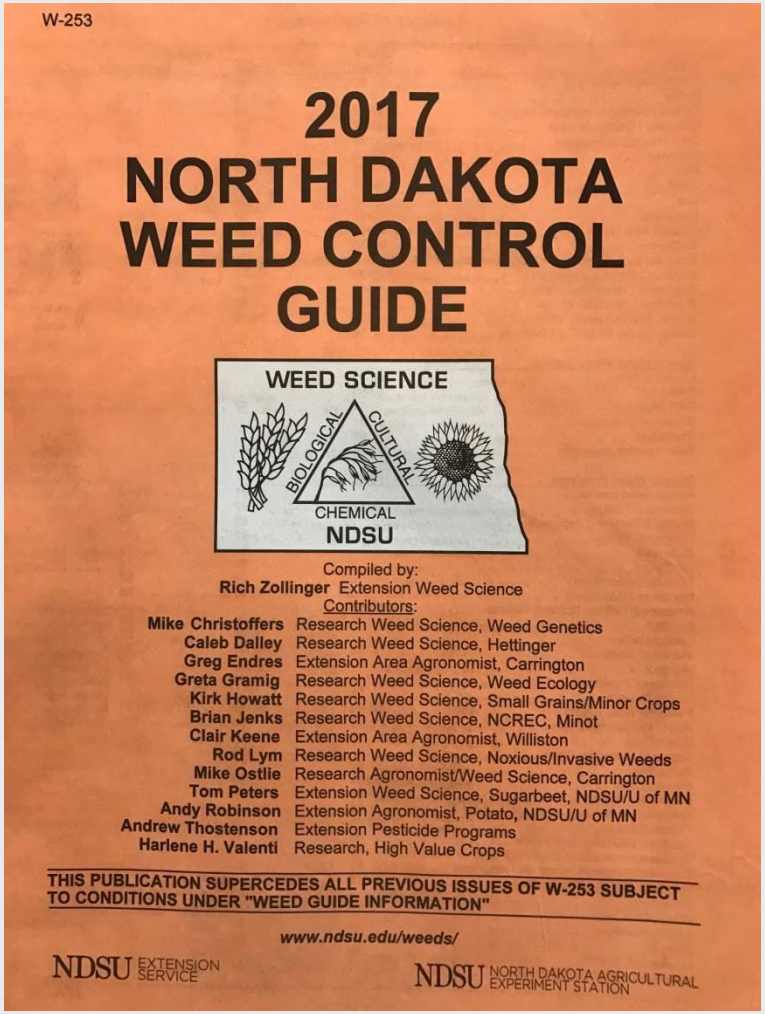
2017 Herbicide/Weed Issues and Updates

Rich Zollinger
NDSU Extension Weed Specialist

New Herbicides for 2017 – No new MOA active ingredients.

Herbicide update and changes for 2017 – See page 135



W-253

2017
NORTH DAKOTA
WEED CONTROL
GUIDE

WEED SCIENCE
BIOLOGICAL
CULTURAL
CHEMICAL
NDSU

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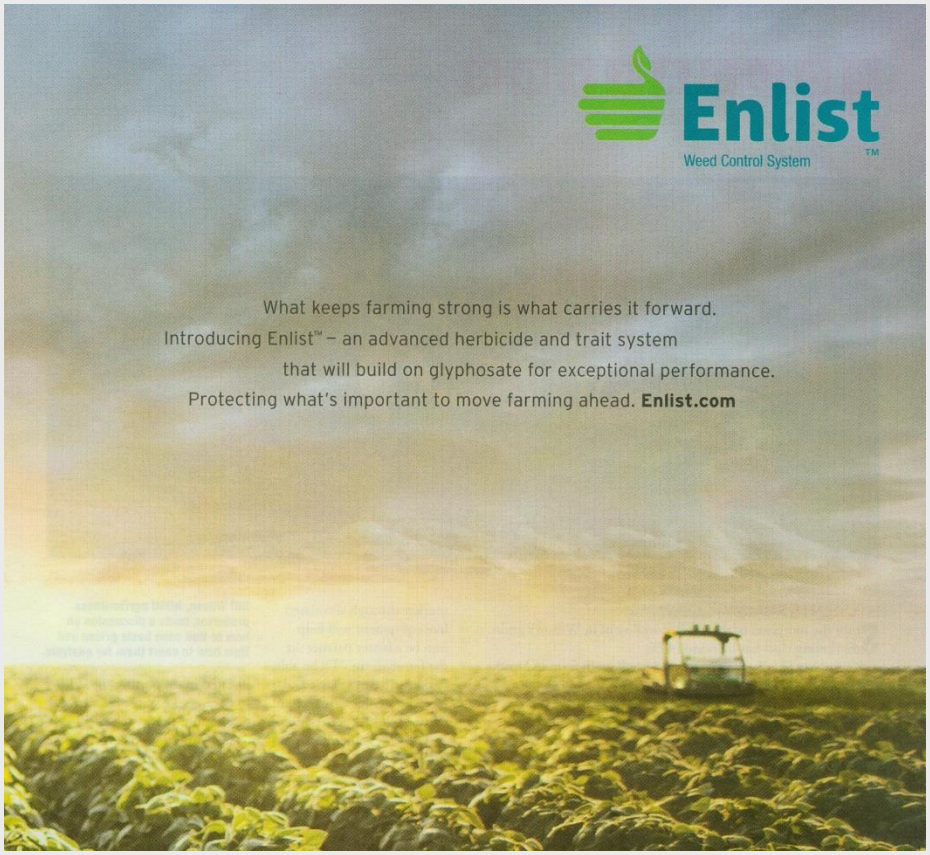
THIS PUBLICATION SUPERCEDES ALL PREVIOUS ISSUES OF W-253 SUBJECT TO CONDITIONS UNDER "WEED GUIDE INFORMATION"

www.ndsu.edu/weeds/

NDSU EXTENSION SERVICE

NDSU NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION

Question:
Will new herbicide technology solve our weed problems?



Herbicide vapor pressure

	mm Hg (mercury)		
Liberty	0.000000000009	($x10^{-12}$)	Non-volatile
Paraquat	0.000000001	($x10^{-9}$)	
Glyphosate	0.00000002	($x10^{-8}$)	
Treflan	0.0002	($x10^{-4}$)	
2,4-D salt	"Not volatile"		
ester	0.0004	($x10^{-4}$)	Volatile
acid	0.4 (insoluble in water)		
Dicamba salt	0.000002	($x10^{-6}$)	
acid	0.00002	($x10^{-5}$) at 75F	
acid	0.004	($x10^{-3}$) at 100F	
Eptam	0.03	($x10^{-2}$)	
Water	24		

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Enlist and RU Xtend = New Technology Requires a different mind-set!

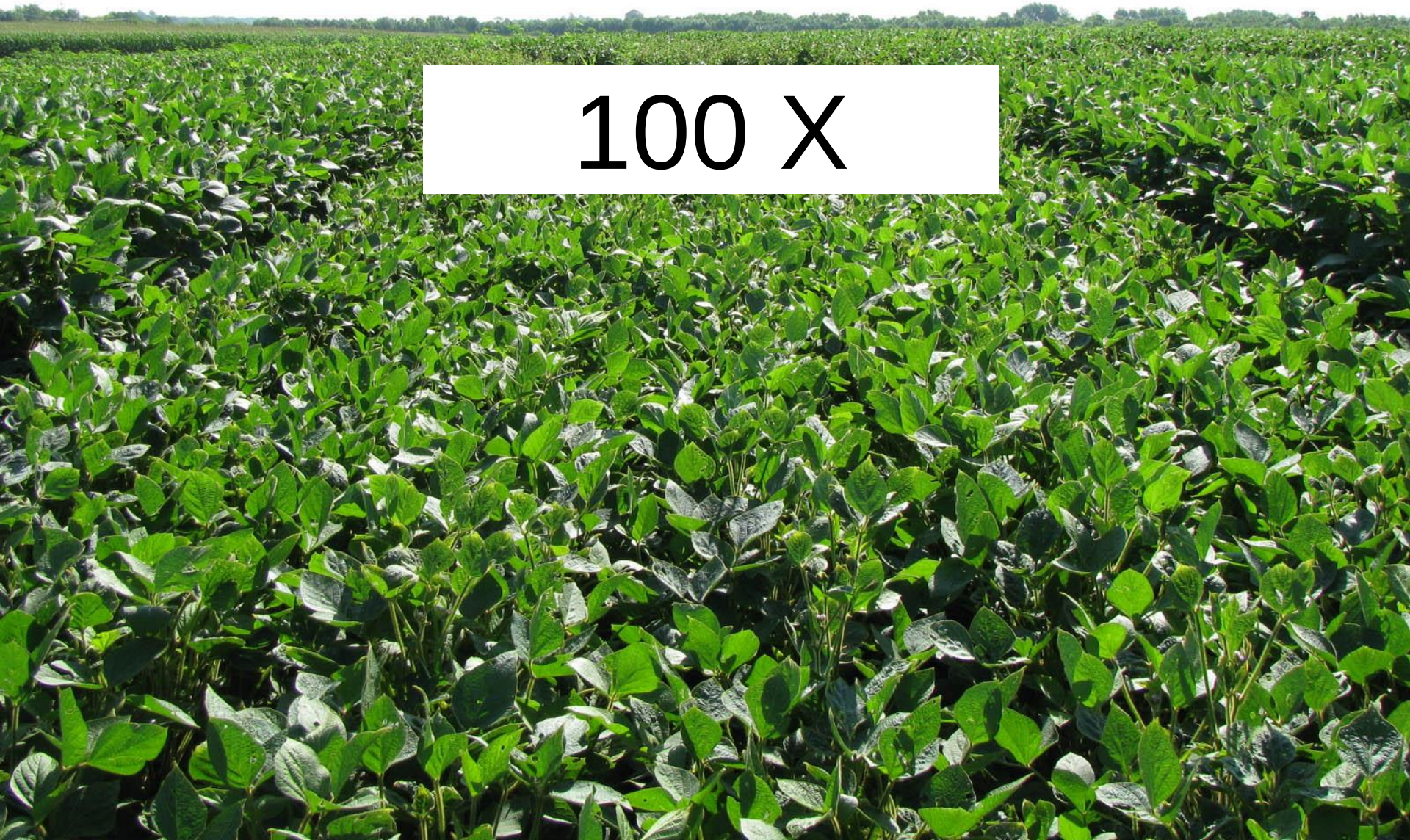
- Particle drift (including inversions)
- Volatilization

- Sprayer cleanout - contamination
- Misapplication

Soybean is ___ x more tolerant to 2,4-D than dicamba?

Dr. Andy Robinson, NDSU Potato Agronomist

Soybean is ___ x more tolerant to 2,4-D than dicamba?



100 X

2017 Dicamba Resistance Soybean

Registered Herbicides:

1. Xtendimax – 2.9SL dicamba-dga + VaporGrip
2. Engenia – 5SL dicamba-BAPMA

Registered Pending Herbicides:

1. **RU Xtend** = glyphosate-mea + dicamba-dga + Vapor Grip

   64 fl oz/A = dic @ 1 pt/A + glyt at 1 lb ae/gal

2. **FeXapan** (Dupont) = XtendiMax + Vapor Grip

12 Points about DR/DT Soybean

1. Label language
   - Most labels – This herbicide ‘may be …..’
   - Xtendimax = 40 statements - ‘Do not…..’
   - Engenia = 25 statements - ‘Do not….’

   ‘Monsanto makes no warranty….’

   ‘Buyer/user are solely responsible for damage….’

- READ the ND supplemental label and ND Weed Guide page 28 and paragraph E4 on page 81.

Follow label with extreme exactness!

12 Points about DR/DT Soybean

1. Label language

   ‘Do not allow herbicide to mist, or drift onto desirable foliage….’

   ‘Do not apply this product when wind is blowing toward sensitive crops.’

   ‘Do not allow contact of herbicide with foliage of desirable plants.’

   ‘Applicators are required to be aware of proximity to susceptible crops’

   ‘The applicator is solely responsible for considering these factors….’

Don’t read the label – DON’T use the technology!!

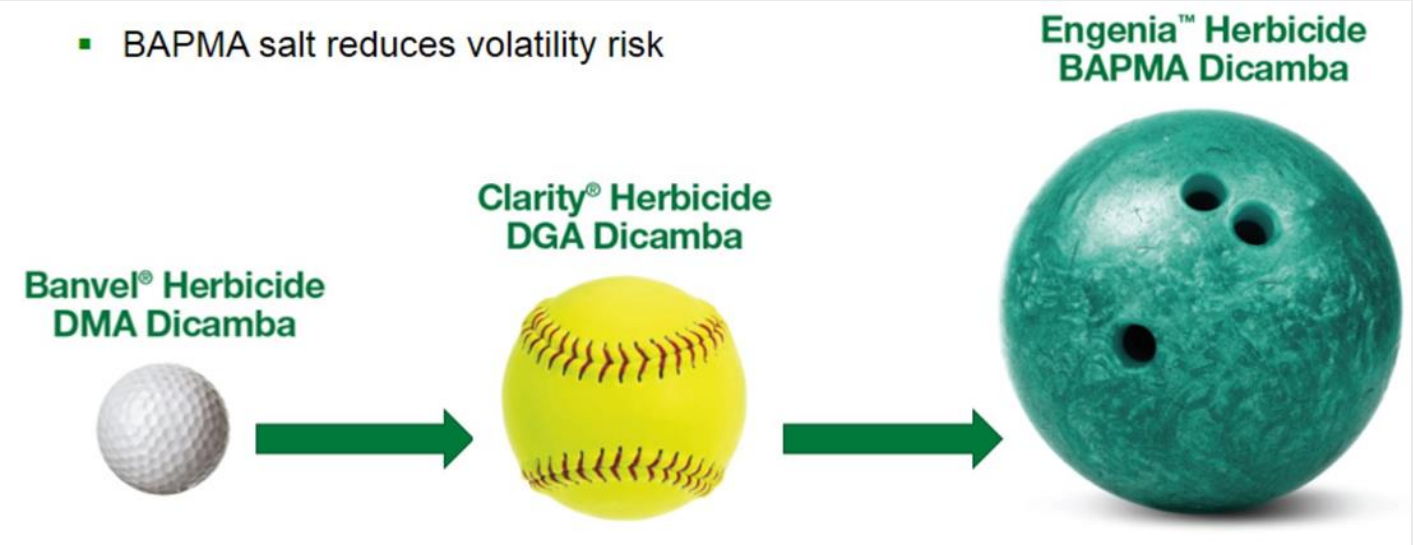
12 Points about DR/DT Soybean

2. www.xtendimaxapplicationrequirements.com
   engeniatankmix.com
   - EPA views web sites as extension of label
   - Contains:
     - application information
     - approved nozzles
     - tank-mix options
     - adjuvant options
   - Must check web site <7 days prior to application

   - Nothing on web sites at present time

12 Points about DR/DT Soybean

3. Low volatile formulations

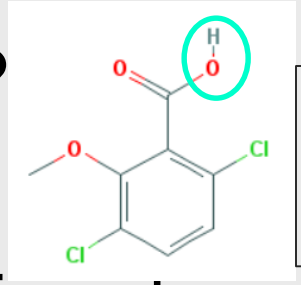


Engenia = 97% less volatile than Banvel

= 70% less volatile than Clarity

12 Points about DR/DT Soybean

4. XtendiMax with “Vapor Grip”?



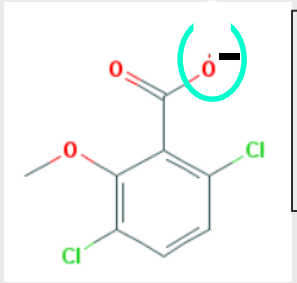
Highly volatile

pH < 5.5 = dicamba-dga $\xrightarrow{H^+}$ dicamba acid + dga

pH > 5.5 = dicamba-dga $\longrightarrow$ dicamba + dga

“Do not add AMS”

“Do not add acidifiers”



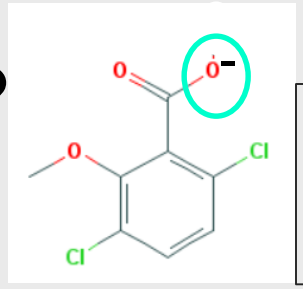
Low volatile

Vapor Grip = water pH > 5.5 = dicamba-anion

XtendiMax = 90% lower volatility than Clarity

12 Points about DR/DT Soybean

4. XtendiMax with “Vapor Grip”?



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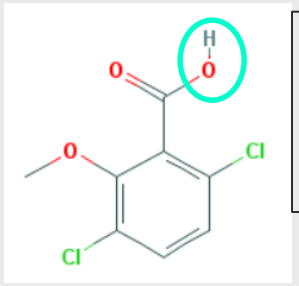

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12 Points about DR/DT Soybean

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90% lower volatility than Clarity

Engenia

97% less volatile than Banvel

70% less volatile than Clarity

12 Points about DR/DT Soybean

4. XtendiMax with “Vapor Grip”?

90% lower volatility than Clarity

Engenia

97% less volatile than Banvel

70% less volatile than Clarity

Low volatility NOT no-volatility formulations

12 Points about DR/DT Soybean

5. XtendiMax and Engenia rates and timing
   - XtendiMax = Not less than 22 fl oz/A (0.5 lb ai)
   - Engenia = Not less than 12.8 fl oz (0.5 lb ai)

Preplant =	1 app	0.5 lb ai
Preemergence =	1 app	0.5 lb ai
2 weeks residue is NOT a residual PRE!		
Post =	2 apps	0.5 + 0.5 lb ai
Total	4 apps	2 lbs ai

Label language:

“Avoid making more than 2 applications/season”

Weed control ratings

Label = ‘Control weeds <4 inches tall’

	Enlist (2,4-D)	RU Xtend (dicamba)
Horseweed	E	E
Kochia	N	F-E
Ragweed	E	E
Waterhemp	P-G	P-E
P. Amaranth	P-F	P-E

Why difference in control ratings?

Palmer amaranth grows ____ per day?

12 Points about DR/DT Soybean

6. Timing on DR soybean – PRE to R1

- Timing on wheat or corn = early spring
  earlier than broadleaf crop emergence
- Timing on DT soybean =
  - PRE through R1 soybean
  - June 15 to July 15
  - Many broadleaf crops emerged

Damage to susceptible broadleaf crops INCREASE:

- as plant age INCREASES
- in water stress conditions

12 Points about DR/DT Soybean

6. Timing on DR soybean – PRE to R1

ND Weed Control Guide page 81:

Relative susceptibility of crops from dicamba drift:

Low susceptibility: small grain, canola, corn, flax, millet, triticale.

Moderately susceptibility: alfalfa, buckwheat, potato, safflower, and tomato.

Very high susceptibility: chickpea, dry bean, field pea, grape, lentil, sunflower, soybean, and sugarbeet.

12 Points about DR/DT Soybean

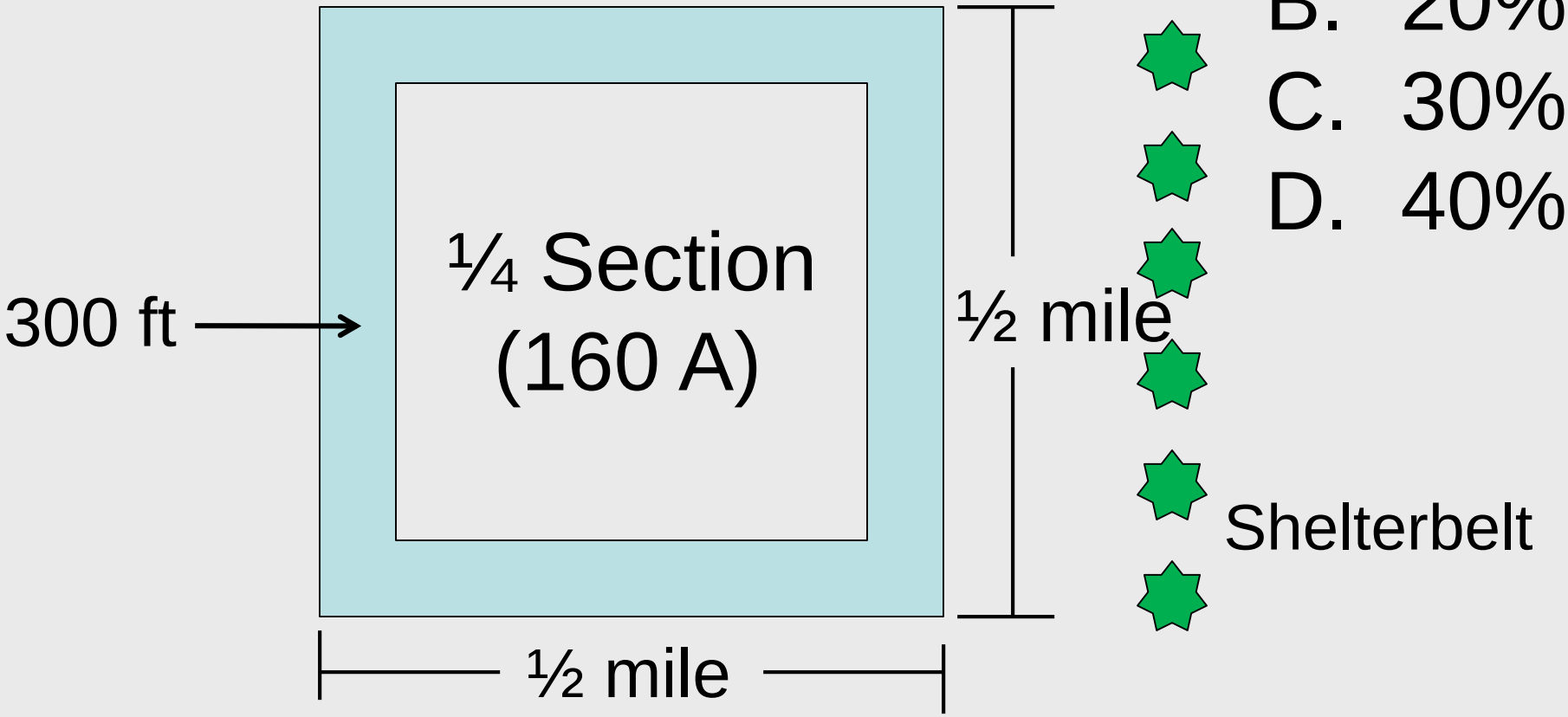
7. Buffer
   - XtendiMax = 110 ft for 22 fl oz/A (0.5 lb ai)
     220 ft for 44 fl oz/A (1 lb ai)
   - Engenia = 110 ft buffer for 12.8 fl oz (0.5 lb ai)
   - Definition of sensitive areas??

Buffer zones

Question – POST-DRT

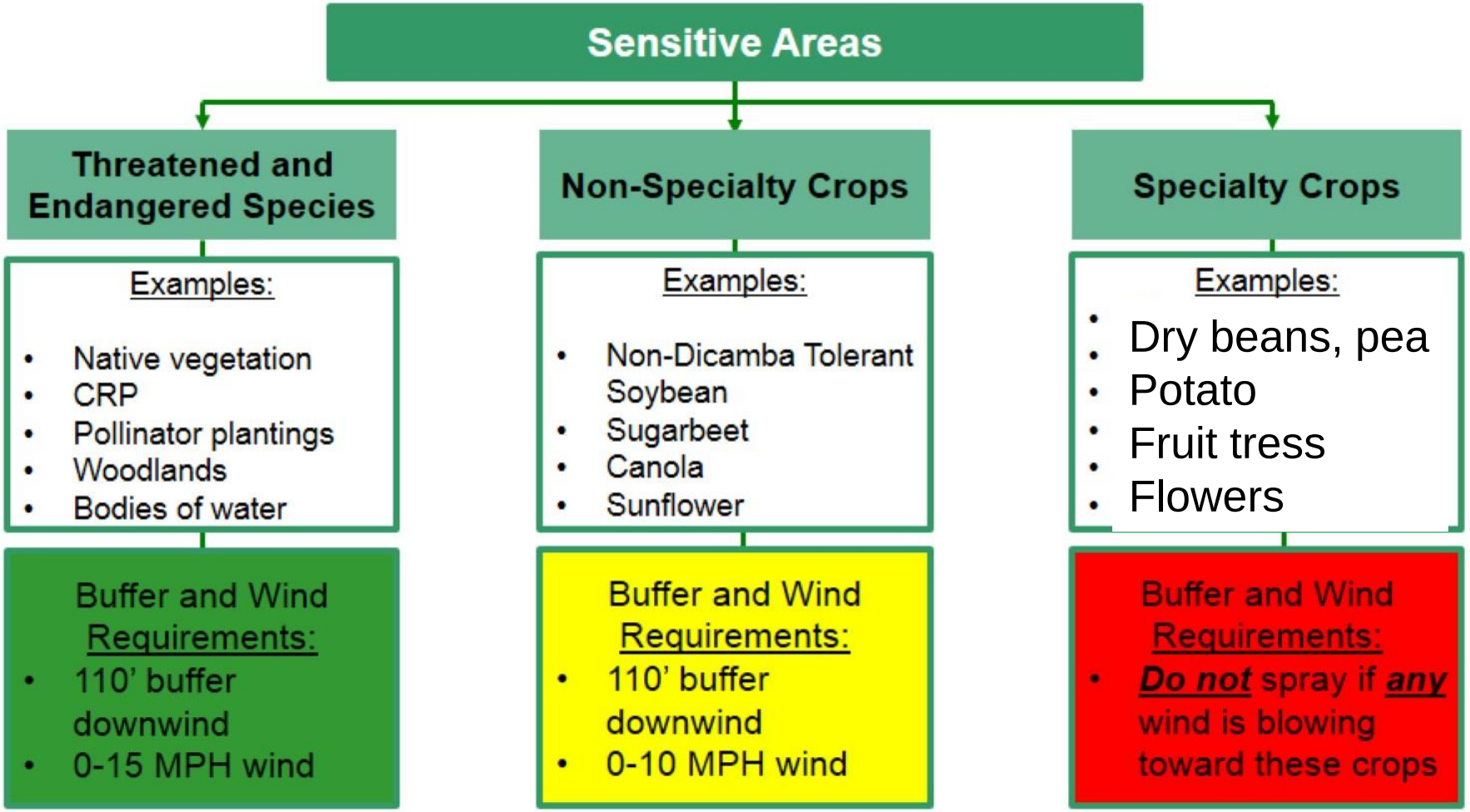
A 300 ft buffer zone is what % a ¼ section of land?

A. 10%
B. 20%
C. 30%
D. 40%



Engenia™ Herbicide
Definition of Sensitive Areas

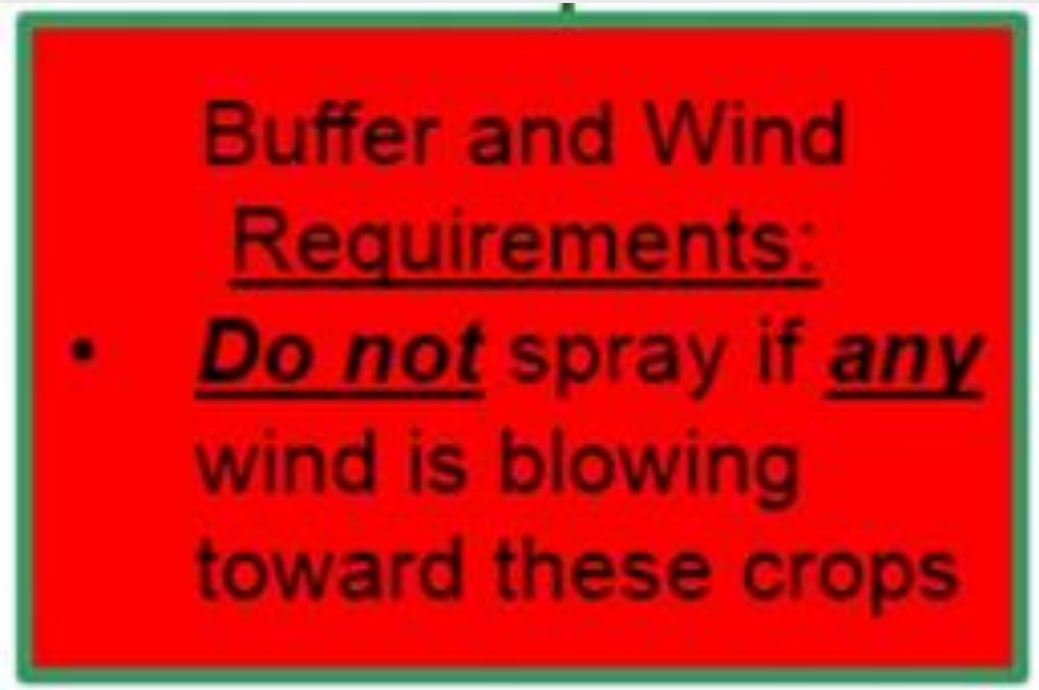
BASF
We create chemistry



12 Points about DR/DT Soybean

7. Buffer

‘Do not apply product when wind is blowing toward sensitive crops.’



How far away do these crops need to be?

12 Points about DR/DT Soybean

8. Meticulous sprayer clean-out
   - Mandatory triple rinse - 11 step process
   - Why must be done PERFECTLY?

- Dicamba concentration to cause soybean injury:

  0.01% = 0.05 fl oz or 1.5 ml Clarity in 500 gal tank

1 soda cap dicamba/500 gal

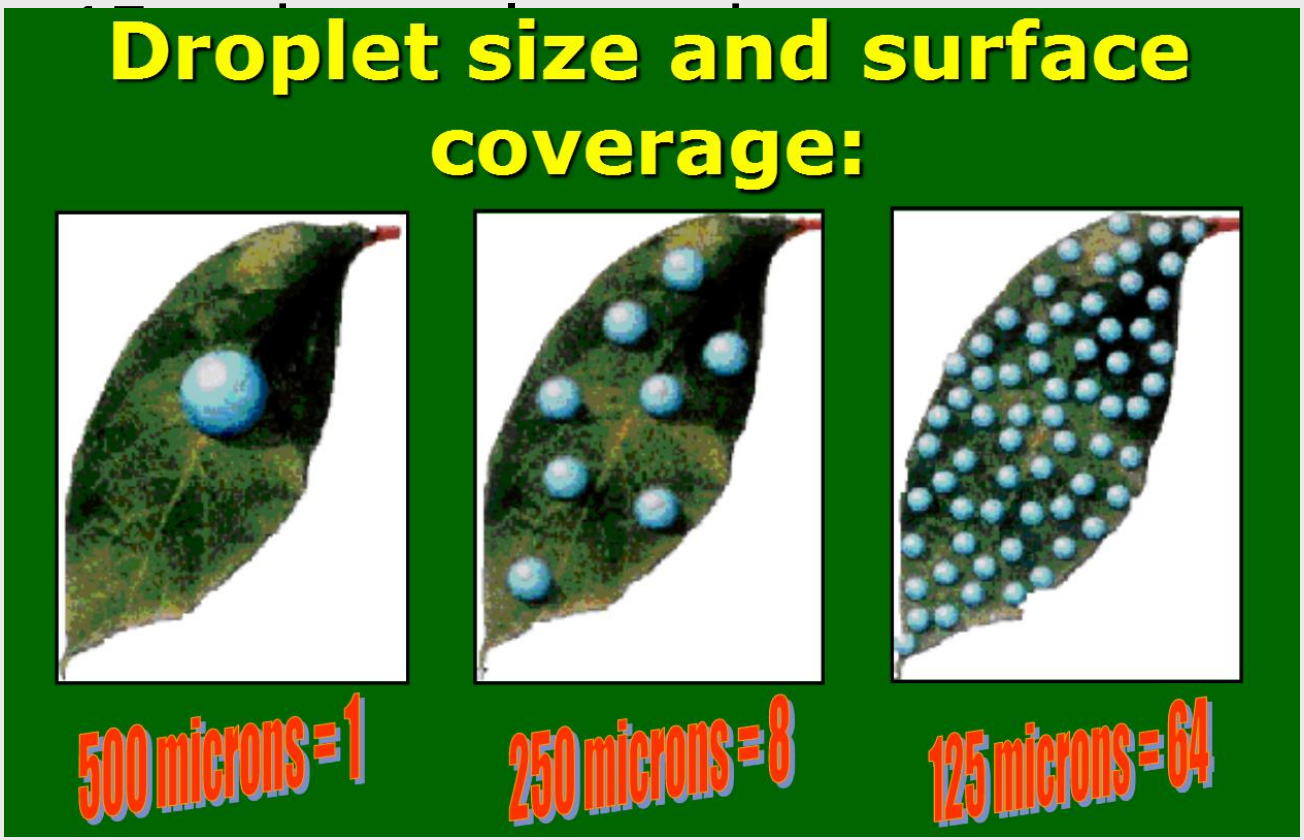
12 Points about DR/DT Soybean

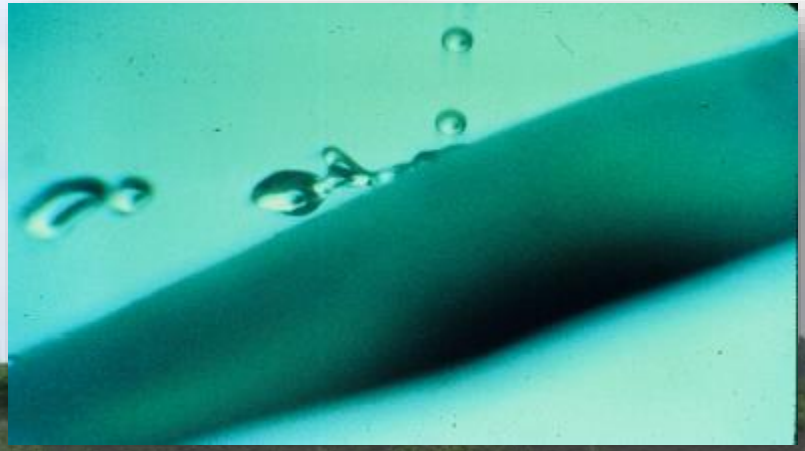
9. Best Management Practices (BMPs)
   - Nozzles = extreme-ultra coarse droplets (>450 microns)
   - <15 mph travel speed
   - 3-10 wind speed
   - <24 inch boom height
   - Observe buffer zones
   - No add drift reducing agent
   - Sprayer clean out using triple rinse….
   - Do not add AMS

12 Points about DR/DT Soybean

9. Best Management Practices (BMPs)

- Nozzles = extreme-ultra coarse droplets (>450 microns)





Phenoxy type herbicide (28 days after application)

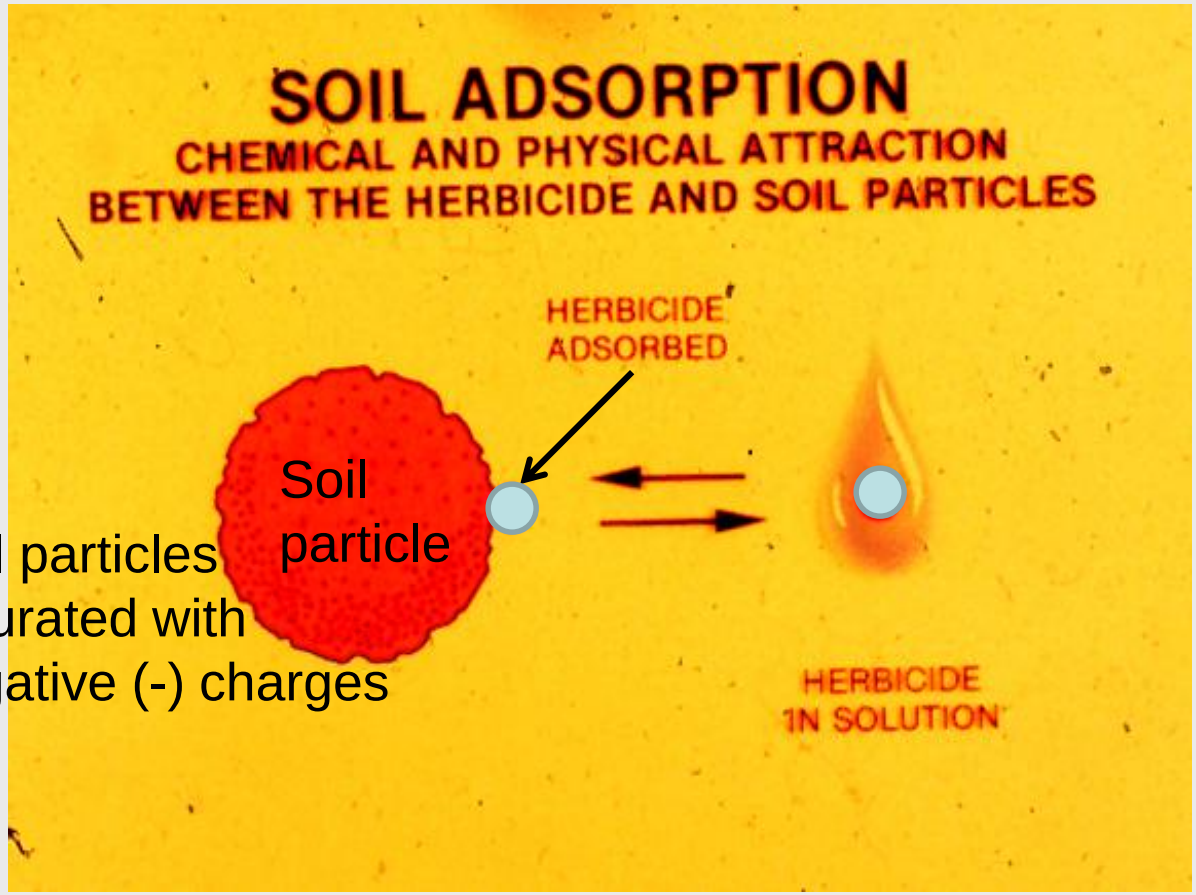
Very coarse vs. Fine

Dr. Kirk Howatt, NDSU

12 Points about DR/DT Soybean

10. Universal principle of chemistry =

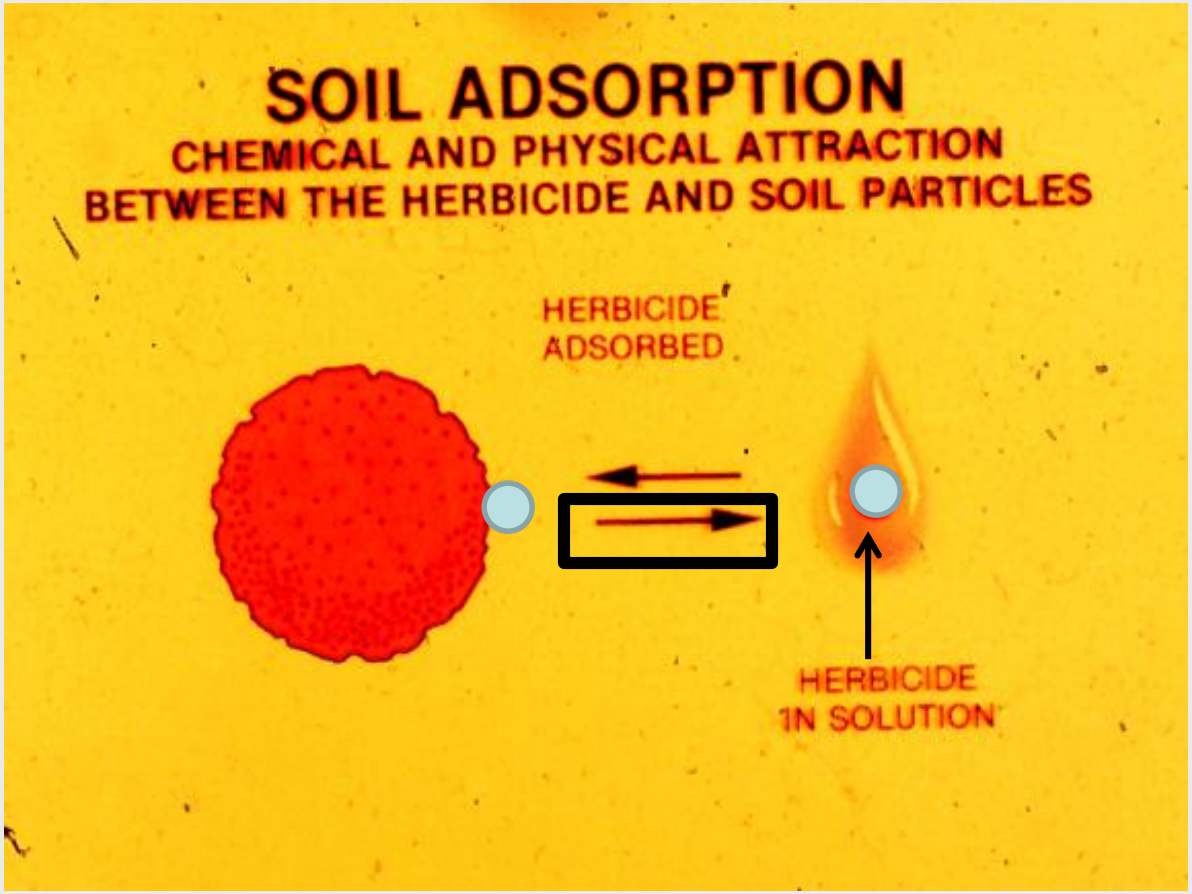
ADSORPTION



Soil particles saturated with negative (-) charges

12 Points about DR/DT Soybean

10. Reversible binding to soil



Dicamba may desorb from soil particles and volatilize after delayed rain event

12 Points about DR/DT Soybean

11. Dicamba resistant weeds
    - Label allows 4 applications – 2 lbs ai/A
    - Label recommends tank-mixtures – none on web
    - Will growers break this technology like:
        - SU – Group 2
        - Puma – Group 1
        - Imi – Group 2
        - Glyphosate

    - Dicamba resistant kochia in mid and western U.S.
    - Waterhemp resistance to 2,4-D documented

Available Sites of Action - By Crop

Site of Action (SOA number)			
Year 1		Year 2	
Corn PRE	Corn POST	Soybean PRE	Soybean POST
Group 2 (ALS)	2	Group 2 (ALS)	2
Group 4 (Dic/2,4-D)	4		
Group 5 (Atrazine)	5	Group 5 (Metribuzin)	[9]
	[9] RU	Group 14 (Balance)	14 (Flexstar)
Group 15 (Dual)	[10] Lib	Group 15 (Dual)	15
Group 27 (Calisto)	27	Group [27] (Balance)	
	[ ] = GMO		[ ] = GMO

Which increase risk of herbicide resistance?
Option 1: 2 or more applications same year in crop
Option 2: 1 application year 1 and one app in year 2, 3, 4…….

Dead weeds don't make seed!

Available Sites of Action - By Crop

Site of Action (SOA number)			
Year 1		**Year 2**	
Corn PRE	Corn POST	Soybean PRE	Soybean POST
Group 2 (ALS)	2	Group 2 (ALS)	2
Group 4 (Dic/2,4-D)	4	Group [4] (Dic/24-D)	[4]
Group 5 (Atrazine)	5	Group 5 (Metribuzin)	[9]
	[9] RU	Group 14 (Balance)	14 (Flexstar)
Group 15 (Dual)	[10] Lib	Group 15 (Dual)	15
Group 27 (Calisto)	27	Group [27] (Balance)	
	[ ] = GMO		[ ] = GMO

Which increase risk of herbicide resistance?
Option 1: 2 or more applications same year in crop
Option 2: 1 application each year

Dead weeds don't make seed!

12 Points about DR/DT Soybean

12. Crop rotation restrictions

- Previous degradation rule =

  45 days per pint = ~2.8 days / fl oz/A

<33 fl oz/A = wait 120 days (4 mo) to plant any crop

33 to 88 fl oz = wait 180 days (6 mo) to plant any crop

Do not count days when ground is frozen

Follow label crop rotation restrictions

12 Points about DR/DT Soybean

"All users are solely responsible for…damage"
- Grower uses at own risk

Read (study) label meticulously

*Don't read the label – Don't use the technology

Follow label perfectly


NDSU PLANT SCIENCES
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Agriculture is in our roots