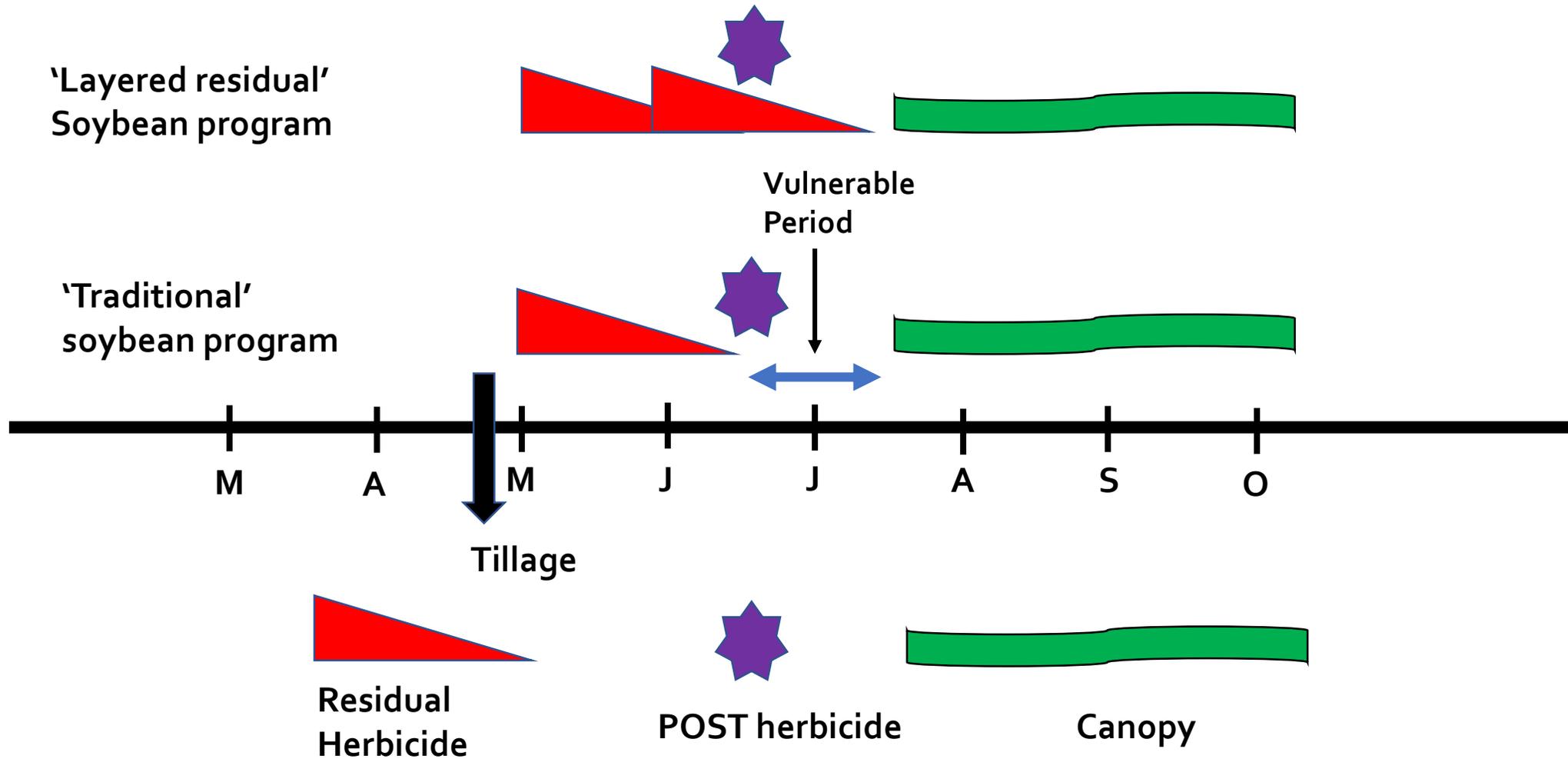


# Layered Residual Herbicides

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

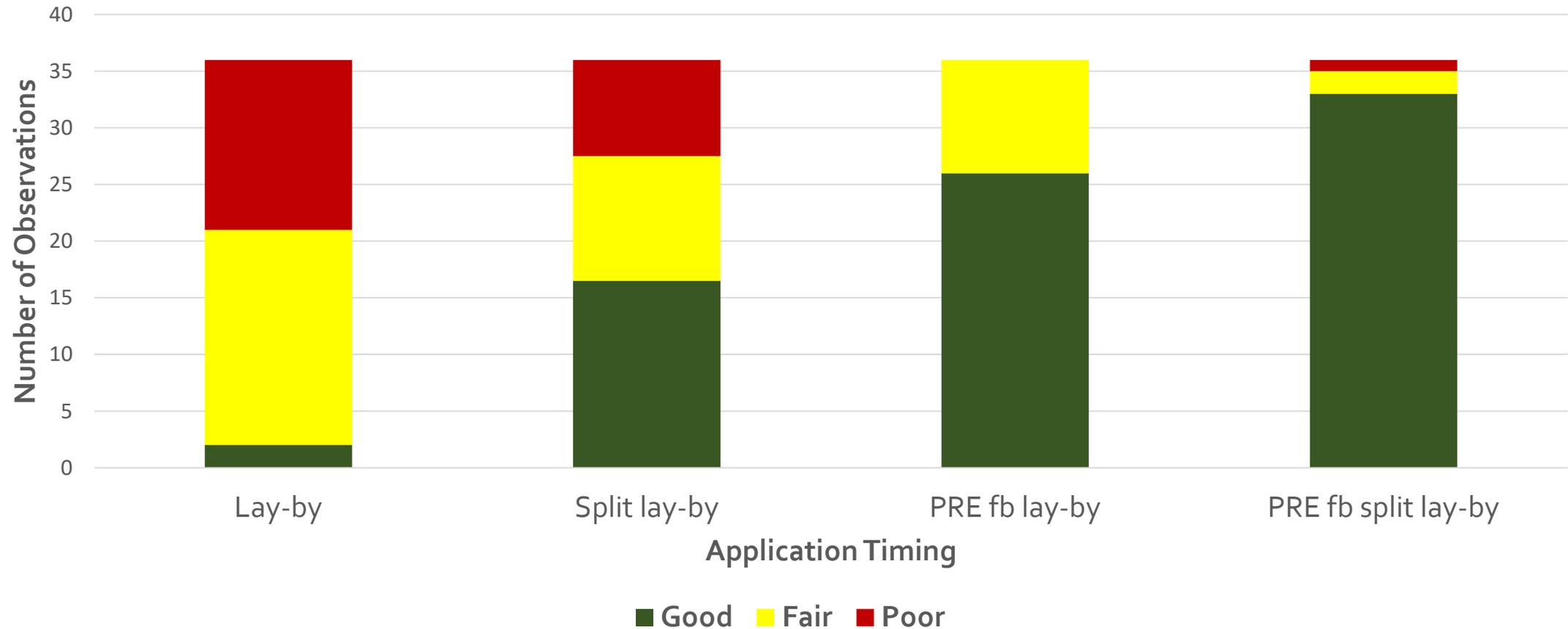


2-leaves, May 10



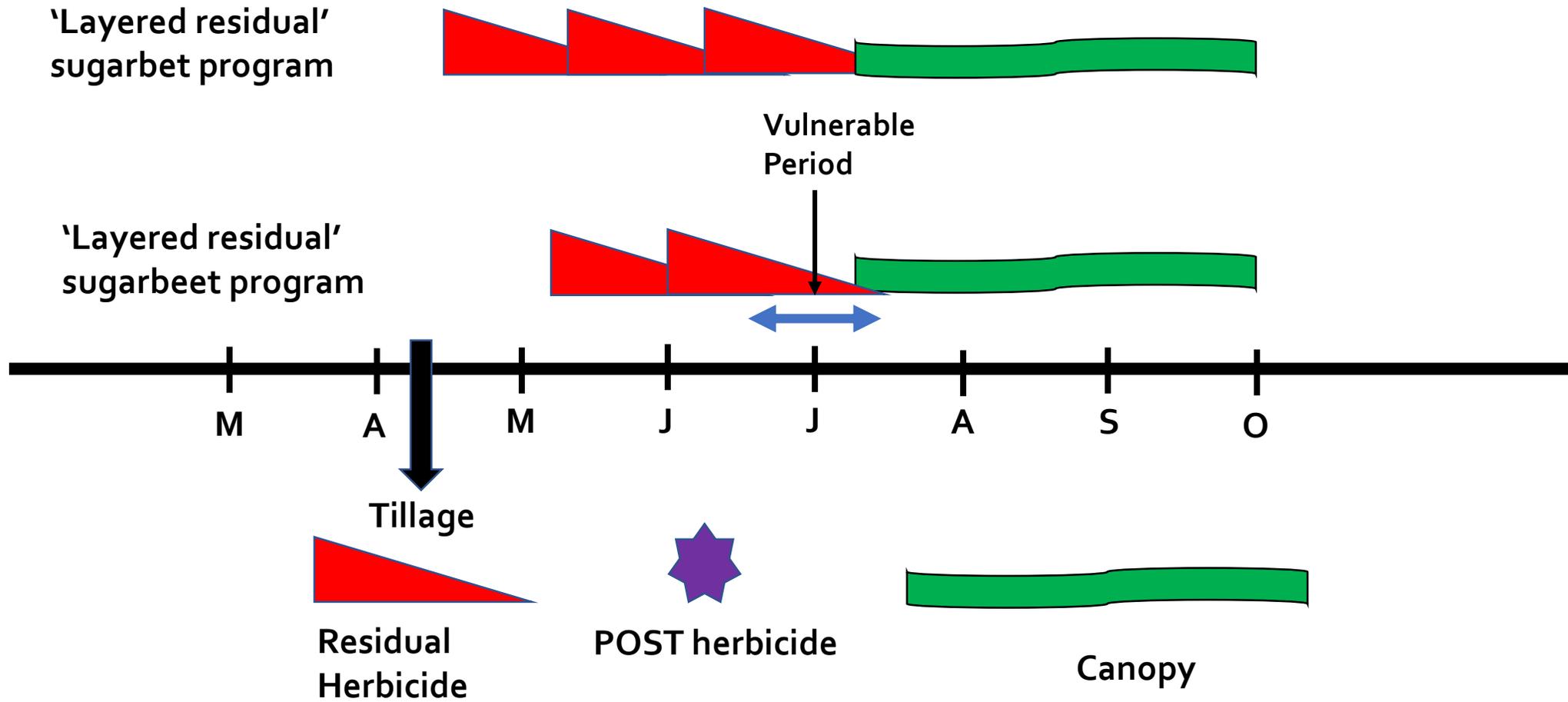
8-leaves, June 15

# 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



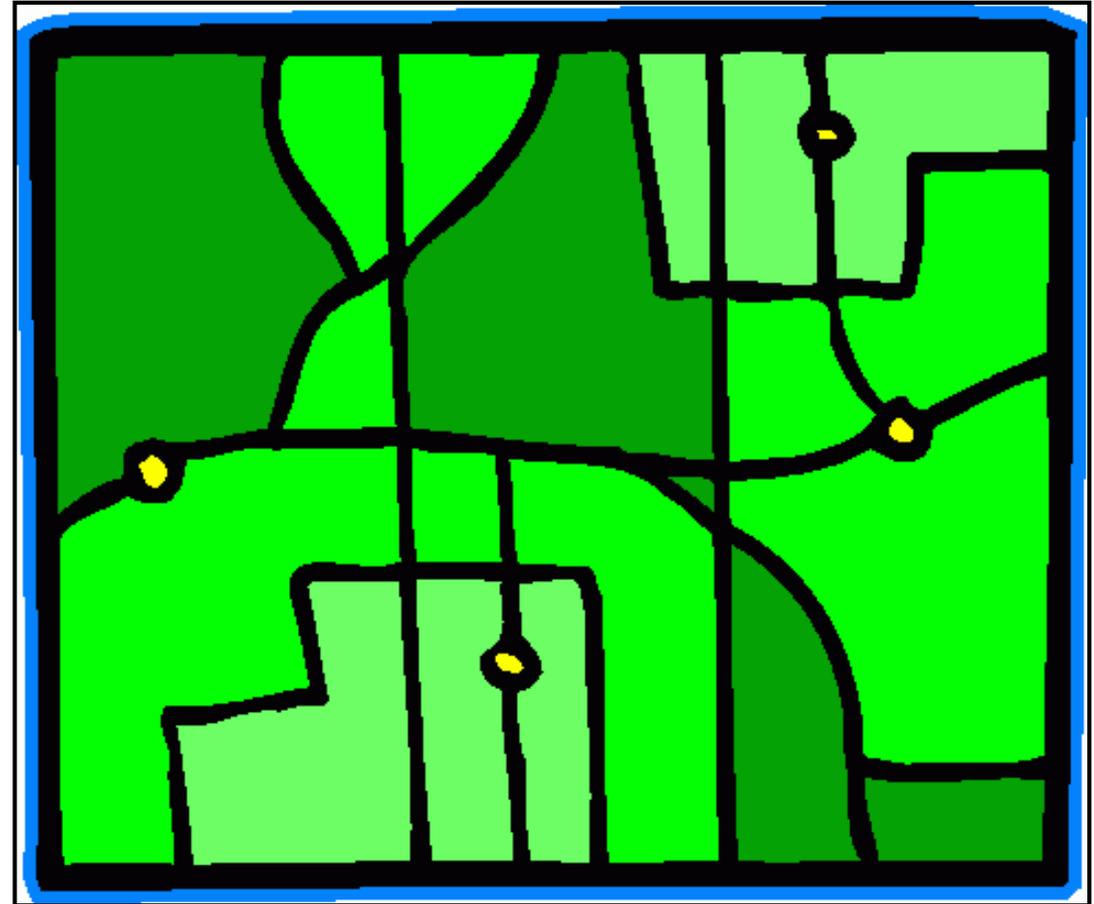
# Are our rates correct?

## 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

# Corn rotate to Sugarbeet

Preemergence	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

Preemergence	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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