DICAMBA DRIFT FROM XTEND BEANS – WHAT'S GOING ON?

Tom Wolf & Brian Caldwell Agrimetrix Research & Training, Saskatoon SK

Jason Deveau OMAFRA, Simcoe, ON Alberta Agronomy Update Jan 10, 2018

Sprayers 101 🗲



Herbicide Resistance

- Waterhemp (in ON, MB)
- Palmer amaranth (in Fargo, ND)
 - -Resistant to 6 MOA
- Kochia











It's déjà vu all over again

- However, dicamba presents a much greater hazard to nearby soybeans than 2,4-D. For that reason, the use of dicamba in Illinois has been discouraged.
- If dicamba is to be used, earlier treatments would be preferred to later ones.

Ellery Knake, UI, 1971

IOWA STATE UNIVERSITY Extension and Outreach Labelled sprayer application requirements for the Roundup Ready Xtend Crop System







Nozzles	Min. pressure 206 kPa (30 psi) Extremely Coarse - Ultra Coarse Miniumum 100 L/ha (~10 US g/ac)	Nozzles				
Sprayer	Drive <25 km/h (~15.5 mph) Boom 50 cm (~20 in.) or less above crop No aerial applications	Sprayer				
Environment	Be aware of nearby sensitive areas - If unsure, don't spray 15 m (~50 ft) buffer zone (b/c glyphosate) Wind <5 km/h (~3 mph) no inversion 5-15 km/h (~3-9 mph) Not during fog or temperature inversion Only when 10-25 °C (~50-77 °F) Not during high humidity Not when heavy rain predicted (run-off)					
Tank	Can tank mix (beware possible incompatibility) No acidifying buffering agents No AMS water conditioner No COC or MSO oils (unless specified on label, or tankmix partner label)					

Information based on current Canadian labels and changes anticipated by spring 2017

Dicamba Application on Soybeans (1 of 2)

- Extremely Coarse or Ultra Coarse
- Min 100 L/ha
- Max travel 15 mph
- Max 20" boom height
- No aerial











Spray Quality Categories

Category	Symbol	Color Code	Approximate Dv0.5 (VMD) (microns)
Extremely Fine	XF	Purple	≈50
Very Fine	VF	Red	<136
Fine	F	Orange	136-177
Medium	М	Yellow	177-218
Coarse	С	Blue	218-349
Very Coarse	VC	Green	349-428
Extremely Coarse	XC	White	428–622
Ultra Coarse	UC	Black	>622

AIXR TeeJet® (AIXR)



TeeJet XR 8003



TeeJet TT 11003 20 25 30 35 40 50 М 60 M 70 M 80 M 90 Back to start

Air Bubble Jet 11003





TeeJet AIXR 11003

TeeJet AI3070-03

TeeJet AI 11003











Droplets Within Spray Pattern



Larger Droplets, Lower Volume Smaller Droplets, Higher Volume Larger Droplets, Lower Volume



TeeJet AITTJ-60 11003

TeeJet TTI 11003





Hypro GA 11003

Hypro GAT 11003

Hypro ULD 11003





Back to start



Back to start

Greenleaf AirMix 11003



Greenleaf TDXL 11003



Greenleaf TADF 11003



Wilger SR11003



Wilger MR11003



Back to start

Wilger DR11003



USA: Permitted Tips and Pressures

			Operating Pressure (psi)							
Manufacturer	Nozzle Type	Part Number	10	20	30	40	50	60	70	
	TADF03-D	TADF03-D		Min 20		Max 40				
	TADF06-D	TADF06-D		Min 20	· · · · · · · · · · · · · · · · · · ·		Max 50			
Greenleaf	TDXL 11003-D	TDXL 11003-D		Min 20		Max 40				
Technologies	TDXL 11004-D	TDXL 11004-D		Min 20			Max 50			
	TDXL 11005-D	TDXL 11005-D		Min 20				Max 60		
	TDXL 11006-D	TDXL 11006-D		Min 20				Max 60		
Hypro	ULD120-04	ULD120-04 / FC-ULD120-04		Min 20		Max 40				
нурго	ULD120-05	ULD120-05 / FC-ULD120-05		Min 20		Max 40				
	AI11003	AI11003-VS / AIC1103-VS			Min 30	Max 40				
	AI8003	AI8003-VS / AIC8003-VS			Min 30	Max 40				
TeeJet® Technologies	AI8005	AI8005-VS / AIC8005-VS			Min 30	Max 40				
	TTI11003	TTI11003-VP		Min 20				Max 60		
	TTI11004	TTI11004-VP		Min 20			······	Max 63		
	TTI11005	TTI11005-VP		Min 20				Max 60		
	TTI11006	TTI11006-VP		Min 20			Max 50			
	DR110-10	40286-10	_		Min 30	Max 40				
	UR110-05	40292-05			Min 30		Max 50			
Wilger	UR110-06	40292-06			Min 30			Max 60		
	UR110-08	40292-08			Min 30			······	Max 70	
	UR110-10	40292-10			Min 30				Max 70	

Dicamba Application on Soybeans (2 of 2)

- 3 15 km/h wind
- No fog, high humidity, or inversions
- 10 25 C, <30 C forecast
- No AMS or fertilizers
- No acidifying additives



The US Situation

Record number of incidents

Record area affected

Record restrictions



Source: University of Missouri https://ipm.missouri.edu/IPCM/2017/10/final_report_dicamba_injured_soybean/



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Vapour Drift

- Active ingredient evaporates after application;
- Wet or dry deposit;
- Depends on inherent volatility of AI;
- Can occur 3+ days after application;
- Can move with wind or in inversions;
- Can be affected by moisture;
- Closely related to surface temperature.



Effect of adding Roundup PowerMax to Engenia on vapor losses under field conditions

Thomas C Mueller University of Tennessee

July, 2017





Field Volatility of Dicamba, Knoxville, TN June 2017



FOOD FOR THOUGHT

Monsanto Attacks Scientists After Studies Show Trouble For Weedkiller Dicamba

October 26, 2017 · 4:57 AM ET Heard on Morning Edition







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Dicamba Lawsuits Mounting

SEPTEMBER 13, 2017 10:49 AM

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How dicamba-court cases will play out in court remains a matter of conjecture, but one fact is clear: Dicamba-related litigation has only just begun.



Insurance Claims Denied as Companies Grapple with Dicamba Injury

Many farmers have had liability insurance claims denied over dicamba injury, after companies concluded the products were to blame. Know what your p... dtnpf.com

XtendiMax® With VaporGrip® Technology

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This webpage contains information for XtendiMax® With VaporGrip® Technology, including for use on Roundup Ready 2 Xtend® soybeans and cotton with XtendFlex® technology, according to the product labeling and the <u>terms and conditions</u> of the registration for XtendiMax® With VaporGrip® Technology.

Please ensure that you keep all applications records required by the <u>XtendiMax® With</u> <u>VaporGrip® Technology product labeling</u> and relevant state and federal law.

ALWAYS READ AND FOLLOW PESTICIDE PRODUCT LABELING. It is a violation of Federal and state law to use any pesticide product in a manner inconsistent with its labeling.

Restricted Status

Certified applicators only

Mandatory dicamba training

Record keeping (2 yrs)

Spray during daytime only

15 gpa

3-10 mph wind

110 ft buffer (22 oz rate)

Arkansas

- Stop sale July 11, 2017;
- No application between April 15 and Oct. 31 proposed;
- Monsanto sues AR.



Missouri

- Notice of application;
- Application between 7:30 and 17:30;
- No application after June 1 (bootheel), July 15.



Tennessee

- Application between 7:30 and 17:30;
- Hooded sprayer July 15 -Oct 1;
- No generic dicamba May 15 - Oct 1.



North Dakota

- No applications after June 1 or R1;
- Air temp <85 F;
- One hour after sunrise and before sunset;
- <12 mph travel speed;
- No 80 degree or less fan angles.



Questions

- Is application the problem?
- Is the product still too volatile?
- Can training solve these issues?
- What are the longterm implications for pesticides?





Atmospheric Conditions

Courtesy George Ramsey, DuPont

Richard Anderson (BASF) Inversion Videos



Richard Anderson (BASF) Inversion Videos



- Label very restrictive wrt droplet drift;
- US experience implicates vapour movement;
- Label silent on vapour drift;
- Some additives may increase volatility;
- Early and careful application NB.

General Operation Articles

The Misplay of our Generation

Nozzle_Guy Second Sprayers, Featured Article, General Operation, General Operation, Speciality Sprayers

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