



**Third party university trials show dicamba provides as good or better control of key broadleaf weeds compared to 2,4-D**

Postemergence University Rating, dicamba vs 2,4-D

| Weed Species                                      | Dicamba        | 2,4-D          |
|---|----------------|----------------|
| Black nightshade <sup>1,2,3,4,5,6,8</sup>         | Good           | Fair           |
| Common chickweed <sup>1,3,8,9,10</sup>            | Good           | Poor           |
| Kochia <sup>2,5,6</sup>                           | Good-Excellent | Fair           |
| Marestail <sup>1,2,3,5,7,8,9,10</sup>             | Good           | Fair-Good      |
| Smartweed <sup>1,2,3,4,5,6,7,8,9,10</sup>         | Good-Excellent | Poor-Fair      |
| Common cocklebur <sup>1,2,3,4,5,6,7,8,9,10</sup>  | Good-Excellent | Good-Excellent |
| Common lambsquarters <sup>1,2,3,4,5,6,7,8,9</sup> | Good-Excellent | Good-Excellent |
| Common ragweed <sup>1,2,3,4,5,6,7,8,10</sup>      | Good-Excellent | Good-Excellent |
| Palmer amaranth <sup>1,2,3,5,6,7,9</sup>          | Good           | Good           |
| Velvetleaf <sup>1,2,3,4,7,8,10</sup>              | Fair-Good      | Fair-Good      |
| Waterhemp <sup>1,2,3,4,5,6,9</sup>                | Good           | Good           |

■ Advantage over 2,4-D

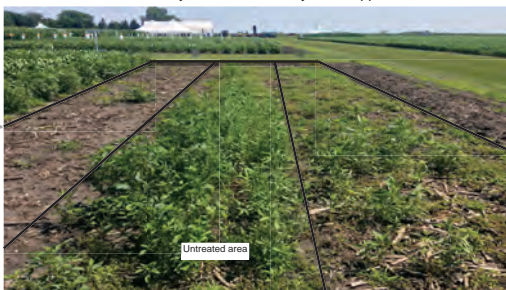
1 - 2017 Mid-Atlantic Field Crop Weed Management Guide (Perry State University, University of Delaware, University of Maryland, Rutgers, Virginia Tech, West Virginia University); 2 - 2018 Ohio, Indiana, and Illinois Weed Control Guide (Ohio State University, Purdue University, University of Illinois); 3 - 2018 Michigan Weed Control Guide for Field Crops (Michigan State University); 4 - 2018 Herbicide Guide for Insect Corn and Soybean Production (Iowa State University); 5 - 2019 North Dakota Weed Control Guide (North Dakota State University); 6 - 2019 Kansas Cornfields (Weed Control for Field Crops - Nebraska, Rangebirds, and Horticultural) (Kansas State University); 7 - 2019 Nebraska Recommended Chemicals for Insect and Brush Control (University of Tennessee); 8 - 2019 Insect Management Suggestions for Mississippi Row Crops (Mississippi State University); 9 - 2018 South Carolina Pest Management Handbook (Clemson University)

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**14 Day Soil Activity Matters - Keep Fields Clean Longer**

Mapleton, MN - 2019 Bare ground demo with Waterhemp, Pigweed, Common Purslane

Picture taken July 25, 2019 - 34 Days after application



Untreated area



XtendMax<sup>®</sup> herbicide with VaporGrip<sup>®</sup> Technology 22 fl oz Roundup PowerMAX<sup>®</sup> 32 fl oz Ignite<sup>®</sup> 0.25% v/v Class Act<sup>®</sup> Ridon 1% v/v



Enlist Duo<sup>™</sup> herbicide 56 fl oz AMS 1% v/v

**Comparison of Xtendimax and Enlist One Application Requirements**

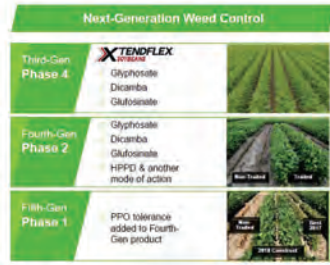
| Category                          | XtendiMax       | Enlist One   |
|-----------------------------------|-----------------|--------------|
| Use Rate                          | 22 oz/a         | 32 oz/a      |
| Crop Stage                        | R1              | R2           |
| AMS                               | Do Not Use      | Recommended  |
| Spray Volume                      | >15 gpa         | 10-15 gpa    |
| Weed Size                         | < 4 inches      | < 6 inches   |
| Wind Blowing to Susceptible Crop? | Do Not Spray    | Do Not Spray |
| Downwind Buffer                   | 110 or 220 feet | 30 feet      |
| Wind Speed                        | 3-10 mph        | 3-10 mph     |
| Boom Height                       | < 24"           | < 24"        |
| Number of Nozzles Labeled (17)    | 36              | 48           |
| Documentation Needed?             | Required        | Recommended  |
| Sprayer Cleanout                  | Triple Rinse    | Triple Rinse |



# XtendFlex SOYBEANS

## Key Initiatives

1. Completion of **regulatory** process – targeting Spring 2020
2. Successful positioning of **XtendFlex soybeans** vs. competition
3. Increase breadth and depth of **XtendFlex germplasm**



# 2018 XtendiMax® Herbicide with VaporGrip® Technology Demonstration

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\*Commercialization of XtendFlex soybeans is dependent on multiple factors, including successful conclusion of the regulatory process. The information presented herein is provided for educational purposes only, and is not and shall not be construed as an offer to sell, or a recommendation to use, any unregistered pesticide for any purpose whatsoever. It is a violation of federal law to promote or offer to sell an unregistered pesticide.

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## Baltic, SD XtendiMax® Herbicide with VaporGrip® Technology Demonstration

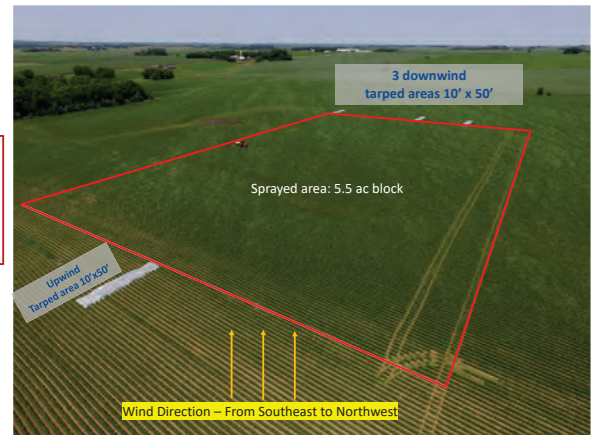
This demonstration was designed to show the off-target movement (OTM) potential of XtendiMax® with VaporGrip® when applied to large areas. The 110-foot downwind buffer was not used in order to demonstrate the importance of the buffer and not spraying when sensitive crops are downwind. Applications otherwise were consistent with the XtendiMax® Herbicide with VaporGrip® Technology label that was in effect during the 2018 growing season. A tank mixture of XtendiMax® Herbicide with VaporGrip® Technology +Roundup PowerMAX® + INTACT™ drift retardant agent was applied in an application volume of 15 GPA (gallon per acre) from a commercial sized sprayer traveling no more than 15 MPH (mile per hour).

1. 5.5 acre block in a field of Genuity® Roundup Ready 2 Yield® soybeans, not dicamba-tolerant soybeans.
2. XtendiMax® Herbicide with VaporGrip® Technology was tank mixed with Roundup PowerMAX® Herbicide and INTACT™ drift retardant agent. Application was made on July 6, 2018 with a SE wind a 8 mph and 82° F temperature.
3. Weather after application was S to SE wind for 4 days and temperatures in the 90's.
4. Symptoms were observed outside of the sprayed area in the downwind portion of the field out to a maximum of roughly 75 feet, which is within the 110-foot downwind buffer required by the label.
5. No symptoms on the upwind side except plants that were inadvertently oversprayed.
6. The downwind tarped areas didn't show a significant difference in plant height compared to the non-tarped area. Cupping symptoms were observed on plants under the tarps, but less than the non-tarped downwind area. We were unable to confirm that the tarps were 100% effective in restricting the particle movement from the spray application.



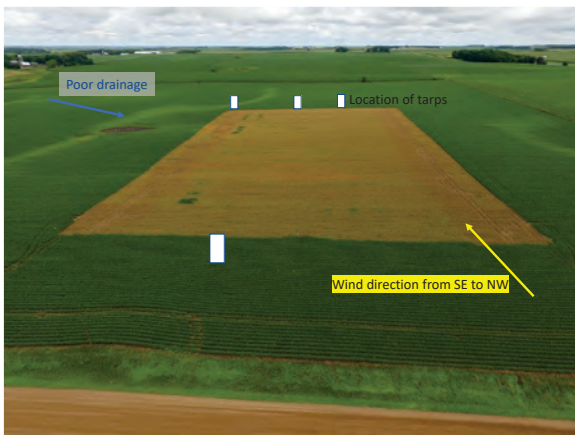
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Field during application on July 6, 2018 at 18" above canopy facing northwest  
Canopy shows wind direction



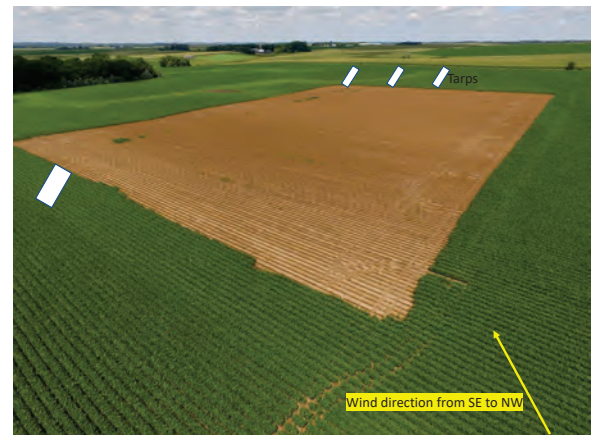
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1 week after application



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2 weeks after application



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24 days after application on upwind side of trial; symptomatology is limited to plants that were oversprayed



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Weed control 24 days after application

2 pass application program used.



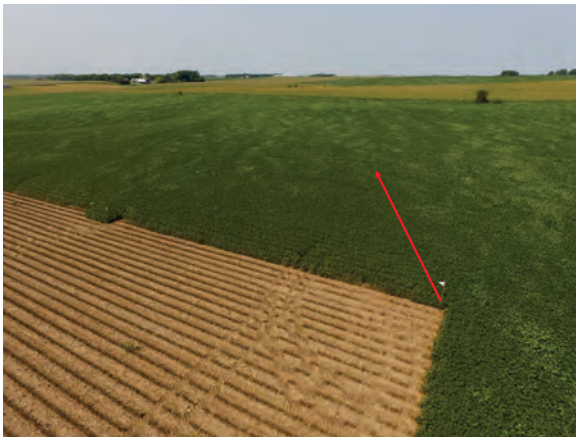
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Downwind side 50 days after application

-Red line indicates wind direction at time of application.

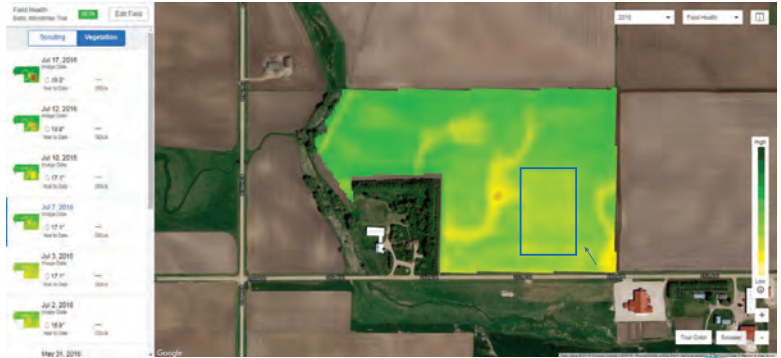
-Left of the red line leaves are cupped due to drift from XtendiMax® Herbicide with VaporGrip® Technology

-Cupping symptoms can be seen anywhere the canopy shows a consistent dark color



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July 7, 2018 – 1 day after application



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July 10, 2018 – 4 days after application



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July 17, 2018 – 11 days after application



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## Yield Results harvested 10/20/18

Each yield check was 15 feet wide and parallel to the edge of the sprayed area

|               |
|---------------|
| 66.9 bu/acre  |
| 67.6 bu/acre  |
| 68.4 bu/acre  |
| 68.5 bu/acre  |
| 69.3 bu/acre  |
| 69.1 bu/acre  |
| 69.2 bu/acre  |
| 67.7 bu/acre* |
| 70.2 bu/acre  |

soil too wet to harvest - no yield check

Sprayed Area

63.7 bu/acre  
64.1 bu/acre

Upwind side of trial - no yield check

\* harvested traveling east, the other yield checks were harvested traveling west



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## Videos:

2018 XtendiMax® Herbicide with VaporGrip® Technology Large Scale Drift Trial in Baltic, SD

During Application – Wind Direction During Application

<https://youtu.be/rLLmk0c1pl>

During Application – View from Behind the Sprayer

<https://youtu.be/Ol1xlzGlaPc>

25 Days After Application – Flight Around the Trial

[https://youtu.be/Tzn\\_HnwcDd0](https://youtu.be/Tzn_HnwcDd0)

50 Days After Application – Downwind Side of Trial

<https://youtu.be/VP8Ptt1UDw>



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## 2018 Dicamba Field Trials & University Research

### Multi-Year Integrated Weed Management Academic Trials

- Supporting research trials at 21 universities (\$1.5M in grants)
- Trials related to integrated weed management including role of dicamba

### Large-Scale Drift and Volatility Academic Trials

- Collaborating with 12 university programs across the U.S. and Canada
- Conducting research on our current and future dicamba formulations
- Generate localized data & more knowledge about low-volatility dicamba

[FIELD TRIAL PROTOCOL](#)

### Internal GLP Field Trials

- Wide range of realistic weather conditions and soil types
- Highlight the three-step process for evaluating volatility

[WORTH BAKOTA FIELD TRIAL](#)



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## Backup Slides

## Roundup/Glyphosate Litigation – Why Now?

- In March 2015, the International Agency for Research on Cancer (IARC) classified glyphosate as "probably carcinogenic to humans" (Group 2A). IARC is a division of the World Health Organization (WHO).
- The IARC classification of glyphosate is based on "limited" evidence of cancer in humans and "sufficient" evidence of cancer in experimental animals
- Group 2A has 82 agents including:
  - Burning wood, emissions from high temperature frying, exposure as a hairdresser or barber, night shift work, consumption of red meat, drinking very hot drinks (over 150F)
  - Malathion, diazinon, and others
- Group 1 (carcinogenic to humans) has 111 agents including:
  - Alcoholic beverages, diesel engine exhaust, leather dust, outdoor air pollution, solar radiation, wood dust

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## Is Roundup/Glyphosate Safe?

1. Farmers, gardeners, governments, and others have safely used glyphosate for more than 40 years
2. Over 800 studies by regulators confirm that glyphosate products are safe to use. This includes multiple governments agencies in North America, Europe, and abroad.
3. Not carcinogenic – The 2018 independent National Cancer Institute study followed over 50,000 pesticide applicators for more than 20 years. The study found no association between glyphosate based herbicides and cancer.
4. These leading regulators and agencies concluded that glyphosate is not carcinogenic:
  - US Environmental Protection Agency as recently as April 2019
  - European Food Safety Authorities
  - European Chemicals Agency
  - German, Australian, Canadian, Korean, New Zealand, and Japanese authorities

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## Resources

Search YouTube for Give it a Minute: Glyphosate

[Give It A Minute: Glyphosate](#)

Also visit [www.bayer.com/glyphosate](http://www.bayer.com/glyphosate)

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