

Forty years of kochia (*Bassia scoparia*) control with herbicides in sugar beet

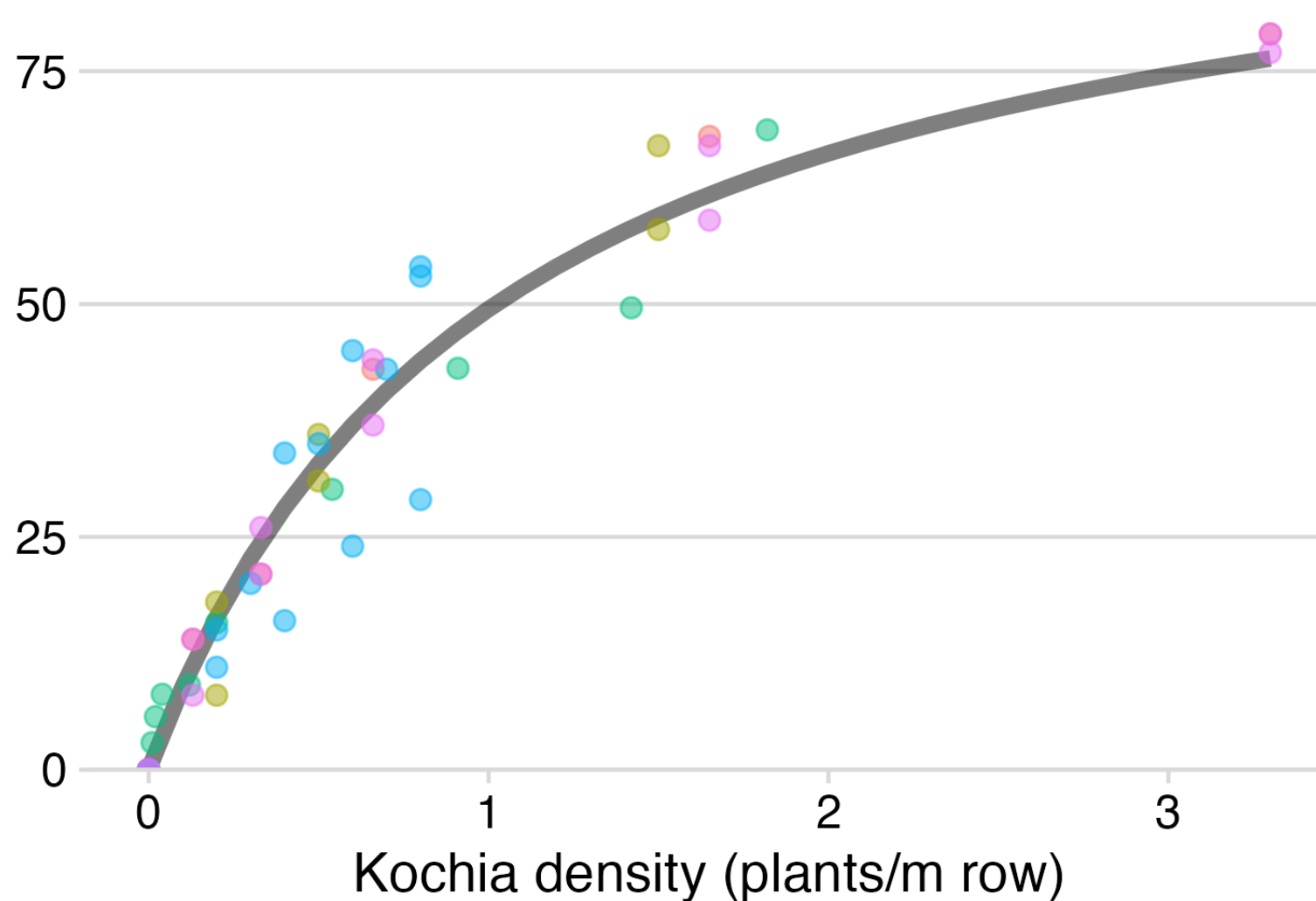


Andrew Kniss



10 kochia per 100' of row = 25% yield loss

Sugarbeet yield loss (%)



Study

- Dotzenko and Arp (1971)
- Mesbah et al. (1994)
- Schweizer (1973)
- Schweizer (1981)
- Weatherspoon and Schweizer (1971)

Kochia management in sugarbeet



Bob Wilson (UNL)



Steve Miller (UW)

Kochia control with POST herbicides

- 🐎 Efficacy data from year-end written reports:
 - Bob Wilson, UNL – 1984 through 1996
 - Steve Miller, UW – 1985 through 1996

Questions:

- ❧ Is kochia control inversely related to sugarbeet injury?
- ❧ What is the effect of:
 - Herbicide rate?
 - Herbicide timing?
 - Number of applications?
 - Tank-mixtures?
 - Adjuvants?
 - Sequential PRE + POST?



Kochia Efficacy Data, 1984-1996

Locations:

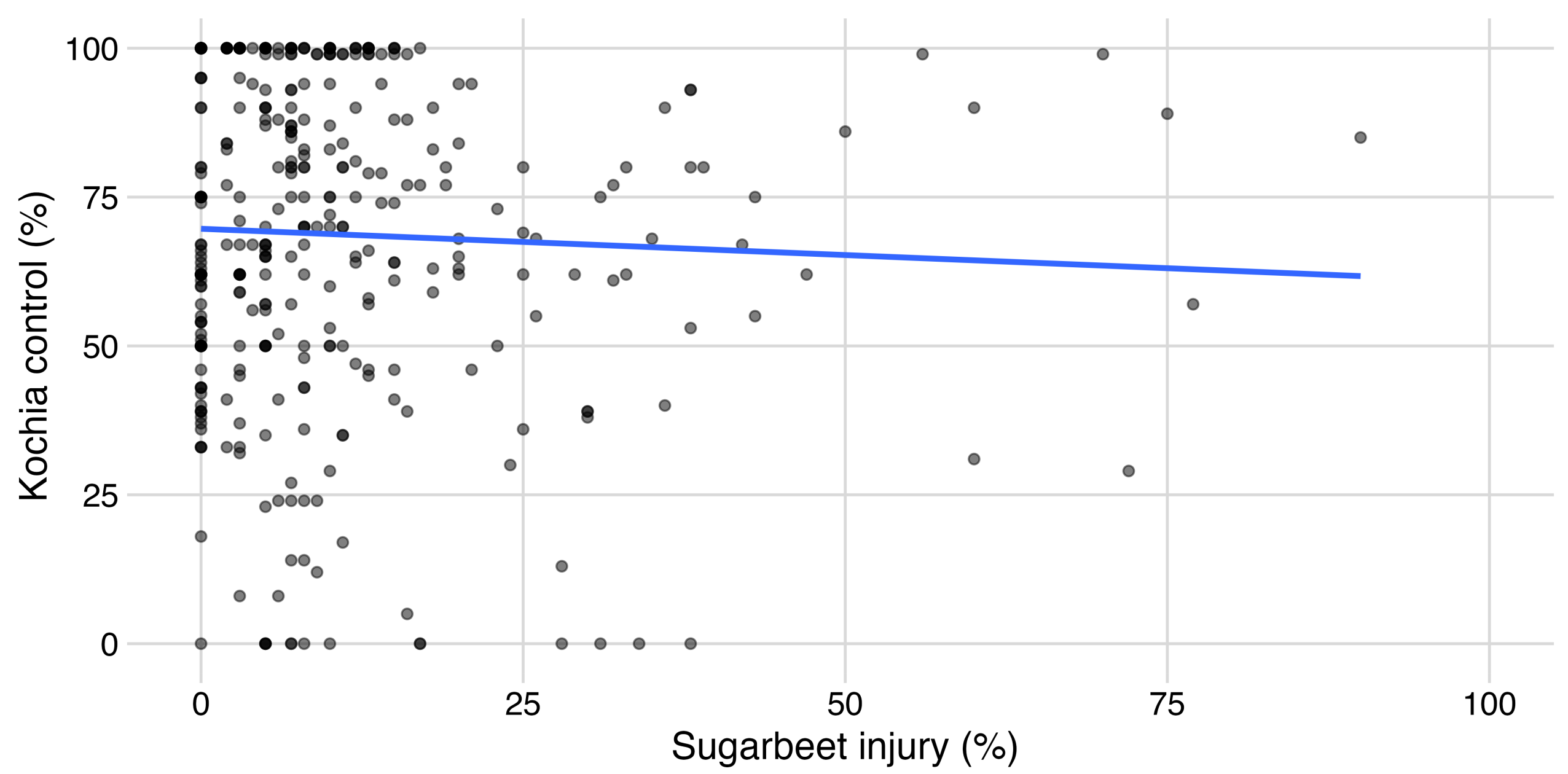
- Scottsbluff & Mitchell, NE
- Torrington & Powell, WY

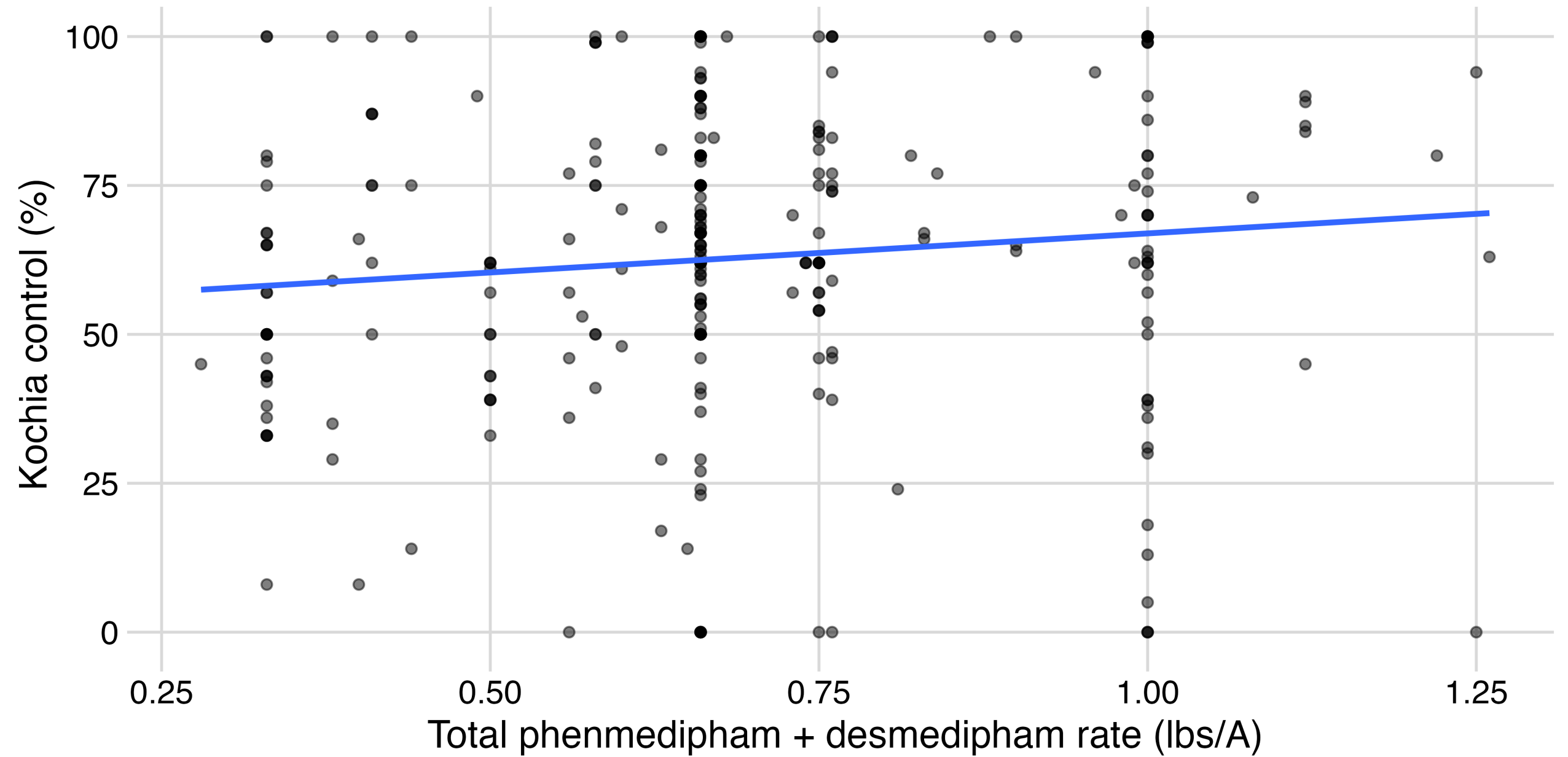
33 studies provided kochia efficacy data from POST herbicides

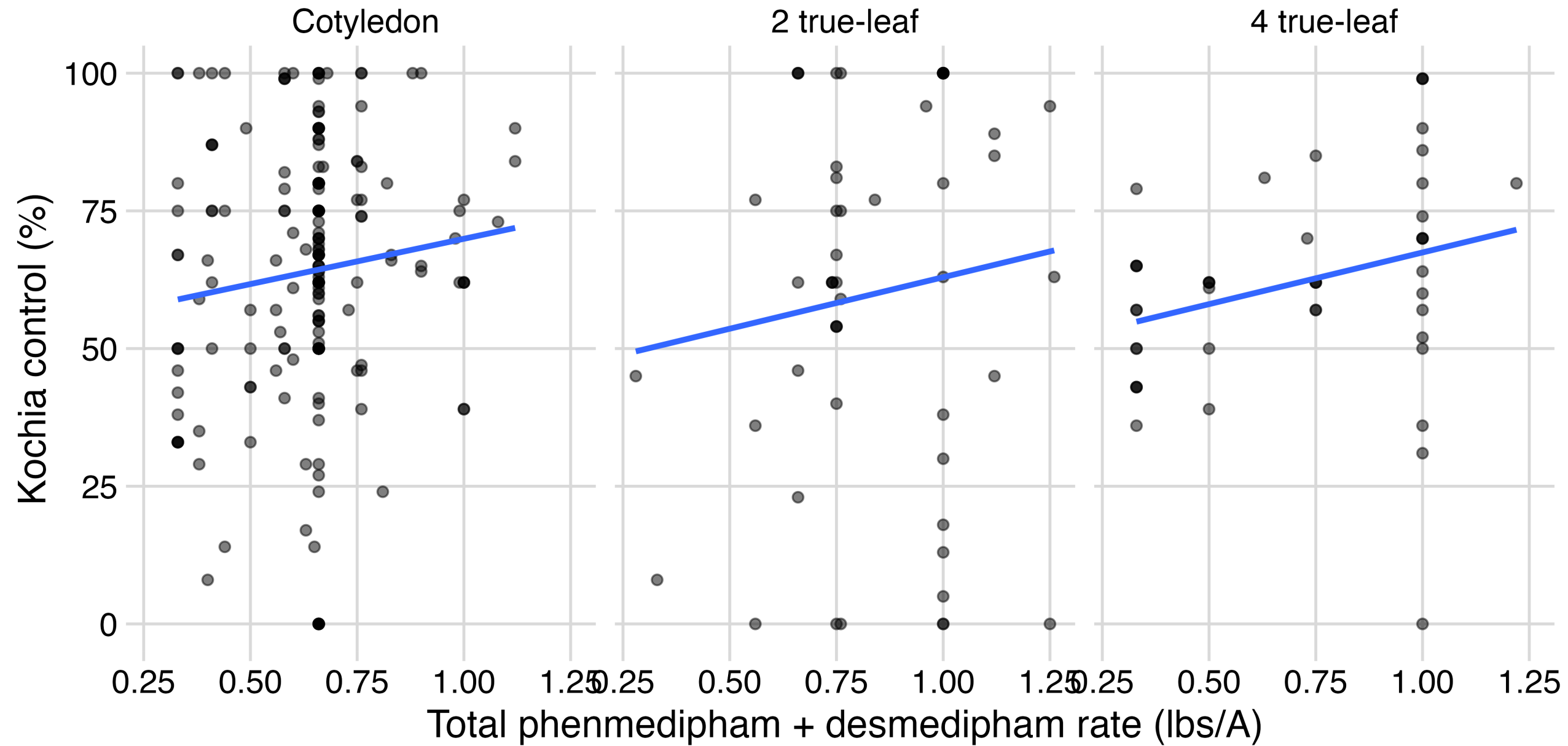
- 458 kochia efficacy observations
(each observation is mean of 3-4 replicates)

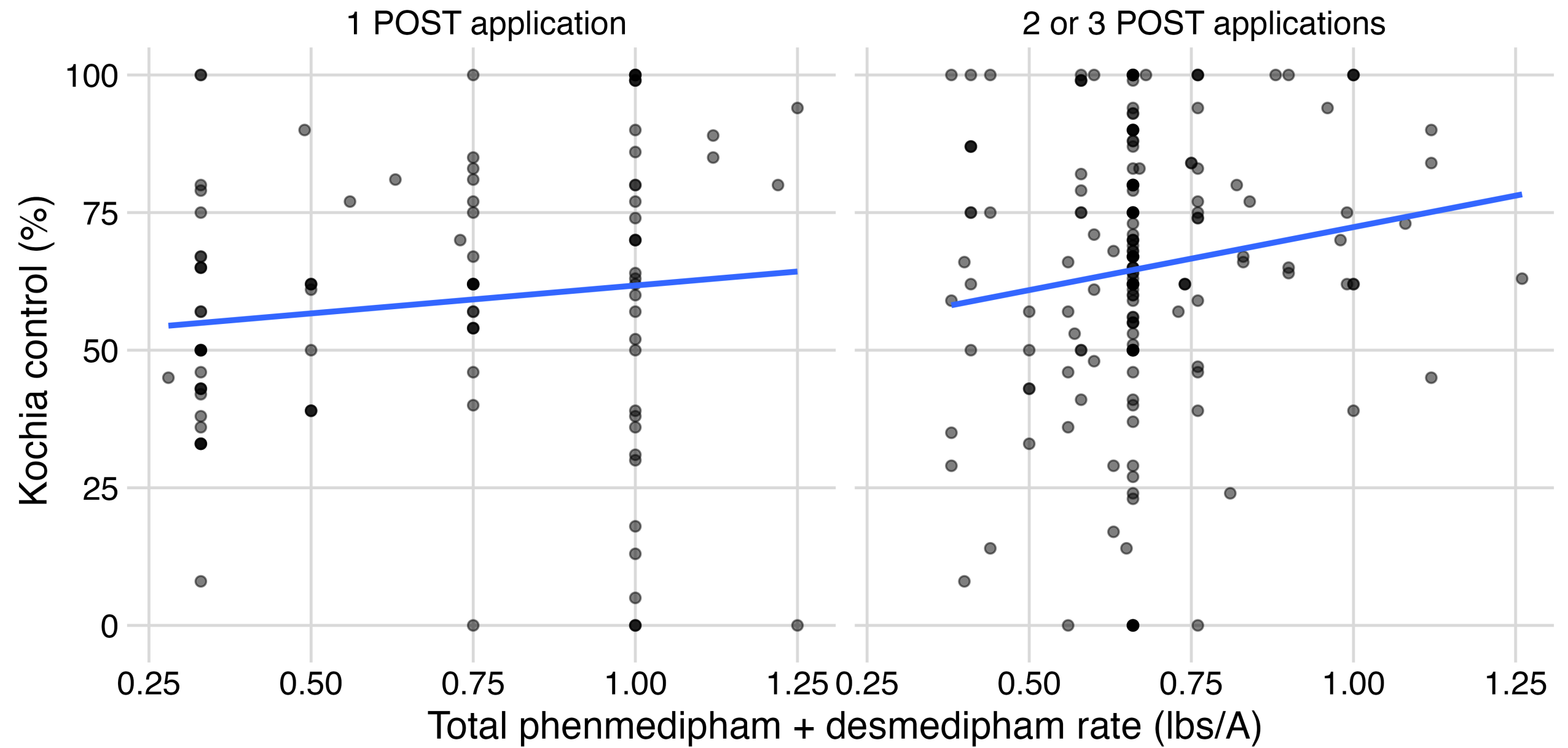
Kochia Efficacy Data, 1984-1996

- 🐎 72% of POST treatments included Betamix
 - phenmedipham + desmedipham
- 🐎 14% of POST treatments included Progress
 - phenmedipham + desmedipham + ethofumesate
- 🐎 29% of POST treatments included UpBeet
 - thifensulfuron

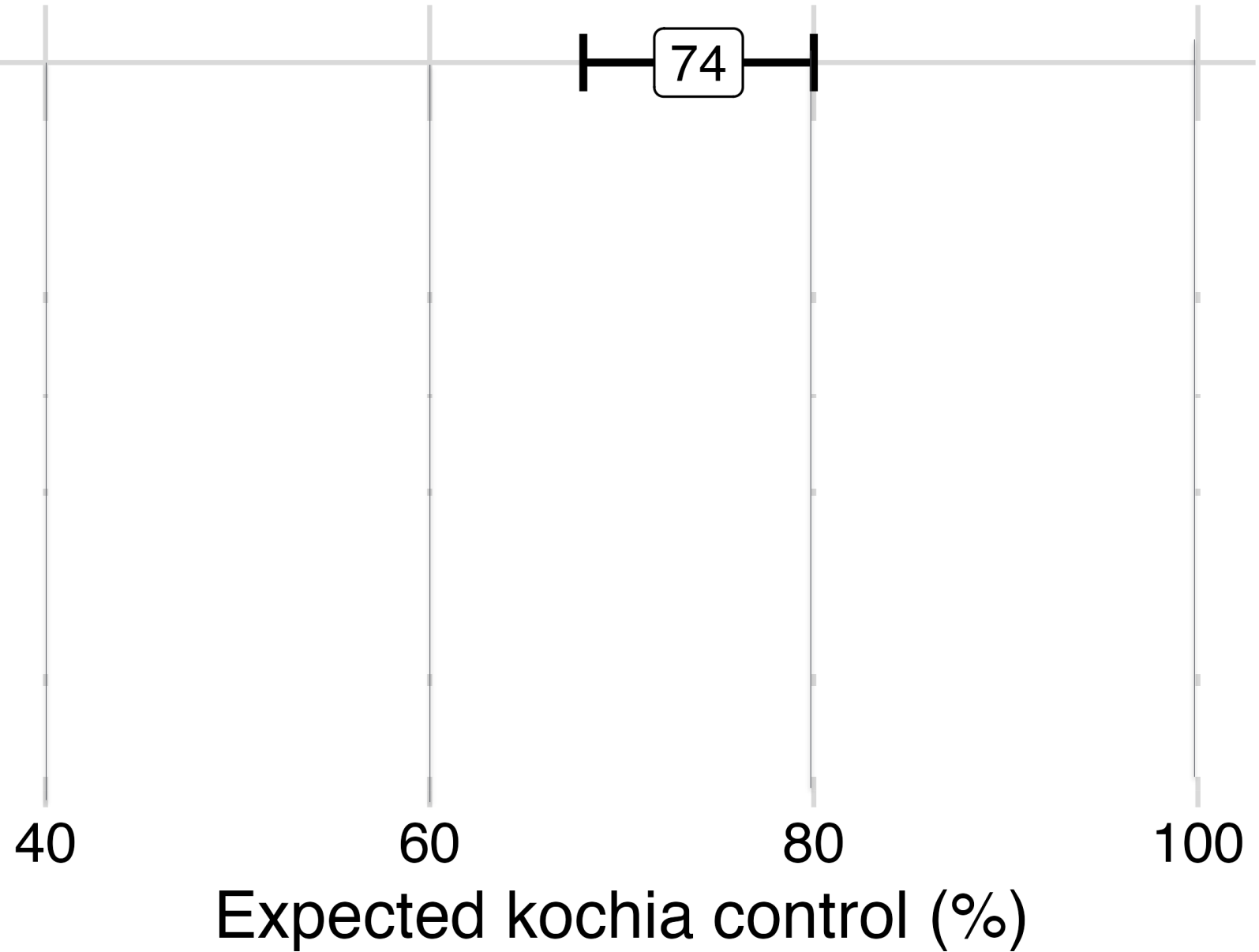


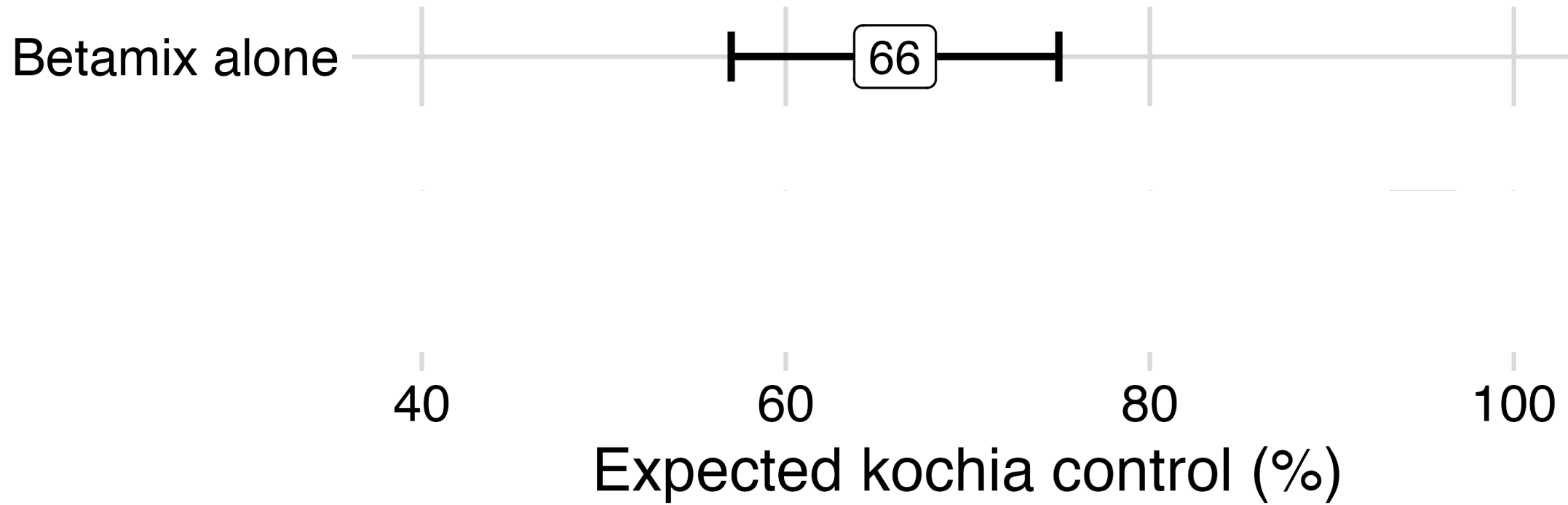






All POST treatments





- ✚ Nortron + glyphosate for weed control in RR sugarbeet
- ✚ Glyphosate-resistant kochia control in corn-sugarbeet rotations
- ✚ Command (clomazone) herbicide for PRE weed control at sugarbeet planting
- ✚ Maximizing the efficacy of Nortron (ethofumesate) applied POST
- ✚ Investigating pre-plant burndown herbicide options in sugarbeet
- ✚ Influence of Proline plus glyphosate mixtures for kochia control
- ✚ Decision aid to reduce selection for herbicide resistant weeds
- ✚ Metamitron for sugarbeet safety and weed control efficacy
- ✚ Ultra Blazer herbicide in sugarbeet
- ✚ Metamitron under different irrigation systems
- ✚ Cover crops for weed management in sugarbeet
- ✚ Soil applied herbicides for crop safety and weed control potential
- ✚ Corn herbicides that allow rotation to sugarbeet
- ✚ Stale seedbed approach to manage herbicide-resistant weeds

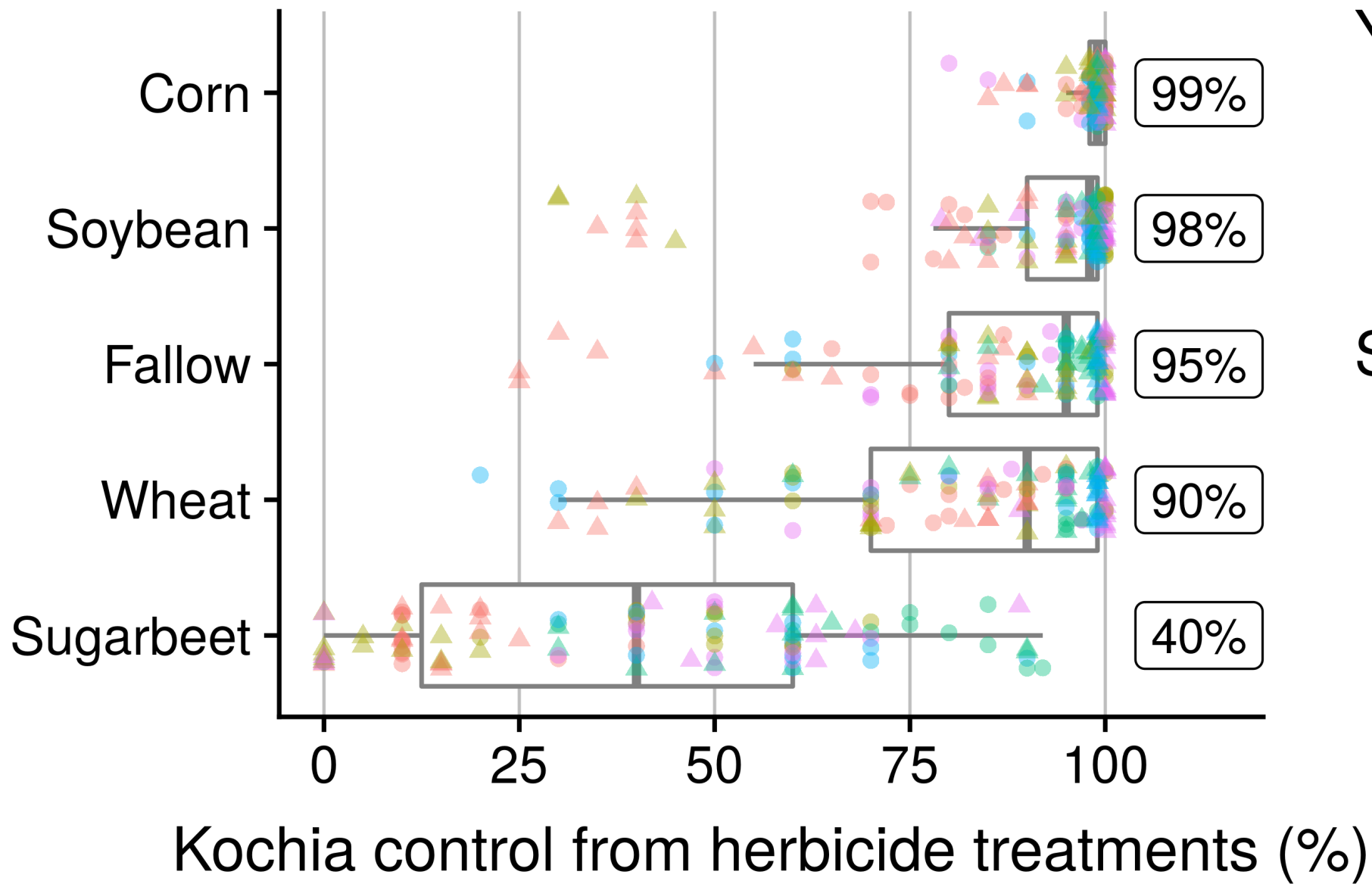
Old habits die hard...

Herbicide	Kochia control (%)
Betamix 24 fl oz + HSOC	
Betamix 48 fl oz + HSOC	
Betamix 96 fl oz + HSOC	

Old habits die hard...

Herbicide	Kochia control (%)
Betamix 24 fl oz + HSOC	5
Betamix 48 fl oz + HSOC	12
Betamix 96 fl oz + HSOC	10

... same for kochia



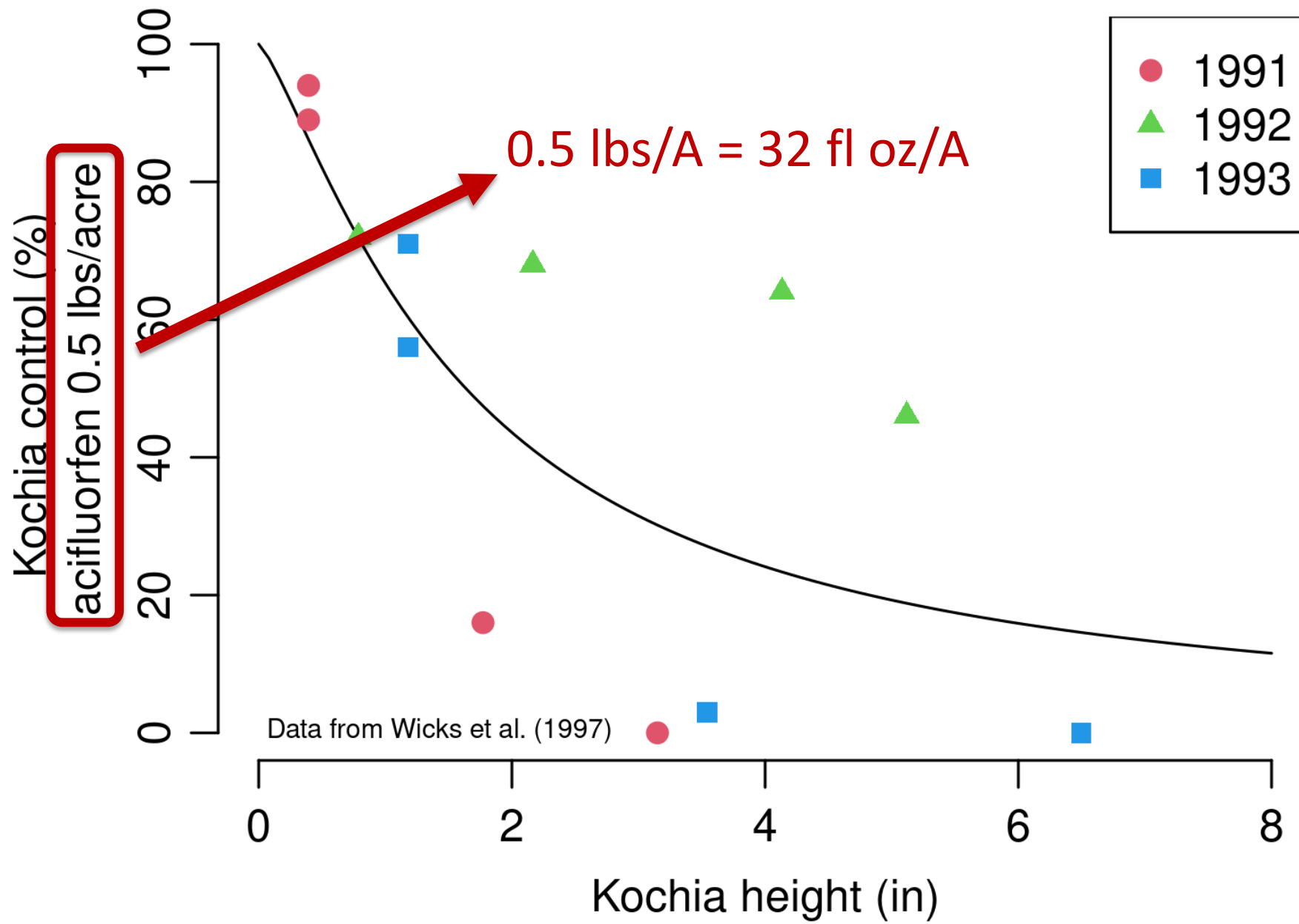
Pre-plant Burndown

~~Command:~~

- 2013: Looked very promising
- 2014: Looked ok, question about safety
- 2015: Killed lots of beets



Lingle, WY & Scottsbluff, NE



Ultra Blazer is unlikely to provide consistent kochia control after the sugarbeet 6 TL stage



Untreated control

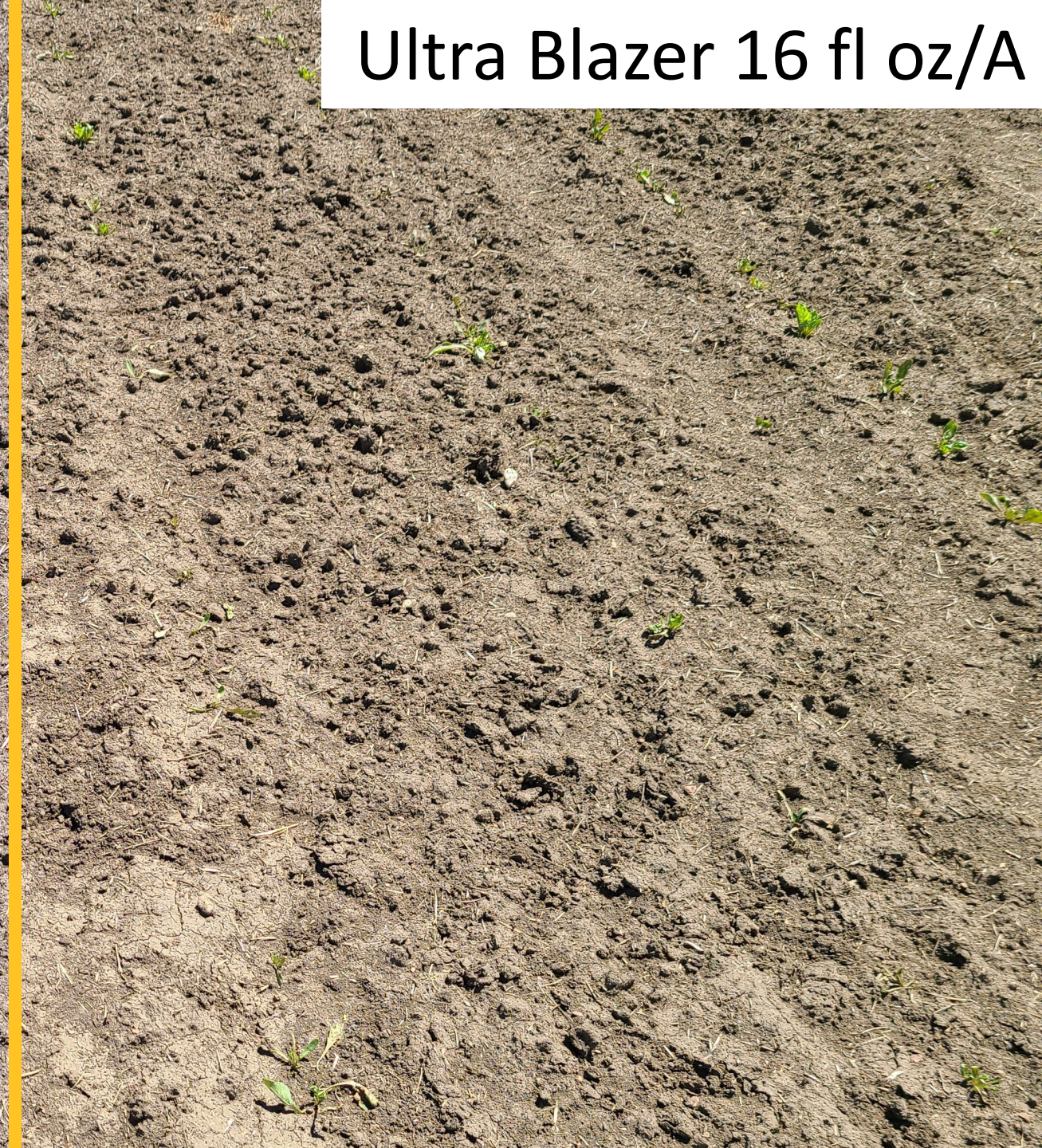
2021

Ultra Blazer 16 fl oz/A

2021

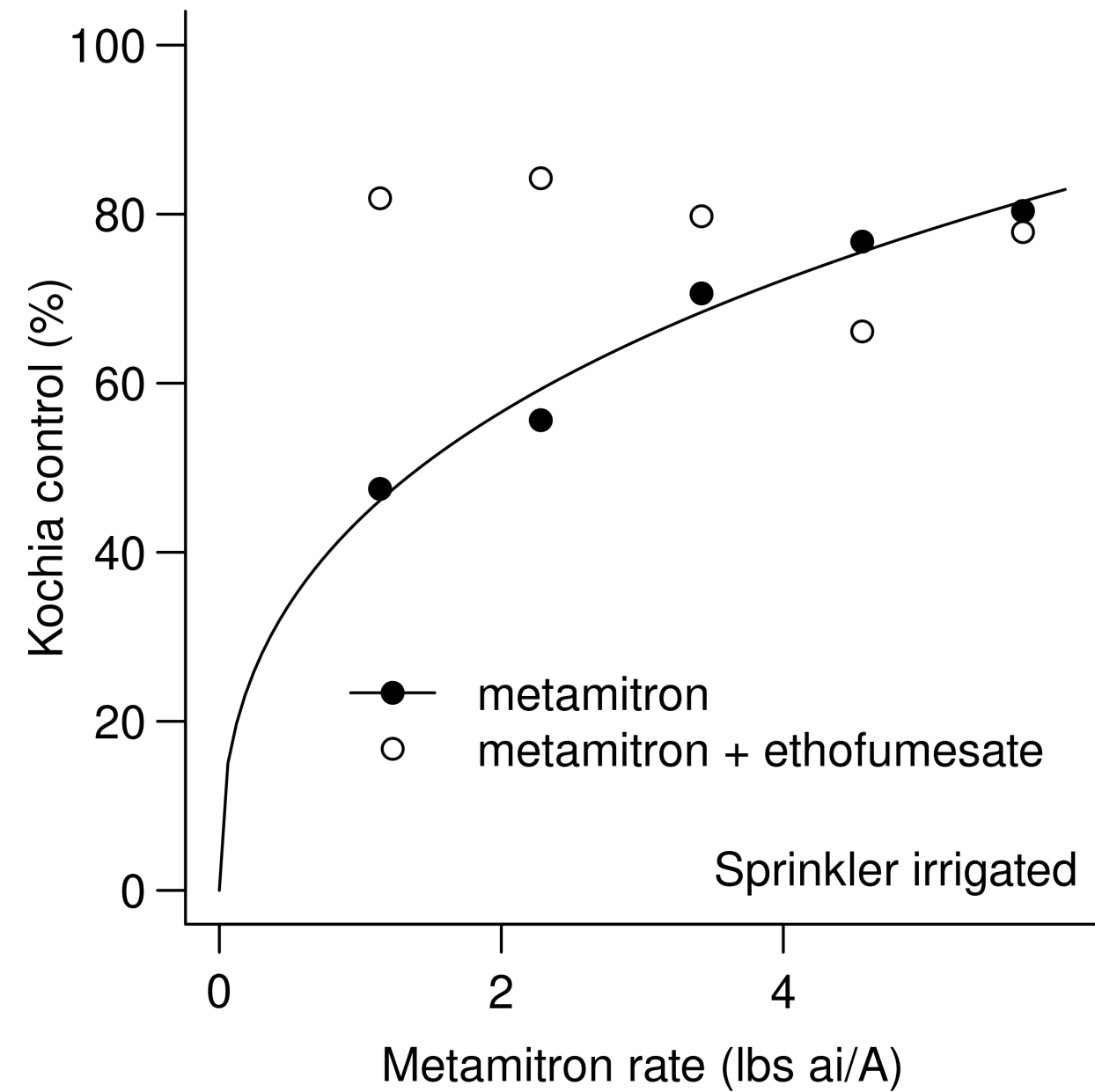


Untreated control



Ultra Blazer 16 fl oz/A

2021



Kochia management in sugarbeet

🐎 50 years of kochia herbicide research summarized:

The best way to make a herbicide more effective is to mix it with a herbicide that is more effective.

Kochia management in sugarbeet

🐎 50 years of kochia herbicide research summarized:

The best way to make a herbicide more effective is to mix it with a herbicide that is more effective.

There are no highly effective POST sugarbeet herbicides for kochia.

Kochia management in sugarbeet

🐎 50 years of kochia control research summarized:

There are no simple answers

Thank you Western Sugar Grower-Joint Research
Committee for funding 16 years of my research



(even though I still haven't figured out how to kill
kochia consistently...)



UNIVERSITY
OF WYOMING

Weed
Science