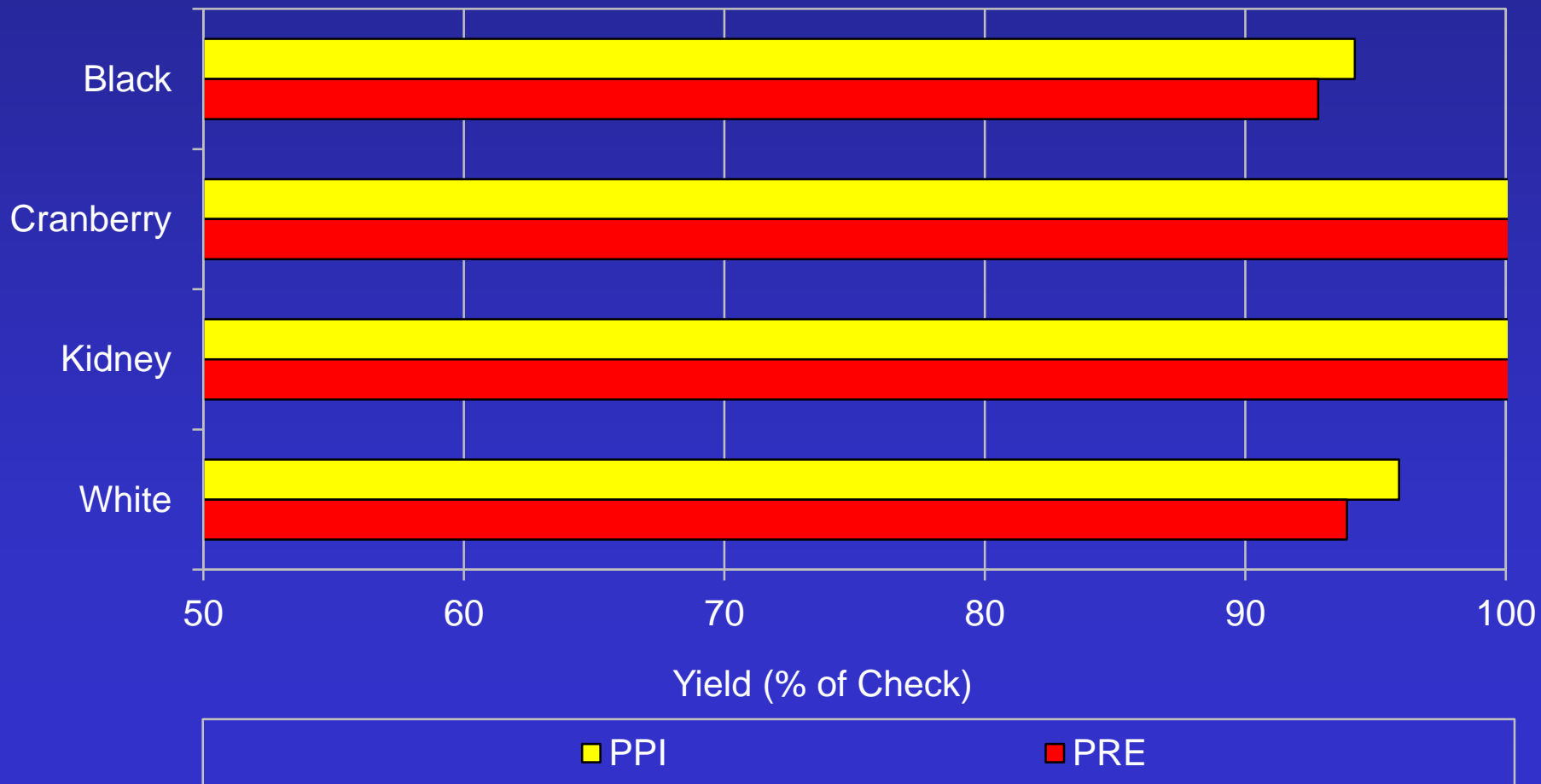
# Pursuit Rate

7% decrease in white bean yield



# Dry Beans

Dual (700 mL/ac) + Pursuit (126 mL/ac)



# Dry Beans

## Question # 3

Should I add Pursuit  
to my soil applied  
grass herbicide?

Yes



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Pursuit (125 mL/ac)



# Dry Beans

## Question # 3

What rate should I apply?

Depends on the market class ...

Small seeded - 75 mL/ac

Large seeded - 100 mL/ac

Adzuki beans - 125 mL/ac



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Pursuit (125 mL/ac)

# Dry Beans

## Question # 4

My beans have emerged and I noticed that I have some grass weed escapes. What are my options?



Proso millet control with Poast

# Dry Beans

## Annual Grass Control (Cost/Acre)

Treatment	Low Rate \$/Acre	High Rate \$/Acre
Select	10	13
Poast Ultra	11	34
Assure II	12	23
Excel Super	15	15

# Assure, Excel, Poast and Select

## Grass Control

1. Excellent control of emerged annual grasses
  - a. No residual activity
2. Application timing
  - a. 2-5 leaf stage and actively growing
3. Generally equivalent control of most grass species
  - a. Assure is better on
    - i. quack grass
    - ii. volunteer cereals and volunteer corn
    - iii. sandbur



Volunteer corn control with Assure

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# Assure, Excel, Poast and Select

## Control is reduced ...

1. When the grasses ...
  - a. Are past the five leaf stage
  - b. Have tillered
  - c. Emerge after application
2. During periods of drought
3. If rainfall occurs within 1 hour of application
4. If you forget to add the correct adjuvant



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Proso millet control with Poast

# Assure, Poast and Select

## Adjuvants

<u>Herbicide</u>	<u>Adjuvant</u>
Assure	Sure-Mix
Poast	Merge
Select	Amigo



Hamill, AAFC

Select

Select + Amigo

# Assure

## Injury

1. Injury is due to the adjuvant, not the herbicide
2. White to yellowish flecking of the leaves
3. Occurs with high temperature and humidity
4. Crop usually recovers with no impact on yield



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Assure Injury

# Dry Beans

## Question # 4

My beans have emerged and I noticed that I have some grass weed escapes. What are my options?

Assure, Excel, Poast or Select



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Proso millet control with Poast



# Dry Beans

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## Question # 5

My beans have emerged and I noticed that I have some broadleaf weed escapes.

Should I use Basagran or Reflex or tankmix the two?

# Dry Beans

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## Question # 5

My beans have emerged and I noticed that I have some broadleaf weed escapes.

Should I use Basagran, Reflex or tankmix the two?

## Answer

It depends on ...

- 1) Weed species present
- 2) Market class of beans

# Dry Beans

## Postemergence Broadleaf Weed Control (Cost/Acre)

<b>Treatment</b>	<b>Low Rate \$/Acre</b>	<b>High Rate \$/Acre</b>
Basagran Forte	20	26
Reflex	19	19
Basagran + Reflex	34	34

# Basagran

## Advantages

1. POST control of some broadleaf weeds
2. Good crop tolerance
  - a. Rating of “G” in Guide
3. No recropping restrictions



Ragweed escapes with Basagran

# Basagran Forte

## Weed Control

<b>Strengths</b>	<b>Weaknesses</b>
<p>Cocklebur? Jimsonweed? Lamb's-quarters Lady's thumb Mustard species Velvetleaf</p> <p>Yellow nutsedge Canada thistle Field bindweed</p>	<p>Nightshade, Eastern black Pigweed species Ragweed, common Ragweed, giant</p>

# Basagran

## Disadvantages

1. Limited spectrum
2. Timing is critical
  - a. Large weeds may escape
3. Excellent coverage is essential
  - a. Use higher water carrier volume
4. No residual activity
  - a. Weeds emerging after application will not be controlled
5. Crop injury



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Basagran Injury

# Basagran

## Crop Injury

1. Leaves show yellowing, bronzing, speckling or burn
2. Injury may occur if beans are under stress due to ...
  - a. Hot and humid conditions
  - b. Previous herbicide injury
  - c. Cold or dry weather
  - d. Hail
3. Injury is usually transient with no effect on yield
4. Do not use on adzuki beans



Basagran Injury

# Basagran/Basagran Forte



**NEVER** apply  
Basagran  
to adzuki beans!



# Reflex

## Advantages

1. Good to excellent control of some broadleaf weeds
  - a. Short residual activity
2. Fair crop tolerance
  - a. Rating of “F” in Guide



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ALS resistant pigweed control with Reflex

# Reflex

## Weed Control

<b>Strengths</b>	<b>Weaknesses</b>
Buckwheat, wild Lady's thumb Nightshade, Eastern black? Pigweed species Ragweed, common Ragweed, giant? Mustards	Cocklebur Fleabane, Canada Lamb's-quarters Velvetleaf

# Relfex

## Disadvantages

1. Limited spectrum
2. Timing is critical
  - a. Large weeds may escape
3. Limited residual activity
4. Excellent coverage is essential
5. Crop injury

Lamb's-quarters



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Nightshade



Hamill, AAFC

Lamb's-quarters



Hamill, AAFC



Sikkema, UG



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# Reflex

## Crop Injury

1. Injury symptoms
  - a. Speckling, bronzing, burn of the leaves
  - b. Slight leaf crinkling may occur
2. Causes of injury
  - a. Hot and humid conditions
    - i. The leaf cuticle becomes thinner and the plant will absorb more than a normal amount of herbicide
  - b. Addition of spray additives
  - c. Above label rates
    - i. Spray overlaps in the field
3. Injury is usually transient with no effect on yield



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Reflex injury

# Dry Beans

## Question # 5 – Basagran or Reflex?

<b>Basagran Forte</b>	<b>Reflex</b>
<p>Beggarticks, nodding <u>Cocklebur</u> Fleabane, Canada Flower-of-an-hour Lady's thumb <u>Lamb's-quarters</u> <u>Mustard, wild</u> <u>Velvetleaf</u></p> <p>Bindweed, field Nutsedge, yellow Thistle, Canada</p>	<p>Buckwheat, wild Lettuce, prickly <u>Mustard, wild</u> <u>Nightshade, Eastern black</u> <u>Pigweed species</u> <u>Ragweed, common</u> Ragweed, giant <u>Waterhemp</u></p> <p>Horsetail, field Violet, field</p>

# Volunteer Adzuki Beans

## Question # 6

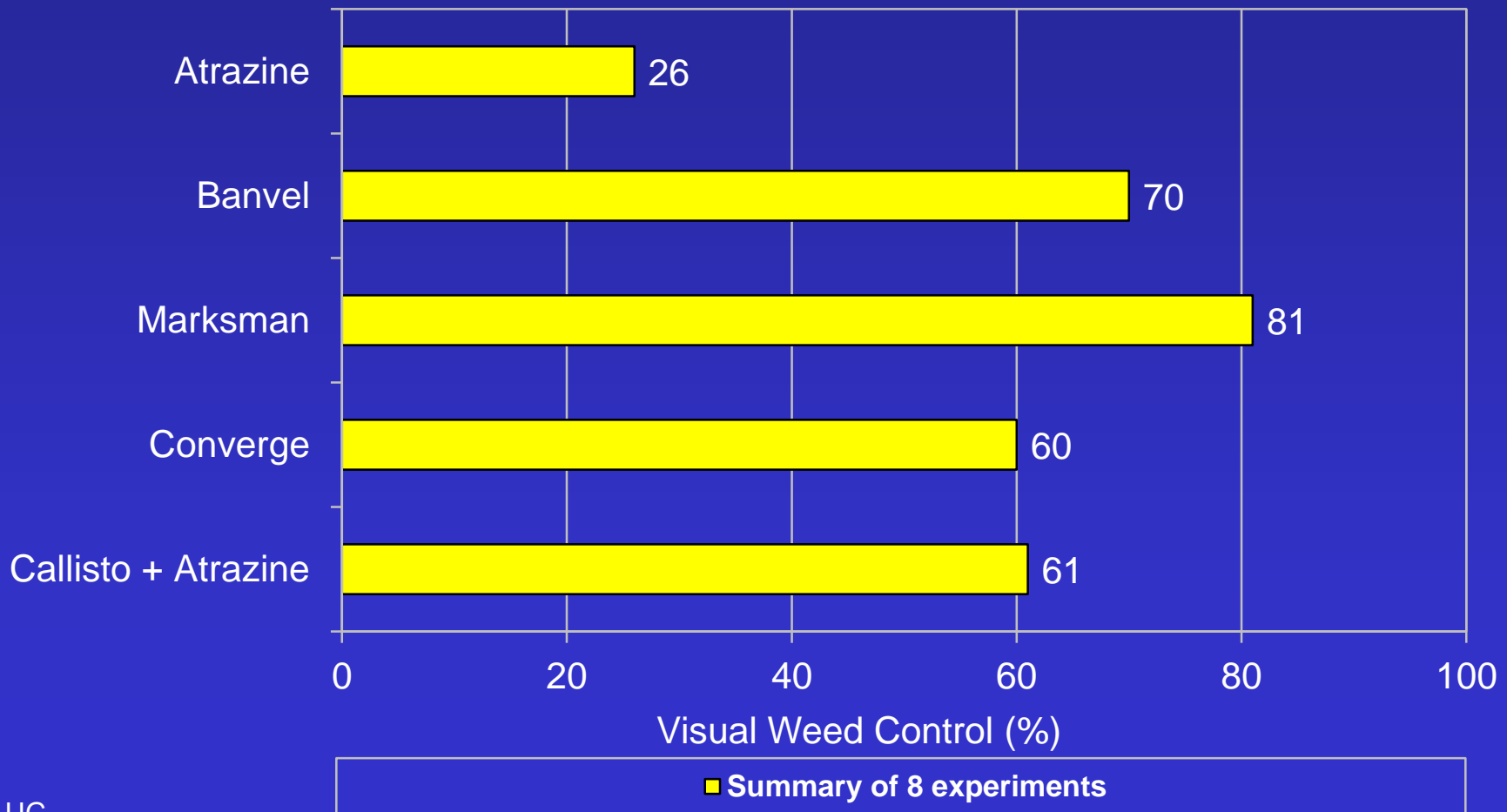
I have heard the statement “Once an adzuki bean grower – always an adzuki bean grower”. Is that true?



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# Volunteer Adzuki Beans

## Corn - Soil Applied Herbicides



# Volunteer Adzuki Beans – Corn PRE



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**Weedy Check**



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**Atrazine**



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**Banvel**



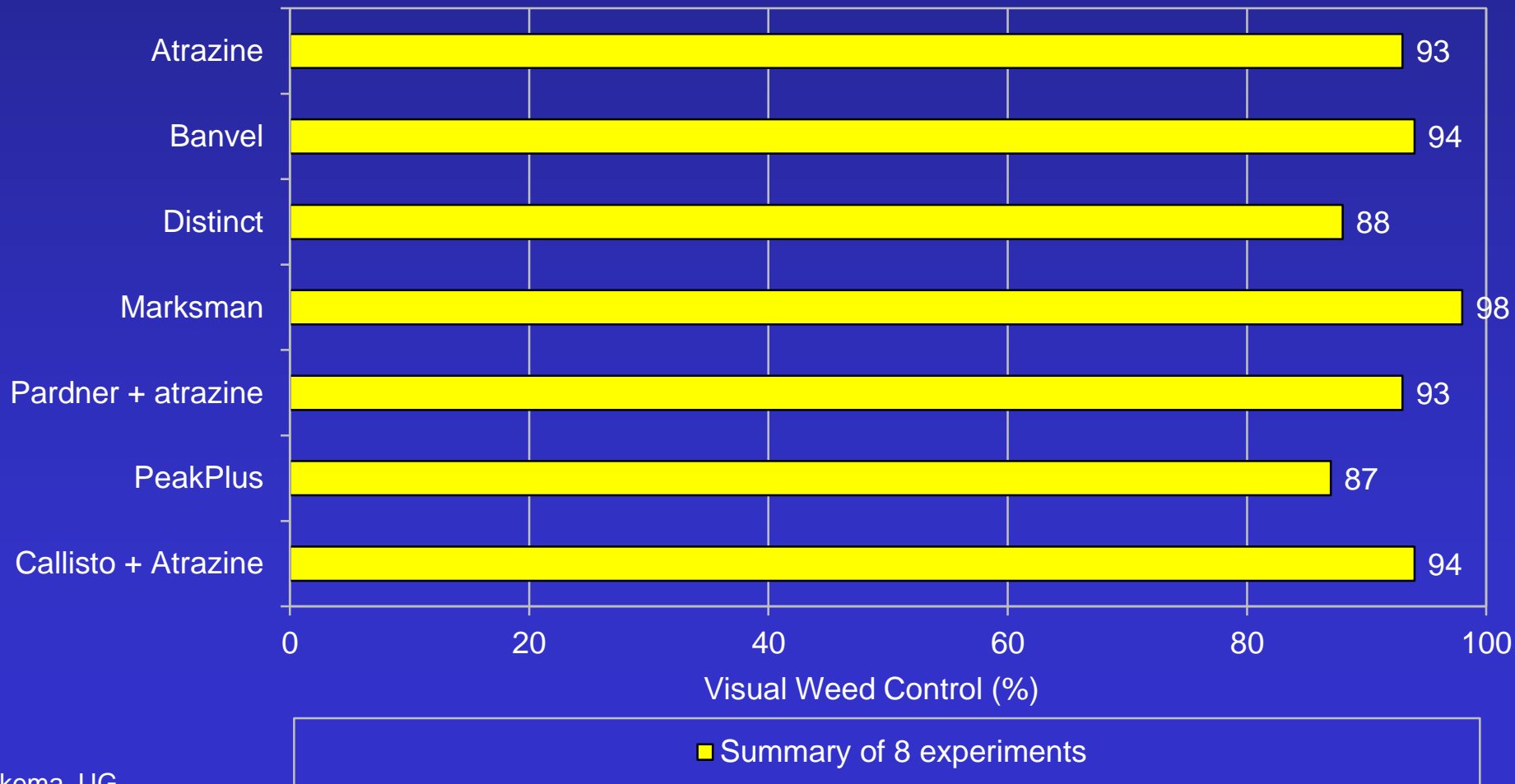
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**Marksman**



# Volunteer Adzuki Beans

## Corn - Postemergence Herbicides



# Volunteer Adzuki Beans – Corn POST



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**Weedy Check**



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**Atrazine**



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**Callisto + Atrazine**

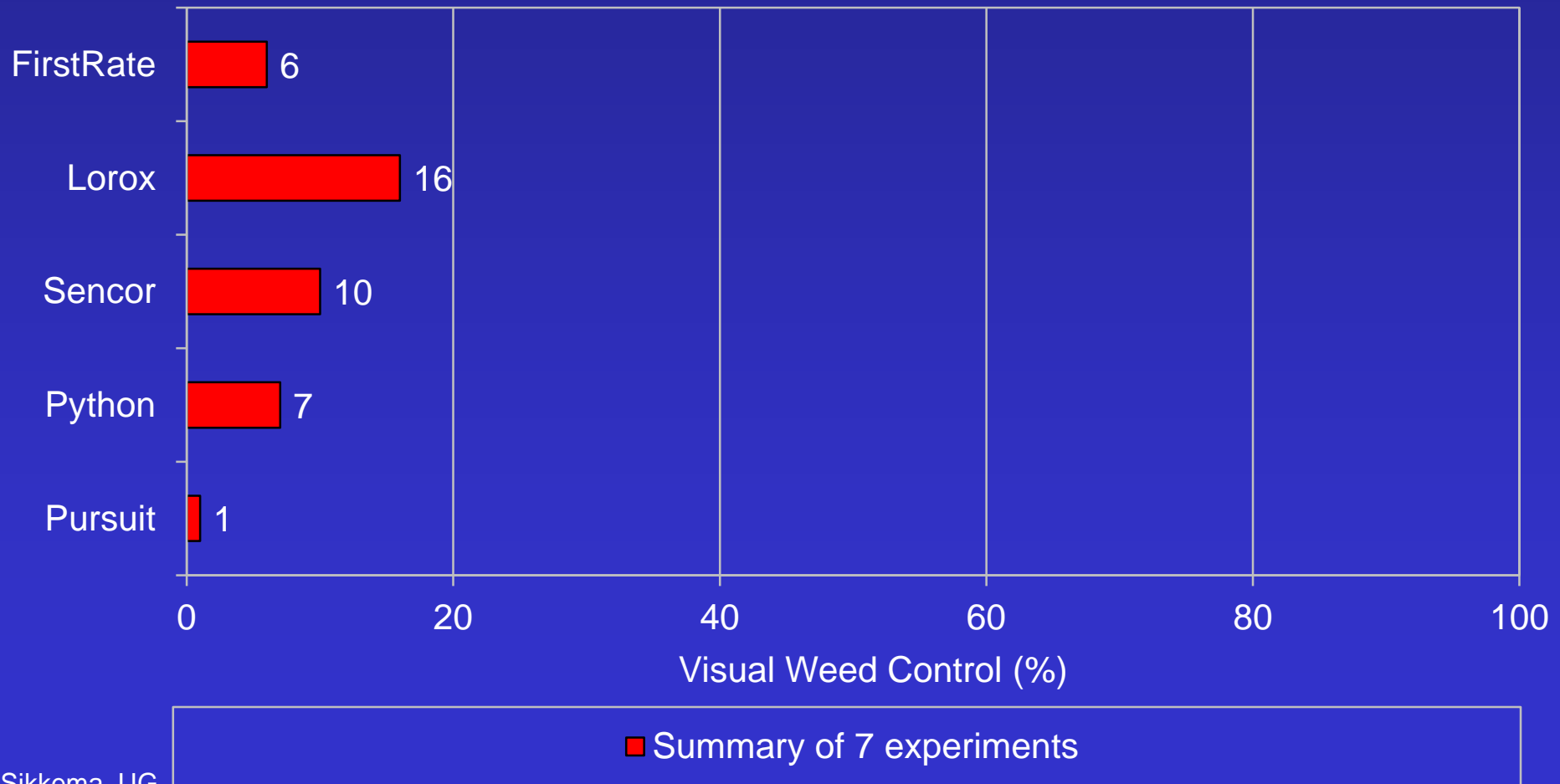


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**Marksman**

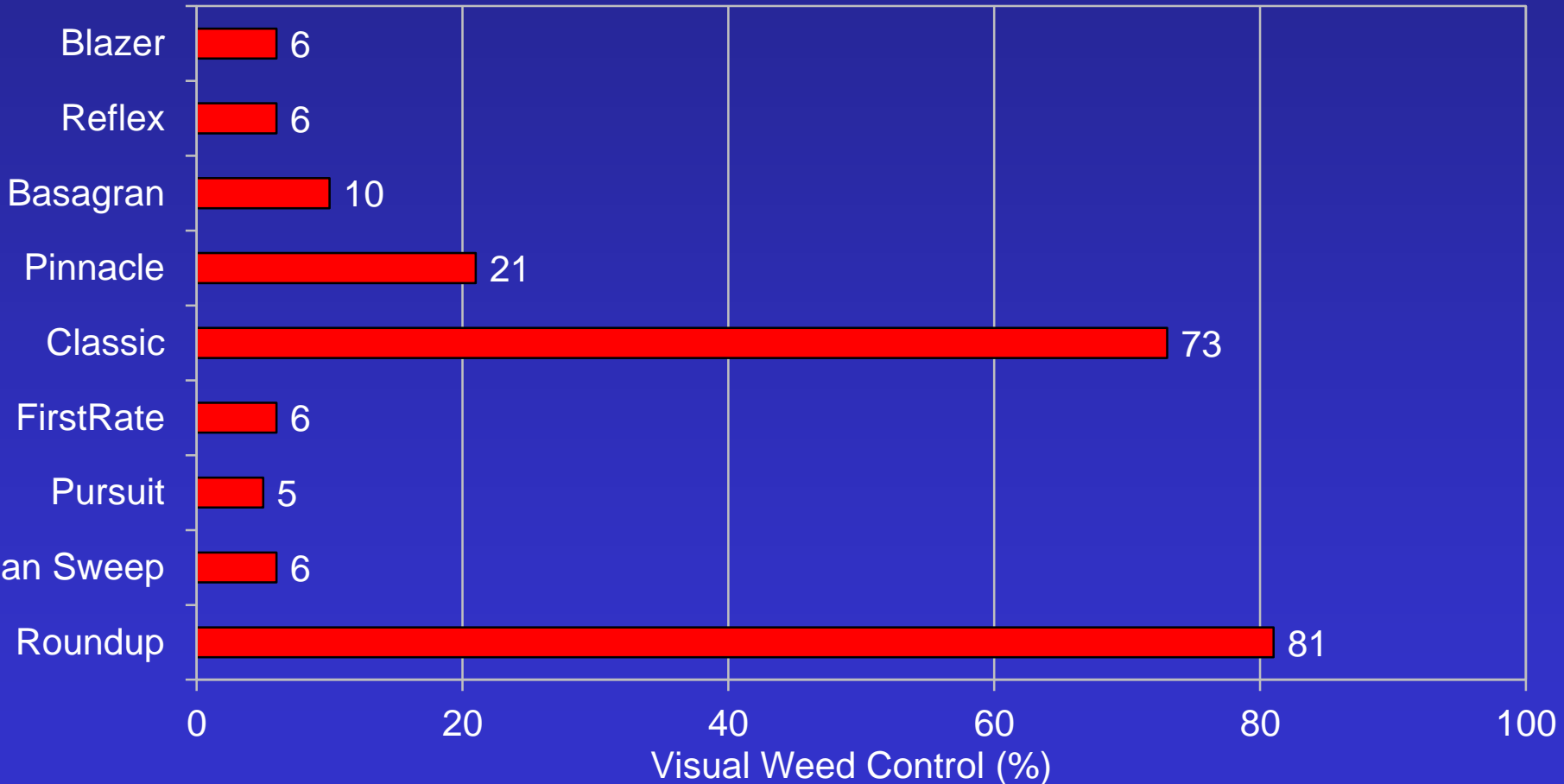
# Volunteer Adzuki Beans

## Soybeans - Soil Applied Herbicides



# Volunteer Adzuki Beans

## Soybeans - Postemergence Herbicides



■ Summary of 8 experiments

# Volunteer Adzuki Beans



Classic



Reflex

# Volunteer Adzuki Beans

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## Question # 6

I have heard the statement “Once an adzuki bean grower – always an adzuki bean grower”. Is that true?

## Answer

Adzuki beans do volunteer.

Marksman PRE provides good control in corn.

Most POST herbicides in corn have good activity.

Classic (IP soybean) and Roundup (Roundup Ready soybean) POST provide good control.

# Dry Beans

## Summary

1. Weed management in dry beans must be divided into at least three groups
  - a. adzuki beans
  - b. black, otebo, pinto and white beans
  - c. brown, cranberry, kidney and yellow eye beans
2. Start with a soil applied weed control program
3. Treflan (500 mL/ac) + Pursuit (75, 100 or 125 mL/ac) is a good foundation
  - a. Adjust the rate of Pursuit depending on market class



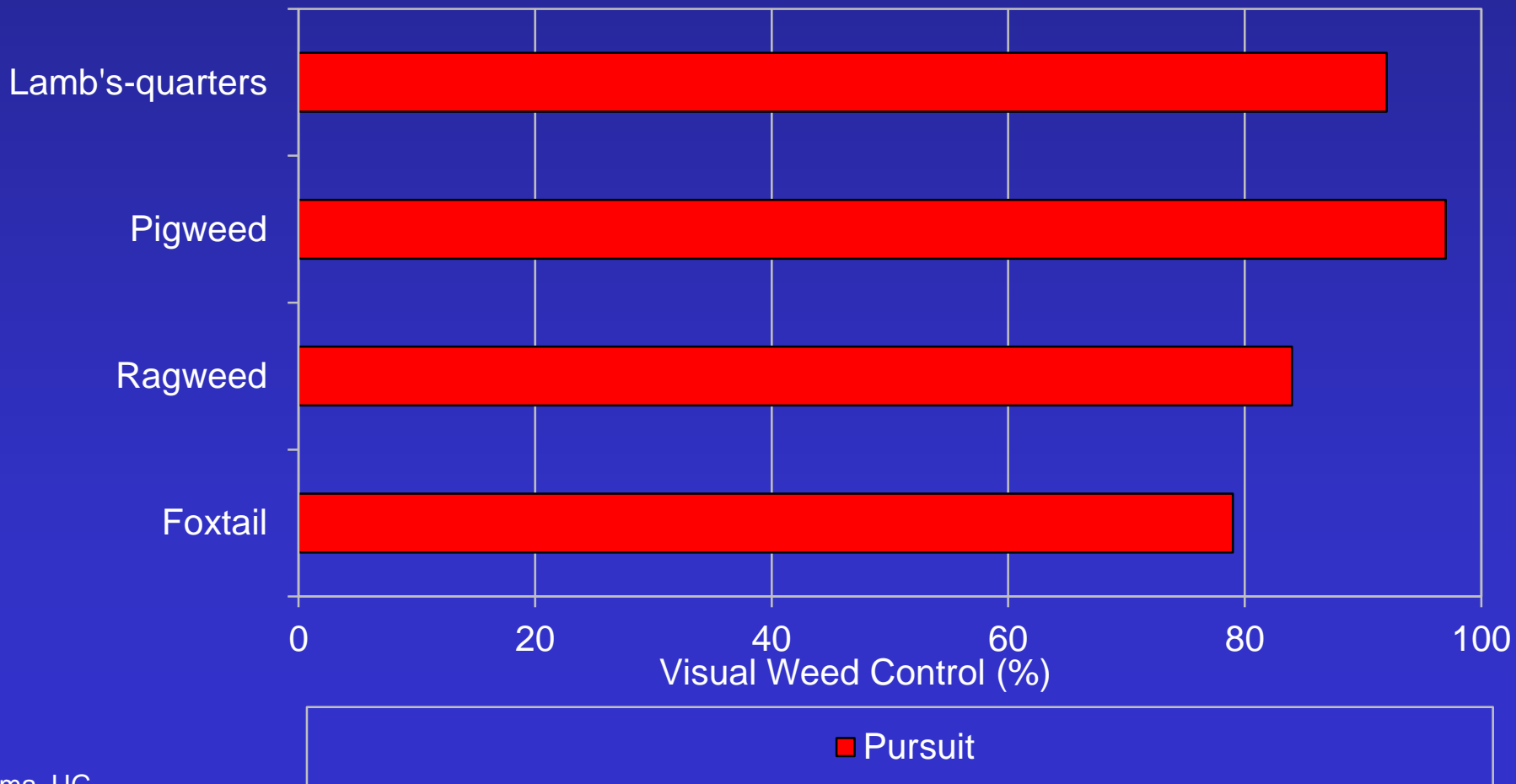
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Pursuit + Treflan



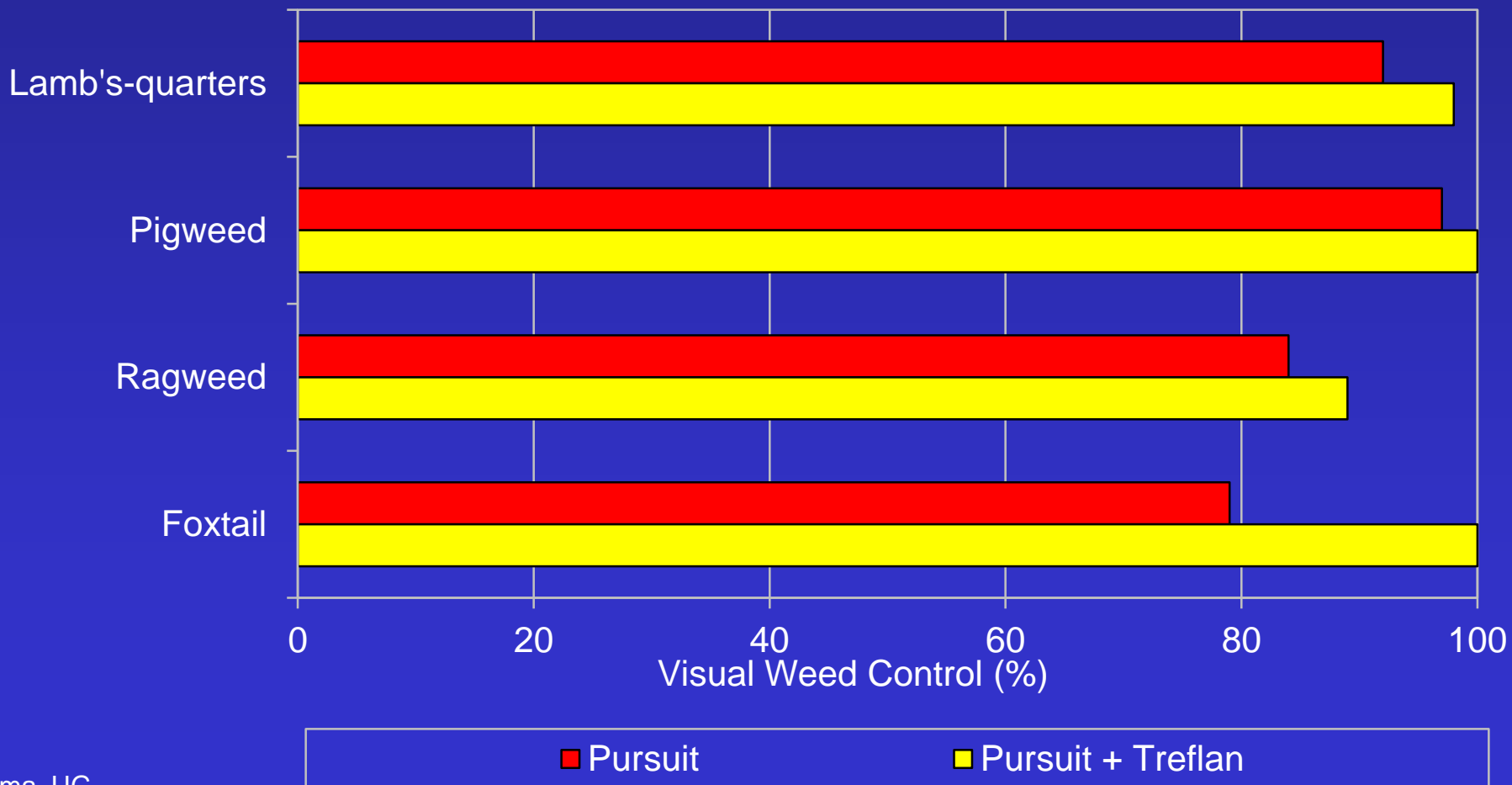
# Treflan (500 mL/ac) + Pursuit (75 mL/ac)

## Weed Control



# Treflan (500 mL/ac) + Pursuit (75 mL/ac)

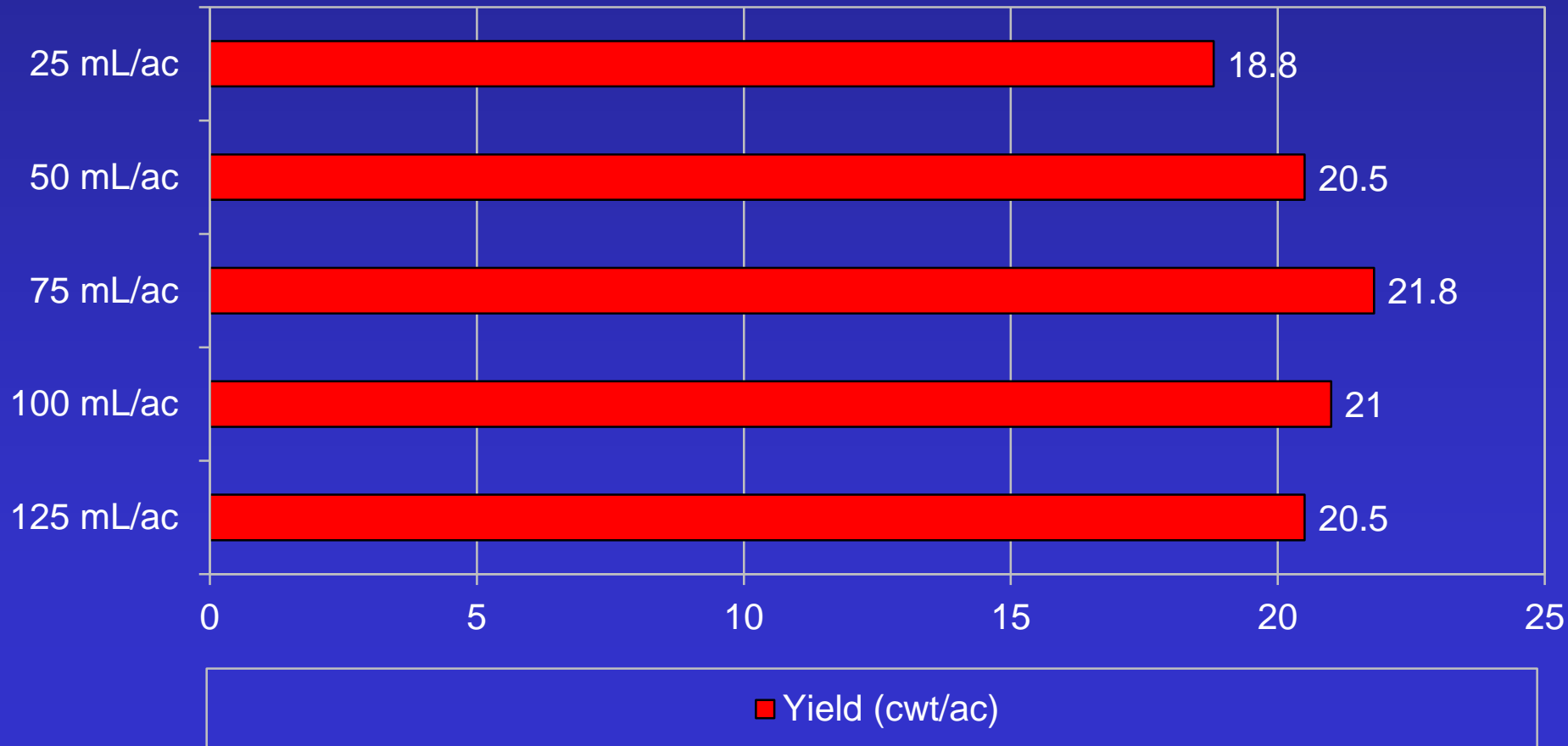
## Weed Control



# Treflan (500 mL/ac) + Pursuit (PPI)

## White Beans

Pursuit Rate



# Dry Beans

## Summary

4. The other grass herbicides
  - a. Dual is safer than Frontier
  - b. Dual and Frontier are safer PPI than PRE
  - c. Eptam, Dual and Frontier should be used to address specific weeds
5. Control grass escapes with Assure, Excel, Poast or Select
6. Control broadleaf escapes with Basagran or Reflex
7. You may need to consider using cultivation

# Dry Beans

## Adzuki Beans

PPI	<u>Treflan (500 mL/ac) + Pursuit (125 mL/ac)</u>
PRE	Pursuit (125 mL/ac)
POST	<u>Assure (150 mL/ac) or Poast (130 mL/ac)</u> <u>Reflex (400 mL/ac)</u>

# Thank You

Todd Cowan & Christy Shropshire

Herbicide Manufacturers

Ontario Coloured Bean Growers'  
Association

Ontario White Bean Producers

Agriculture and Agri-Food Canada

Agricultural Adaptation Council



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