



Arkansas State Plant Board

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Enforcement



Symptomology and Sampling for Investigations

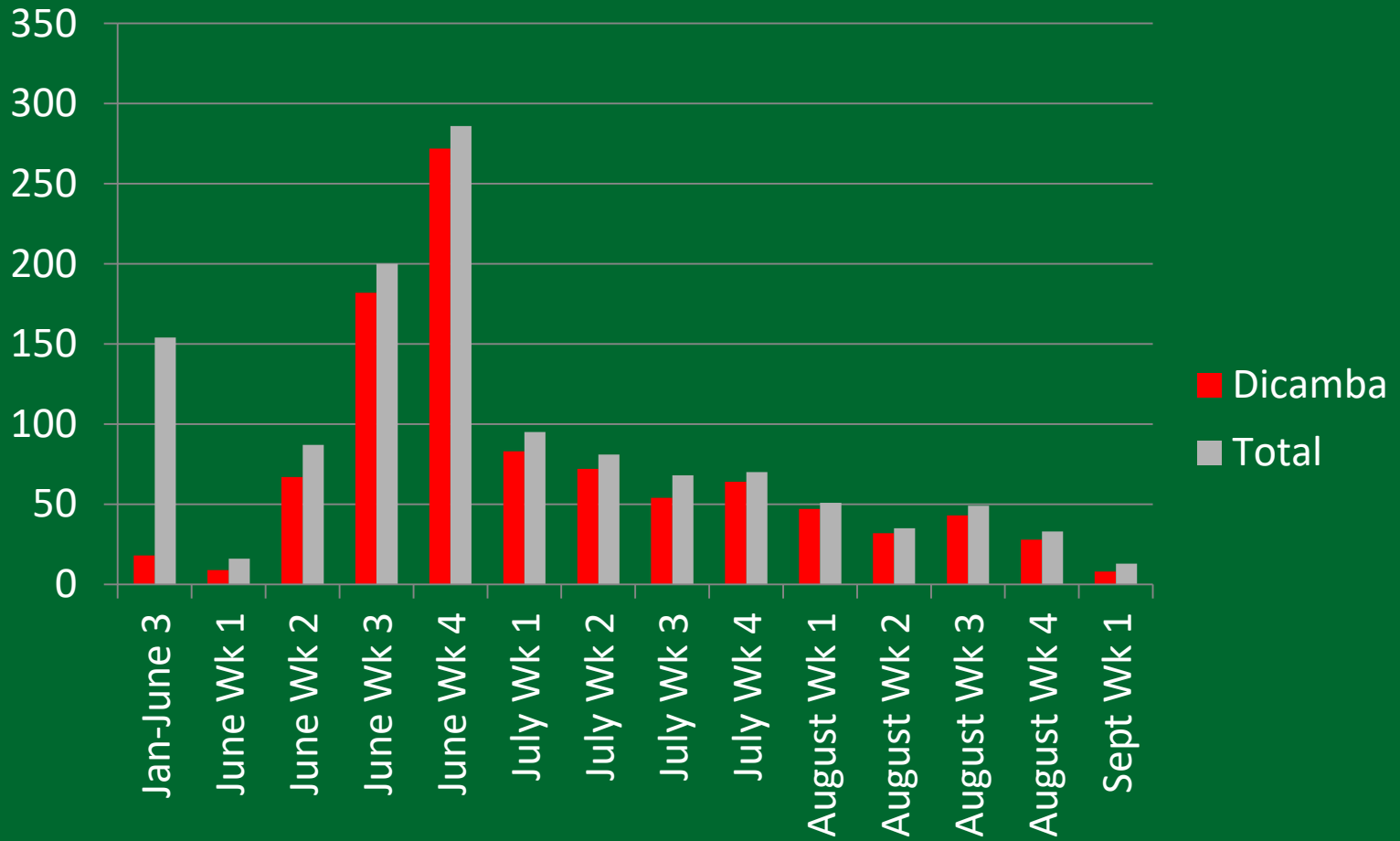


ASPB Complaint History

	2,4-D Complaints	Dicamba Complaints	Total Complaints
2000-2014	371	13	3830
2015	12	16	237
2016	11	32	274
2017	16	1014	1312
2018	23	200	456



2017 Complaints





What is Symptomology?

- Physical reaction of a plant to a herbicide
- Examples include: bleaching, blistering, chlorosis, cupping, curling, epinasty, necrosis, wilting, etc.
- Not all symptoms are caused by herbicide exposure some can be disease, insect injury, mechanical, soil fertility, environmental, etc.

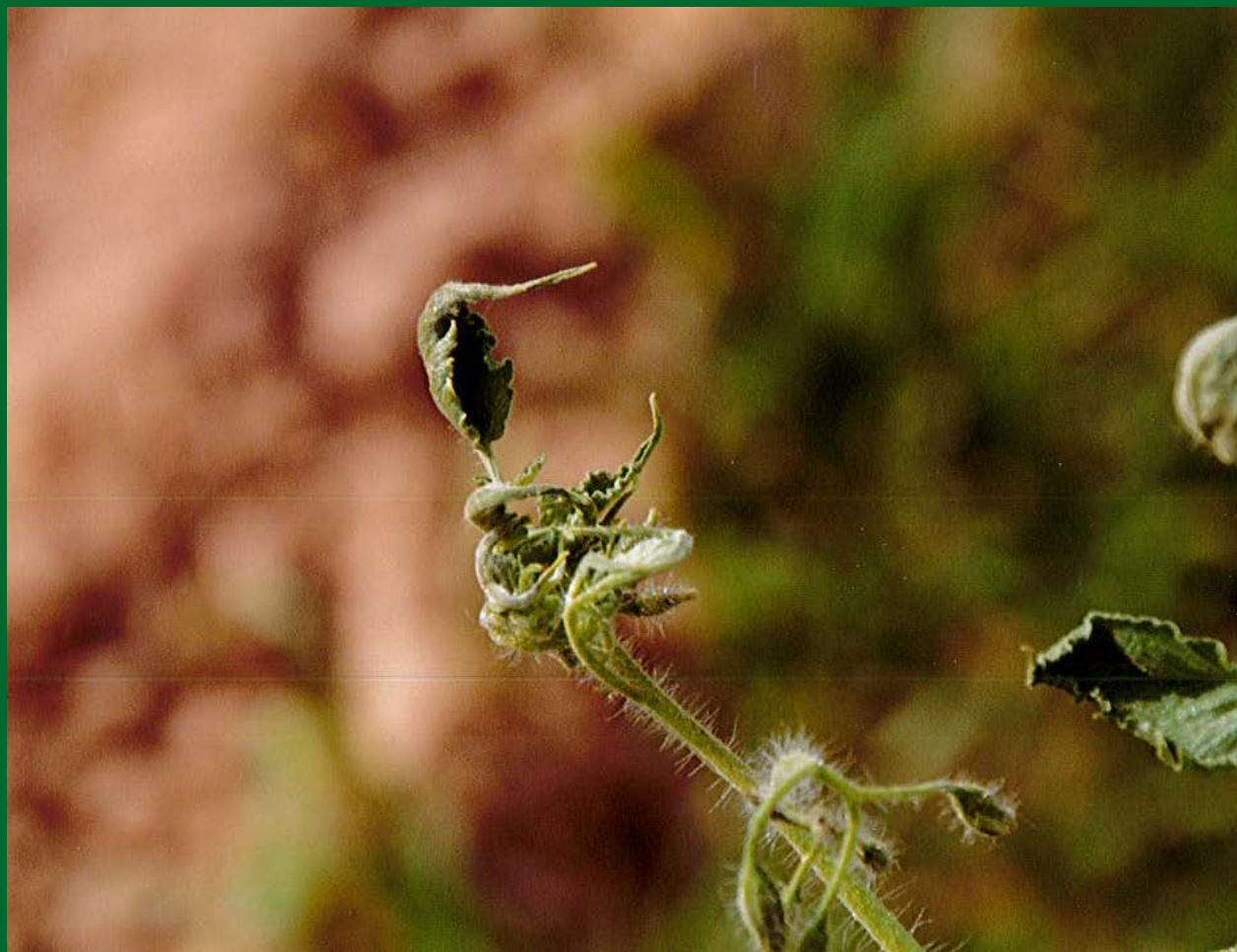
Dicamba Symptoms



Clomazone Symptoms



Quinclorac Symptoms



Paraquat Symptoms





Why Use Symptomology?

- Identify drift patterns within an area
- Show the visual effect of a herbicide
- Can be identified when samples may not detect
- Can be photo documented relatively quickly
- Assist in identifying source of the drift or direction of drift



Drift Pattern Example





Direction of Drift Example



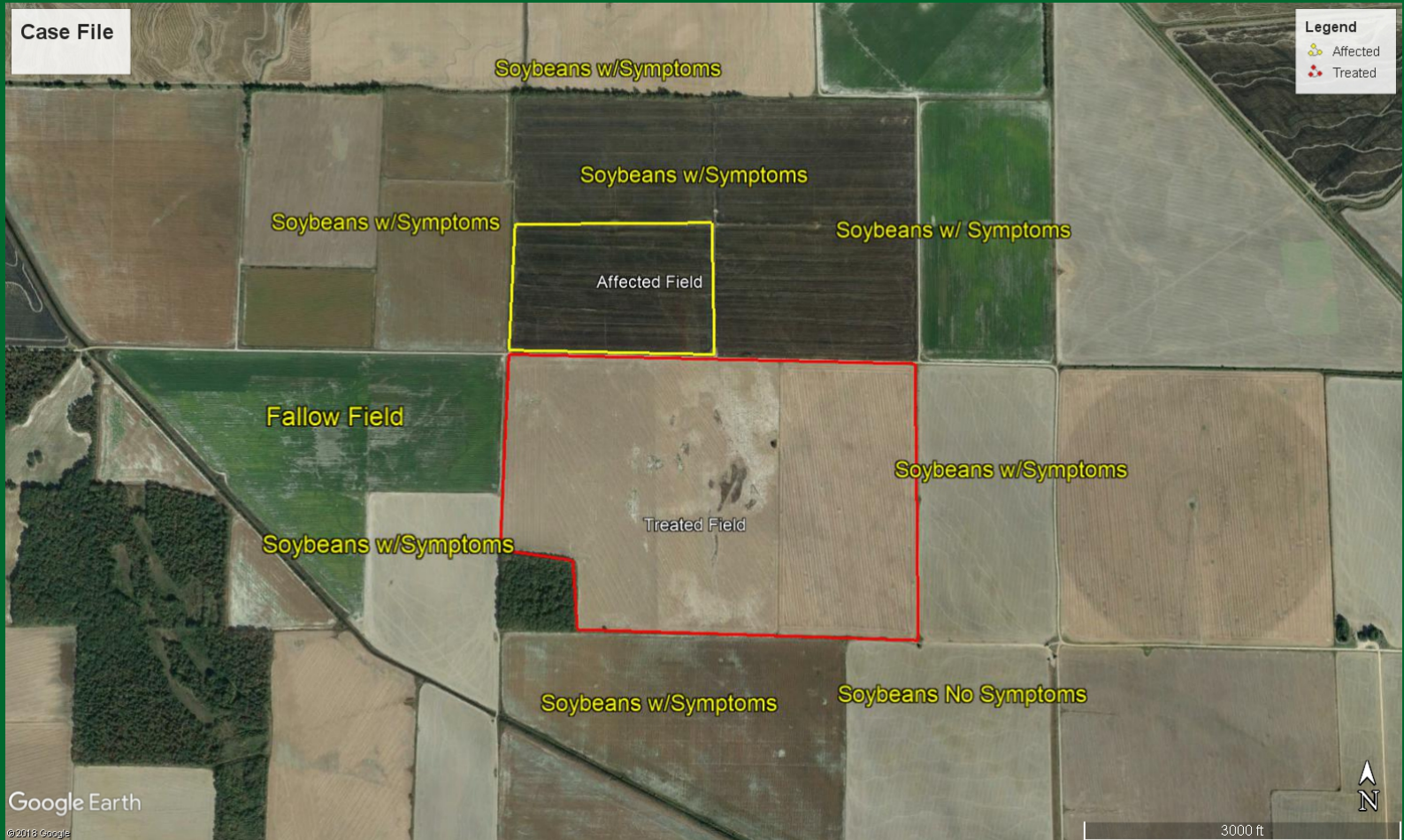


Tracking Drift Using Symptoms

- Tracking from Affected Field to Treated Source Field
- Identify the affected field
- Check all four sides of affected field for areas exhibiting symptoms
- Identify potential source fields
- Identify symptomology in areas between the affected and treated fields



Case File Map



Affected Field



Cupping Symptoms in Affected Field





Cupping Symptoms on South Edge of Affected Field



Cupping Symptoms in Ditch on South Edge of Affected Field





Affected Field on Left (North)



Epinasty Symptoms in Ditch on South Side of County Road



Epinasty Symptoms on Pigweed in Soybean Field South of County Road





Application and Dealer Records Check on Soybean Field

- Certified Applicator Records
 - Product Applied: Engenia (dicamba)
 - Treated Area: 156 Acres
 - Wind Direction: West
 - Wind Speed: 9 MPH
- RUP Dealer Records
 - Product Purchased: Engenia (dicamba)



Case Result Questions

- Do you think the symptoms in the affected field could have been caused by the product applied to the Soybean field to the South?
- Do you think we showed the drift from the treated field to the affected field?
- Do you think we proved a drift?
- Should we have sampled the pigweed or affected soybeans?



Why Use Samples?

- Definitive for active ingredients
- Can be used to distinguish between two products with similar symptomology
- Additional evidence for the symptomology observed
- Provide Proof for Human Exposures
- Provide Proof of Product Used in a treated area

Epinasty Symptoms on Pigweed





Pigweed Vegetation Sample Results

Date Sampled: 7/11/2018
Date Received: 7/13/2018
Date Reported: 7/23/2018

Inspector: STJ

Case File No.: 18-349

Sample Description: Vegetation

Lab No: 188183

Analytical Results

Ingredient	Found	Analyst
Dicamba	9.33 ppm	Miller

Epinasty Symptoms on Pigweed





Pigweed Vegetation Sample Results

Date Sampled: 6/9/2018

Date Received: 6/11/2018

Date Reported: 06/15/2018

Inspector: MWF

Case File No.: 18-152

Sample Description: Vegetation

Lab No: 188040

Analytical Results

Ingredient	Found	Analyst
Dicamba	104 ppb	Miller

Epinasty Symptoms on Pigweed





Pigweed Vegetation Sample Results

Date Sampled: 6/26/2018

Date Received: 6/26/2018

Date Reported: 7-6-18

Inspector: MWF

Case File No.: 18-247

Sample Description: Vegetation

Lab No: 188110

Analytical Results

Ingredient	Found	Analyst
Dicamba	No Detect	<i>muller</i>

No Symptoms on Vegetation





Vegetation Sample Results

Date Sampled: 3/14/2019

Date Received: 3/15/2019

Date Reported: 3/25/2019

Inspector: CDV

Case File No.: 19-004

Sample Description: Vegetation

Lab No: 198001

Analytical Results

Ingredient	Found	Analyst
2,4 D	13.1 ppb	Miller
Glyphosate Acid	No Detect	Miller



Unexpected Sample Results

- What if you have good symptomology but the sample doesn't detect the product?
- What if you have no symptomology and the sample detects a herbicide?



Conclusions

- Symptomology can be used to prove that a drift from one field to another occurred.
- Samples can be used to prove a specific product was applied to a field.
- The combination of symptomology and positive samples can improve your case.
- Unexpected sample results can cause confusion.



Questions??