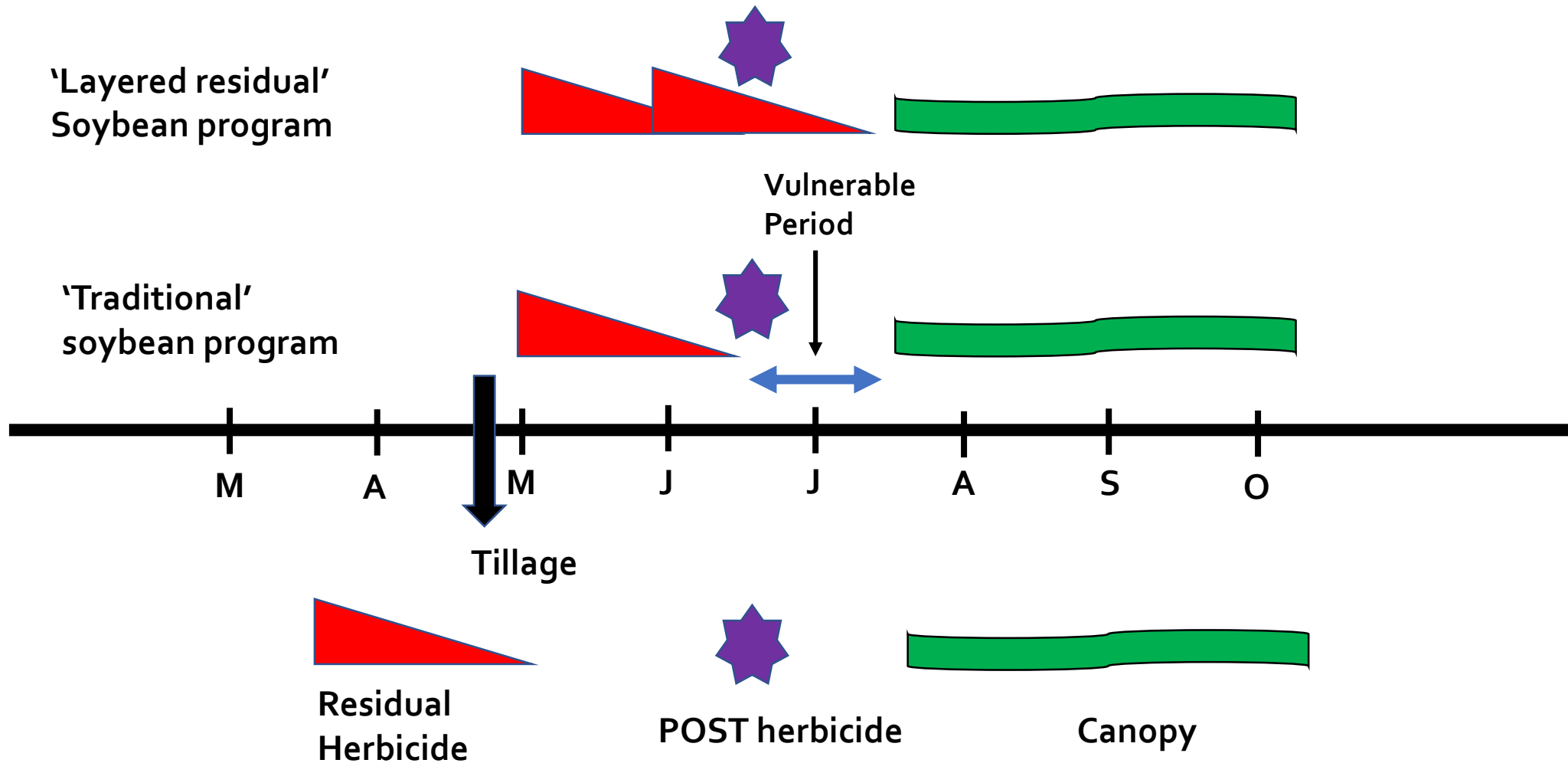


# Layered Residual Herbicides

Objective: Prolong PRE activity until canopy fills



# Waterhemp is the most important weed control challenge in sugarbeet

- 610,000 acres sugarbeet in Minnesota and eastern North Dakota in 2018.
- Waterhemp is the most important weed control challenge on 237,600 acres, 35% of acreage.
- 95% and 98% of surveyed Producers attending 2018 Willmar and Wahpeton Grower seminars, respectively, used chloroacetamide herbicides for waterhemp control.
- Adoption of layered application technique (PRE fb POST, EPOST fb POST or PRE fb EPOST fb POST) increased 29% between the 2015 and 2017 growing seasons.







# Waterhemp Control Recommendations

Planting Date	Recommendation
<b>Plant Sugarbeet in April</b>	Split lay-by application (early postemergence / postemergence) of chloroacetamide herbicides applied at 2-lf sugarbeet fb 6 to 8-lf sugarbeet
	Dual Magnum and/or ethofumesate PRE followed by a split lay-by application at 2 to 4-lf stage fb 6 to 8-lf stage
	Single lay-by application when sugarbeet is at the 2-lf stage or greater
<b>Plant Sugarbeet in May</b>	Dual Magnum and/or ethofumesate PRE followed by a split lay-by
<b>April or May planting</b>	Continue to scout fields for late germinating waterhemp in late June and July
<b>April or May planting</b>	Be prepared to rescue with Betamix + ethofumesate, UpBeet+ ethofumesate or Betamix + UpBeet (be aware of resistant biotypes), inter-row cultivation

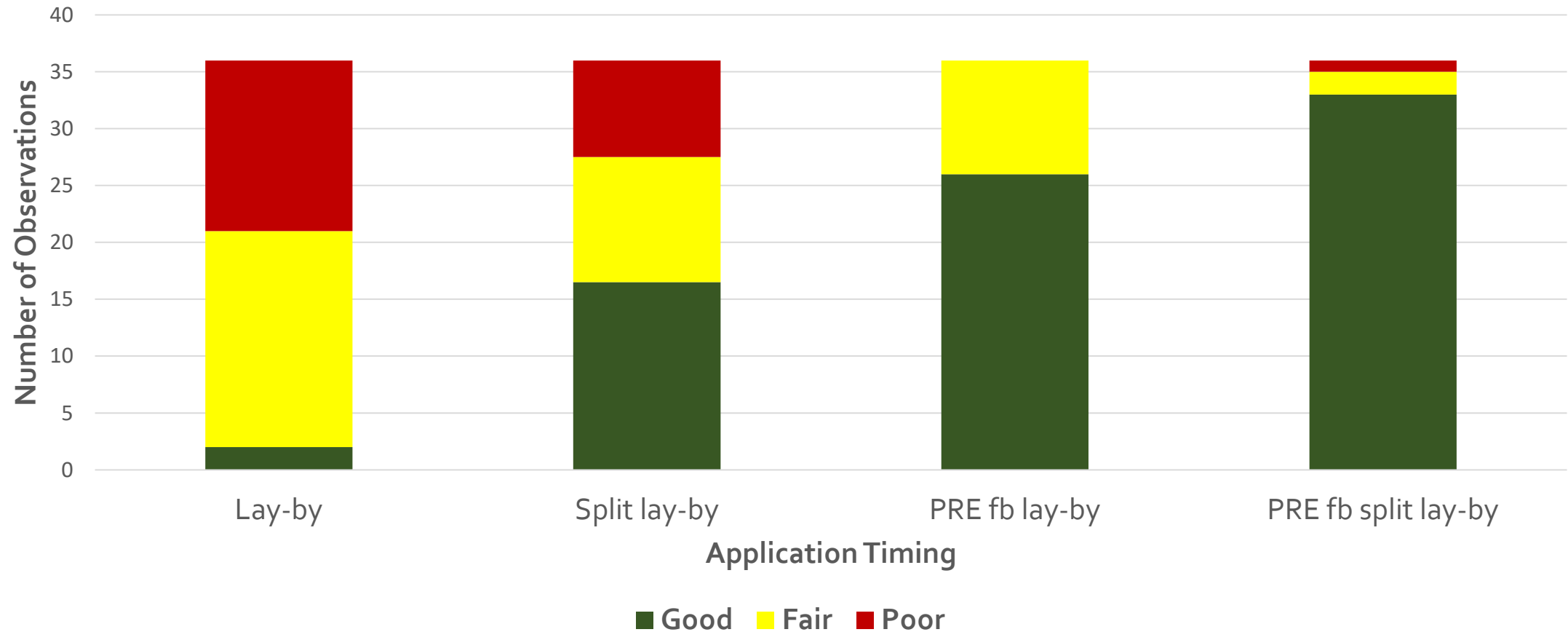


2-leaves, May 10



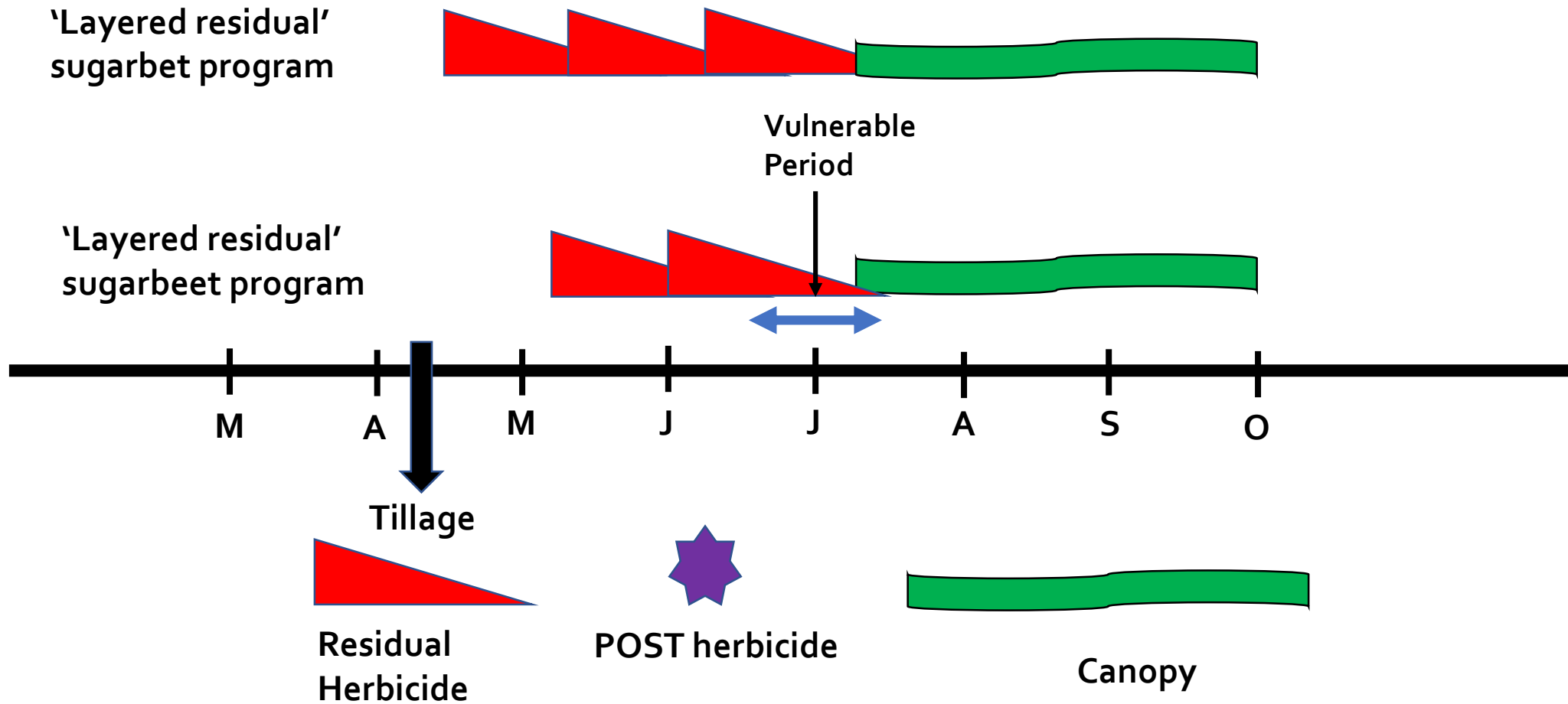
8-leaves, June 15

# Number of good, fair, and poor estimates of waterhemp control across herbicides and application timing, summed across evaluations, locations, and years



# Layered Residual Herbicides for Sugarbeet

Objective: Prolong PRE activity until canopy fills



# Are our rates correct?

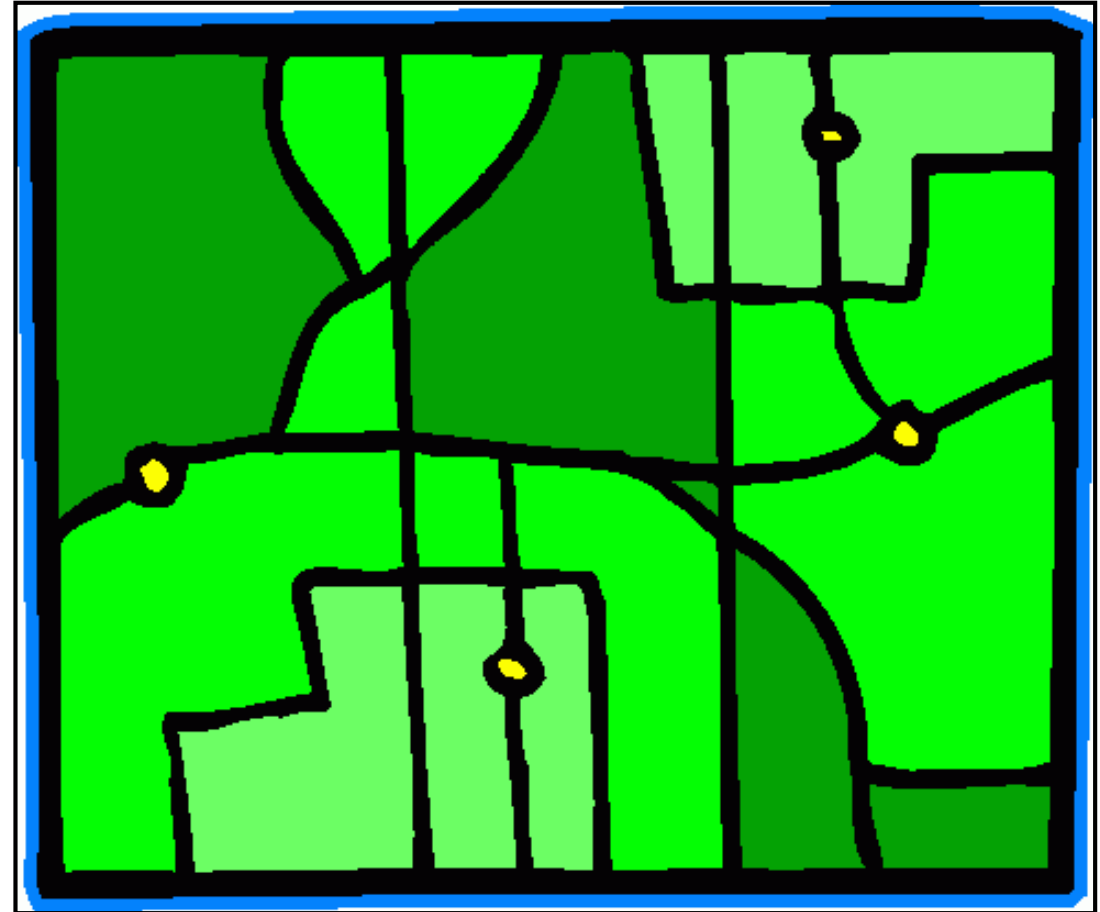
## Should we use SOA 8? (ethofumesate PRE)

Herbicide	Our rate	Maximum rate
ethofumesate	2 pt PRE fb 12 fl oz POST	Up to 7.5 pt PRE fb 12 fl oz POST, soil type will dictate PRE rate
S-metolachlor	0.5-0.75 pt PRE fb 1 pt fb 1 pt POST	Don't exceed 2.67 pt; 1.67 in a single application on fine textured soils
Warrant	2.5 pt fb 2.5 pt POST	4 pt fb 4 pt (fine textured soils with greater than 1.5% OM)
Outlook	12 fl oz fb 12 fl oz POST	24 fl oz



# One size does not fit all

- Farms are not factories
- Fields are boutique shops



# Strategy



**Which Weed is MOST difficult for you to manage across your field?**



**Which Weed is 2<sup>nd</sup> most difficult for you to manage across your field?**

**A. Giant ragweed**

**B. Common ragweed**

**C. Redroot Pigweed**

**D. Waterhemp**

**E. Lambsquarters**

**F. Kochia**

**G. Common Cocklebur**

**H. Grasses**

**I. Other**

**A. Giant ragweed**

**B. Common ragweed**

**C. Redroot Pigweed**

**D. Waterhemp**

**E. Lambsquarters**

**F. Kochia**

**G. Common Cocklebur**

**H. Grasses**

**I. Other**

**Properly  
Identify  
Weeds**



# Crop sequence across region and Cooperative

Sugarbeet production in Minnesota and North Dakota

## **South – Southern Minnesota Beet Sugar Cooperative**

- Corn, soybean, corn, sugarbeet – most common
- Soybean, corn, corn, sugarbeet – second most common

## **Mid – Minn-Dak Farmers Cooperative**

- Corn, soybean, corn, sugarbeet

## **North – American Crystal Sugar Company**

- Corn, soybean, wheat, sugarbeet

# Available Sites of Action By Crop

Site of Action (SOA number)			
Corn PRE	Corn POST	Soybean PRE	Soybean POST
2	2	2	2
4	4	3	[9]
5	5	5	[10]
15 (ePOST)	[9]	14	14
27	[10]	15 (ePOST)	4
	14	4	27
	27	27	

- Reliance on a specific SOA across crops/years increases the likelihood of resistance
- Generational differences in weeds from season to season

[ ] = GMO

Adapted from a slide by Dr. Jeff Gunsolus, Univ of Minnesota

# Corn rotate to Sugarbeet

Premergence	SOA	Postemergence <sup>a</sup>	SOA
Chloroacetamide (Dual Magnum / Harness / Outlook)	15	Dicamba & diflufenzopyr & safener	4 & 19
Chloroacetamide & Sharpen	15+14	Dicamba & safener	4
		Laudis + atrazine	27+5
		dicamba & Laudis & safener	4 & 27
		glyphosate	9

<sup>a</sup>& = premix; + = tank-mix



# Corn rotate to Sugarbeet

Products with crop rotation restrictions preventing sugarbeet planting the following year

Premergence	months	Postemergence <sup>a</sup>	months
<b>Anthem Maxx</b> (puroxasulfone & fluthiacet) (15 & 14)	15	<b>Armezon Pro</b> (atrazine & topramezone & dimethenamid-P) (5 & 27 & 15)	18
<b>Corvus</b> (isoxaflutole & safener) (27)	17	<b>Halex GT</b> (glyphosate & S-metolachlor & mesiotrione) (9 & 15 & 27)	18
<b>Acuron Flexi</b> (S-metolachlor & mesiotrione & bicyclopyrone & safener) (15 & 27 & 27)	18	<b>Realm Q</b> (rimsulfurone & mesotrione & safener) (2 & 27)	18
<b>Balance Flexx</b> (isoxaflutole & safener) (27)	18		
<b>Resicore</b> (acetoachlor & mesotrione & clopyralid) (15 & 27 & 4)	18		
<b>Surestart II</b> (acetoachlor & flumetsulam & clopyralid) (15 & 2 & 4)	26		

<sup>a</sup>& = premix; + = tank-mix

# What herbicide trait should we plant in our 2019 soybeans?

- A. Conventional
  - B. Glyphosate Tolerant
  - C. Roundup Ready 2
  - D. Roundup Ready Xtend
  - E. Liberty Link
- 1. Yield potential is most important decision factor
  - 2. Other trait packages, e.g. SCN
  - 3. Price per unit
  - 4. Effective herbicide against primary or secondary weed
  - 5. Fits with the weed management strategy

# Thank you for your Support

Tom Peters

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