

Purdue Weed Science

Evaluation of PRE Herbicides in Xtend Soybean

Trial ID: 16S-MED-SOY-08 Location: Medaryville Trial Year: 2016
 Protocol ID: 16S-MED-SOY-08 Investigator: Dr. Bill Johnson
 Project ID: MKD H 2016 US D88 Study Director: Joe Ikley
 Sponsor Contact: BASF - Gery Welker

General Trial Information

Study Director: Joe Ikley **Title:** Research Associate
Investigator: Dr. Bill Johnson **Title:** Professor

Conducted Under GLP: No
Conducted Under GEP: No

Contacts

Study Director: Joe Ikley **Title:** Research Associate
Organization: Purdue University
Address: 915 West State Street **Phone No.:** 765-494-0891
City+State/Prov: West Lafayette **Mobile No.:** 410-596-9091
Postal Code: 47907 **E-mail:** jikley@purdue.edu

Investigator: Dr. Bill Johnson **Title:** Professor
Organization: Purdue University
Address: 915 West State Street **Phone No.:** 765-494-4656
City+State/Prov: West Lafayette **Mobile No.:** 765-404-9801
Postal Code: 47907 **E-mail:** wgj@purdue.edu

Crop Description

Crop 1: GLXMA Glycine max
Variety: AG 30X6
Description: XTEND

Planting Rate, Unit: 1400000 S/A
Depth, Unit: 1.5 IN
Row Spacing, Unit: 30 IN
Soil Temperature, Unit: 55 F
Soil Moisture: NORMAL normal, adequate

Planting Date: May-19-2016
Planting Method: PLANTD planted
Planting Equipment: PP Plot Planter
Emergence Date: May-27-2016

Pest Description

Pest 1 Type: W **Code:** AMAPA *Amaranthus palmeri*
Common Name: Carelessweed

Site and Design

Treated Plot Width: 10 FT
Treated Plot Length: 30 FT
Treated Plot Area: 300 FT² **Treatments:** 10
Replications: 4

Site Type: FIELD field
Experimental Unit: 1 PLOT plot
Tillage Type: NOTILL no-till
Study Design: RACOB� Randomized Complete Block (RCB)

Field Prep./Maintenance:

Gramoxone Max Applied at 3.5 pt/A on 5/18/16

Soil Description

Description Name: MEDARYVILLE
% Sand: 84.5 **% OM:** 5.6 **Texture:** LS loamy sand
% Silt: 12.8 **pH:** 6.7
% Clay: 2.7 **CEC:** 13.6 **Fert. Level:** G good
Soil Drainage: G good

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| | |
|-------------------------------|--|
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Application Description

| | A | B |
|--------------------------------|-------------|-------------|
| Application Date: | May-19-2016 | Jun-13-2016 |
| Appl. Start Time: | 12:00 PM | 1:45 PM |
| Appl. Stop Time: | 12:30 PM | 2:15 PM |
| Application Method: | SPRAY | SPRAY |
| Application Timing: | PRE | M POST |
| Application Placement: | BROADC | BROADC |
| Applied By: | PD | JI |
| Air Temperature, Unit: | 67 F | 84 F |
| % Relative Humidity: | 25 | 25 |
| Wind Velocity, Unit: | 2 MPH | 1 MPH |
| Wind Direction: | NE | SSE |
| Dew Presence (Y/N): | N no | N no |
| Soil Temperature, Unit: | 60 F | 75 F |
| Soil Moisture: | NORMAL | DRY |
| % Cloud Cover: | 10 | 0 |

Crop Stage At Each Application

| | A | B |
|---------------------------------|------------|------------|
| Crop 1 Code, BBCH Scale: | GLXMA BSOY | GLXMA BSOY |
| Stage Scale Used: | | BBCH |
| Stage Majority, Percent: | | 14 |
| Stage Minimum, Percent: | | 13 |
| Stage Maximum, Percent: | | 14 |
| Height, Unit: | | 5 IN |
| Height Minimum, Maximum: | | 4 6 |

Pest Stage At Each Application

| | A | B |
|----------------------------------|---------|---------|
| Pest 1 Code, Type, Scale: | AMAPA W | AMAPA W |
| Stage Majority, Percent: | | 33G |
| Stage Minimum, Percent: | | 31G |
| Stage Maximum, Percent: | | 36G |
| Height, Unit: | | 5 IN |
| Height Minimum, Maximum: | | 1 9 |
| Density, Unit: | | 150 YD2 |

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Application Equipment

| | A | B |
|----------------------------------|--------------|--------------|
| Appl. Equipment: | CO2 BACKPACK | CO2 BACKPACK |
| Equipment Type: | BACSPR | BACSPR |
| Operation Pressure, Unit: | 18 PSI | 18 PSI |
| Nozzle Type: | FLAT FAN | TTI |
| Nozzle Size: | XR 11002 | 110015 |
| Nozzle Spacing, Unit: | 15 IN | 15 IN |
| Nozzles/Row: | 8 | 8 |
| Boom Length, Unit: | 10 FT | 10 FT |
| Boom Height, Unit: | 17 IN | 17 IN |
| Ground Speed, Unit: | 3 MPH | 3 MPH |
| Carrier: | MEIGS | MEIGS |
| Spray Volume, Unit: | 15 gal/ac | 15 gal/ac |
| Mix Size, Unit: | 1.8 liters | 1.8 liters |
| Propellant: | CO2 | CO2 |

Trial Comments

Reps: 4 Plots: 10 by 30 feet
 Spray vol: 15 GAL/AC Mix Size: 1.8 liters (calculated mix size 1.5642)

| Trt No. | Treatment Name | Form | | Form Type | Rate Unit | Appl Code | Amt Product to Measure | Rep 1 | Rep 2 | Rep 3 | Rep 4 |
|---------|------------------|--------------|-----------|-----------|----------------|-----------|------------------------|-------|-------|-------|-------|
| | | Form Conc | Form Unit | | | | | | | | |
| 1 | Untreated Check | | | | | | | 101 | 402 | 602 | 801 |
| 2 | ENGENIA | 5 LB/GAL | SL | | 12.8 fl oz/a B | | 12.0 ml/mx | 102 | 403 | 601 | 804 |
| | ROUNDUP POWERMAX | 4.5 LBAE/GAL | SL | | 32 fl oz/a B | | 30.0 ml/mx | | | | |
| 3 | VERDICT | 5.57 LB/GAL | EC | | 5 fl oz/a A | | 4.687 ml/mx | 103 | 303 | 501 | 703 |
| | ENGENIA | 5 LB/GAL | SL | | 12.8 fl oz/a B | | 12.0 ml/mx | | | | |
| | ROUNDUP POWERMAX | 4.5 LBAE/GAL | SL | | 32 fl oz/a B | | 30.0 ml/mx | | | | |
| 4 | OPTILL | 68 % | WG | | 2 oz/a A | | 1.797 g/mx | 104 | 405 | 603 | 805 |
| | ENGENIA | 5 LB/GAL | SL | | 12.8 fl oz/a B | | 12.0 ml/mx | | | | |
| | ROUNDUP POWERMAX | 4.5 LBAE/GAL | SL | | 32 fl oz/a B | | 30.0 ml/mx | | | | |
| 5 | VERDICT | 5.57 LB/GAL | EC | | 5 fl oz/a A | | 4.687 ml/mx | 105 | 304 | 505 | 702 |
| | OUTLOOK | 6 LB/GAL | EC | | 5 fl oz/a A | | 4.687 ml/mx | | | | |
| | ENGENIA | 5 LB/GAL | SL | | 12.8 fl oz/a B | | 12.0 ml/mx | | | | |
| | ROUNDUP POWERMAX | 4.5 LBAE/GAL | SL | | 32 fl oz/a B | | 30.0 ml/mx | | | | |
| 6 | ZIDUA PRO | 4.09 LB/GAL | SC | | 4.5 fl oz/a A | | 4.219 ml/mx | 201 | 404 | 502 | 803 |
| | ENGENIA | 5 LB/GAL | SL | | 12.8 fl oz/a B | | 12.0 ml/mx | | | | |
| | ROUNDUP POWERMAX | 4.5 LBAE/GAL | SL | | 32 fl oz/a B | | 30.0 ml/mx | | | | |
| 7 | ZIDUA PRO | 4.09 LB/GAL | SC | | 6 fl oz/a A | | 5.625 ml/mx | 202 | 305 | 504 | 701 |
| | ENGENIA | 5 LB/GAL | SL | | 12.8 fl oz/a B | | 12.0 ml/mx | | | | |
| | ROUNDUP POWERMAX | 4.5 LBAE/GAL | SL | | 32 fl oz/a B | | 30.0 ml/mx | | | | |
| 8 | ZIDUA SC | 4.17 LB/GAL | SC | | 3.25 fl oz/a A | | 3.047 ml/mx | 203 | 401 | 604 | 802 |
| | ENGENIA | 5 LB/GAL | SL | | 12.8 fl oz/a B | | 12.0 ml/mx | | | | |
| | ROUNDUP POWERMAX | 4.5 LBAE/GAL | SL | | 32 fl oz/a B | | 30.0 ml/mx | | | | |
| 9 | VERDICT | 5.57 LB/GAL | EC | | 5 fl oz/a A | | 4.687 ml/mx | 204 | 302 | 503 | 705 |
| | ZIDUA SC | 4.17 LB/GAL | SC | | 3.25 fl oz/a A | | 3.047 ml/mx | | | | |
| | ENGENIA | 5 LB/GAL | SL | | 12.8 fl oz/a B | | 12.0 ml/mx | | | | |
| | ROUNDUP POWERMAX | 4.5 LBAE/GAL | SL | | 32 fl oz/a B | | 30.0 ml/mx | | | | |
| 10 | SONIC | 70 % | WG | | 5 oz/a A | | 4.493 g/mx | 205 | 301 | 605 | 704 |
| | ENGENIA | 5 LB/GAL | SL | | 12.8 fl oz/a B | | 12.0 ml/mx | | | | |
| | ROUNDUP POWERMAX | 4.5 LBAE/GAL | SL | | 32 fl oz/a B | | 30.0 ml/mx | | | | |

Sort Order: Replicate 1

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| | |
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Reps: 4 Plots: 10 by 30 feet
 Spray vol: 15 GAL/AC Mix Size: 1.8 liters (calculated mix size 1.5642)
 Product quantities required for listed treatments and applications of trials included in this table:

| Amount* | Unit | Treatment Name | Form Conc | Form Type | Lot Code |
|---------|------|------------------|-----------|-----------|----------|
| 135.000 | ml | ENGENIA | 5 | SL | |
| 337.500 | ml | ROUNDUP POWERMAX | 4.5 | SL | |
| 17.578 | ml | VERDICT | 5.57 | EC | |
| 2.247 | g | OPTILL | 68 | WG | |
| 5.859 | ml | OUTLOOK | 6 | EC | |
| 12.305 | ml | ZIDUA PRO | 4.09 | SC | |
| 7.617 | ml | ZIDUA SC | 4.17 | SC | |
| 5.617 | g | SONIC | 70 | WG | |

* 'Per area' calculations based on spray volume= 15 GAL/AC, mix size= 1.8 liters (mix size basis).

* Product amount calculations increased 25 % for overage adjustment.

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| Pest Type | | W Weed | | W Weed | W Weed | W Weed | | |
|-------------------------------|----------------|--------------|-------------|--------------|--------------|--------------|-----|----|
| Pest Code | | AMAPA | | AMAPA | AMAPA | AMAPA | | |
| Pest Name | | Carelessweed | | Carelessweed | Carelessweed | Carelessweed | | |
| Crop Code | GLXMA | | GLXMA | | | | | |
| Crop Name | Soybean | | Soybean | | | | | |
| Description | | | | | FRONT HALF | BACK HALF | | |
| Part Rated | PLOT C | PLOT P | PLOT C | PLOT P | PLOT P | PLOT P | | |
| Rating Date | Jun-2-2016 | Jun-2-2016 | Jun-13-2016 | Jun-13-2016 | Jun-27-2016 | Jun-27-2016 | | |
| Rating Type | PHYGEN | CONTRO | PHYGEN | CONTRO | CONTRO | CONTRO | | |
| Rating Unit | % | % | % | % | % | % | | |
| Number of Subsamples | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Days After First/Last Applic. | 14 14 | 14 14 | 25 25 | 25 25 | 39 14 | 39 14 | | |
| Trt-Eval Interval | 14 DA-A | 14 DA-A | 0 DA-B | 0 DA-B | 14 DA-B | 14 DA-B | | |
| Days After Emergence | 6 DE-1 | 6 DE-1 | 17 DE-1 | 17 DE-1 | 31 DE-1 | 31 DE-1 | | |
| ARM Action Codes | P | P | P | P | P | P | | |
| Number of Decimals | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Trt Treatment | Rate | Appl | | | | | | |
| No. Name | Rate Unit | Code Plot | 1 | 2 | 3 | 4 | 5 | 6 |
| 1 Untreated Check | | 101 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 402 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 602 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 801 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Mean = | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 ENGENIA | 12.8 fl oz/a B | 102 | 0 | 0 | 0 | 0 | 60 | 0 |
| ROUNDUP POWERMAX | 32 fl oz/a B | 403 | 0 | 0 | 0 | 0 | 85 | 0 |
| | | 601 | 0 | 0 | 0 | 0 | 80 | 0 |
| | | 804 | 0 | 0 | 0 | 0 | 85 | 0 |
| | | Mean = | 0 | 0 | 0 | 0 | 78 | 0 |
| 3 VERDICT | 5 fl oz/a A | 103 | 0 | 80 | 0 | 35 | 95 | 10 |
| ENGENIA | 12.8 fl oz/a B | 303 | 0 | 100 | 0 | 90 | 100 | 90 |
| ROUNDUP POWERMAX | 32 fl oz/a B | 501 | 0 | 70 | 0 | 50 | 95 | 0 |
| | | 703 | 0 | 50 | 5 | 50 | 95 | . |
| | | Mean = | 0 | 75 | 1 | 56 | 96 | 33 |
| 4 OPTILL | 2 oz/a A | 104 | 0 | 30 | 0 | 10 | 85 | 10 |
| ENGENIA | 12.8 fl oz/a B | 405 | 0 | 30 | 0 | 10 | 95 | 0 |
| ROUNDUP POWERMAX | 32 fl oz/a B | 603 | 0 | 30 | 5 | 50 | 95 | 0 |
| | | 805 | 0 | 50 | 0 | 20 | 75 | 0 |
| | | Mean = | 0 | 35 | 1 | 23 | 88 | 3 |
| 5 VERDICT | 5 fl oz/a A | 105 | 0 | 85 | 0 | 40 | 90 | 10 |
| OUTLOOK | 5 fl oz/a A | 304 | 0 | 95 | 0 | 90 | 100 | 20 |
| ENGENIA | 12.8 fl oz/a B | 505 | 0 | 90 | 0 | 90 | 100 | 70 |
| ROUNDUP POWERMAX | 32 fl oz/a B | 702 | 0 | 70 | 0 | 60 | 90 | 15 |
| | | Mean = | 0 | 85 | 0 | 70 | 95 | 29 |
| 6 ZIDUA PRO | 4.5 fl oz/a A | 201 | 0 | 95 | 0 | 90 | 95 | 20 |
| ENGENIA | 12.8 fl oz/a B | 404 | 0 | 95 | 0 | 90 | 100 | 35 |
| ROUNDUP POWERMAX | 32 fl oz/a B | 502 | 0 | 85 | 0 | 85 | 99 | 0 |
| | | 803 | 0 | 85 | 0 | 85 | 95 | 60 |
| | | Mean = | 0 | 90 | 0 | 88 | 97 | 29 |
| 7 ZIDUA PRO | 6 fl oz/a A | 202 | 0 | 99 | 0 | 90 | 99 | 70 |
| ENGENIA | 12.8 fl oz/a B | 305 | 0 | 100 | 0 | 90 | 100 | 80 |
| ROUNDUP POWERMAX | 32 fl oz/a B | 504 | 0 | 100 | 0 | 90 | 100 | 70 |
| | | 701 | 0 | 85 | 0 | 60 | 95 | 20 |
| | | Mean = | 0 | 96 | 0 | 83 | 99 | 60 |
| 8 ZIDUA SC | 3.25 fl oz/a A | 203 | 0 | 95 | 0 | 75 | 95 | 80 |
| ENGENIA | 12.8 fl oz/a B | 401 | 0 | 99 | 0 | 90 | 99 | 80 |
| ROUNDUP POWERMAX | 32 fl oz/a B | 604 | 0 | 95 | 0 | 95 | 99 | 50 |
| | | 802 | 0 | 90 | 0 | 85 | 95 | 60 |
| | | Mean = | 0 | 95 | 0 | 86 | 97 | 68 |
| 9 VERDICT | 5 fl oz/a A | 204 | 0 | 90 | 0 | 60 | 99 | 70 |
| ZIDUA SC | 3.25 fl oz/a A | 302 | 0 | 100 | 0 | 95 | 100 | 85 |
| ENGENIA | 12.8 fl oz/a B | 503 | 0 | 100 | 0 | 90 | 100 | 70 |
| ROUNDUP POWERMAX | 32 fl oz/a B | 705 | 0 | 95 | 0 | 90 | 95 | 60 |
| | | Mean = | 0 | 96 | 0 | 84 | 99 | 71 |

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 Project ID: MKD H 2016 US D88 Study Director: Joe Ikley
 Sponsor Contact: BASF - Gery Welker

| Pest Type | Pest Code | W Weed | | W Weed | | W Weed | | W Weed | | | | | | |
|-------------------------------|-------------------------------|------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|------|------|------|------|------|
| | | AMAPA | Carelessweed | AMAPA | Carelessweed | AMAPA | Carelessweed | AMAPA | Carelessweed | | | | | |
| Pest Name | Crop Code | GLXMA | GLXMA | GLXMA | GLXMA | GLXMA | GLXMA | GLXMA | GLXMA | | | | | |
| Crop Name | Description | Soybean | Soybean | Soybean | Soybean | FRONT HALF | FRONT HALF | BACK HALF | BACK HALF | | | | | |
| Part Rated | Rating Date | PLOT C | PLOT P | PLOT C | PLOT P | PLOT P | PLOT P | PLOT P | PLOT P | | | | | |
| Rating Type | Rating Date | Jun-2-2016 | Jun-2-2016 | Jun-13-2016 | Jun-13-2016 | Jun-27-2016 | Jun-27-2016 | Jun-27-2016 | Jun-27-2016 | | | | | |
| Rating Unit | Rating Type | PHYGEN | CONTRO | PHYGEN | CONTRO | CONTRO | CONTRO | CONTRO | CONTRO | | | | | |
| Number of Subsamples | Rating Unit | % | % | % | % | % | % | % | % | | | | | |
| Days After First/Last Applic. | Number of Subsamples | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | |
| Trt-Eval Interval | Days After First/Last Applic. | 14 14 | 14 14 | 25 25 | 25 25 | 39 14 | 39 14 | 39 14 | 39 14 | | | | | |
| Days After Emergence | Trt-Eval Interval | 14 DA-A | 14 DA-A | 0 DA-B | 0 DA-B | 14 DA-B | 14 DA-B | 14 DA-B | 14 DA-B | | | | | |
| ARM Action Codes | Days After Emergence | 6 DE-1 | 6 DE-1 | 17 DE-1 | 17 DE-1 | 31 DE-1 | 31 DE-1 | 31 DE-1 | 31 DE-1 | | | | | |
| Number of Decimals | ARM Action Codes | P | P | P | P | P | P | P | P | | | | | |
| | Number of Decimals | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| Trt Treatment | Rate | Appl | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| No. Name | Rate | Unit | Code | Plot | Plot | Plot | Plot | Plot | Plot | Plot | Plot | Plot | Plot | Plot |
| 10 SONIC | 5 oz/a | A | 205 | 0 | 90 | 0 | 70 | 95 | 0 | | | | | |
| GENGENIA | 12.8 fl oz/a | B | 301 | 0 | 90 | 0 | 65 | 99 | 20 | | | | | |
| ROUNDUP POWERMAX | 32 fl oz/a | B | 605 | 0 | 90 | 0 | 85 | 95 | 60 | | | | | |
| | | | 704 | 0 | 20 | 0 | 10 | 95 | 0 | | | | | |
| | | | Mean = | 0 | 73 | 0 | 58 | 96 | 20 | | | | | |

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| Pest Type | W Weed | W Weed | W Weed | W Weed |
|-------------------------------|----------------|--------------|--------------|--------------|
| Pest Code | AMAPA | AMAPA | AMAPA | AMAPA |
| Pest Name | Carelessweed | Carelessweed | Carelessweed | Carelessweed |
| Crop Code | | | | |
| Crop Name | | | | |
| Description | FRONT HALF | BACK HALF | FRONT HALF | BACK HALF |
| Part Rated | PLOT P | PLOT P | PLOT P | PLOT P |
| Rating Date | Jul-14-2016 | Jul-14-2016 | Aug-23-2016 | Aug-23-2016 |
| Rating Type | CONTRO | CONTRO | CONTRO | CONTRO |
| Rating Unit | % | % | % | % |
| Number of Subsamples | 1 | 1 | 1 | 1 |
| Days After First/Last Applic. | 56 31 | 56 31 | 96 71 | 96 71 |
| Trt-Eval Interval | 31 DA-B | 31 DA-B | 71 DA-B | 71 DA-B |
| Days After Emergence | 48 DE-1 | 48 DE-1 | 88 DE-1 | 88 DE-1 |
| ARM Action Codes | P | P | P | P |
| Number of Decimals | 0 | 0 | 0 | 0 |
| Trt Treatment | Rate | Appl | | |
| No. Name | Rate Unit | Code Plot | 7 | 8 |
| 1 Untreated Check | | 101 | 0 | 0 |
| | | 402 | 0 | 0 |
| | | 602 | 0 | 0 |
| | | 801 | 0 | 0 |
| | | Mean = | 0 | 0 |
| 2 ENGENIA | 12.8 fl oz/a B | 102 | 60 | 0 |
| ROUNDUP POWERMAX | 32 fl oz/a B | 403 | 80 | 0 |
| | | 601 | 80 | 0 |
| | | 804 | 70 | 0 |
| | | Mean = | 73 | 0 |
| 3 VERDICT | 5 fl oz/a A | 103 | 80 | 15 |
| ENGENIA | 12.8 fl oz/a B | 303 | 98 | 80 |
| ROUNDUP POWERMAX | 32 fl oz/a B | 501 | 95 | 0 |
| | | 703 | 90 | 60 |
| | | Mean = | 91 | 32 |
| 4 OPTILL | 2 oz/a A | 104 | 70 | 5 |
| ENGENIA | 12.8 fl oz/a B | 405 | 90 | 0 |
| ROUNDUP POWERMAX | 32 fl oz/a B | 603 | 95 | 0 |
| | | 805 | 70 | 0 |
| | | Mean = | 81 | 1 |
| 5 VERDICT | 5 fl oz/a A | 105 | 70 | 10 |
| OUTLOOK | 5 fl oz/a A | 304 | 100 | 20 |
| ENGENIA | 12.8 fl oz/a B | 505 | 98 | 55 |
| ROUNDUP POWERMAX | 32 fl oz/a B | 702 | 75 | 15 |
| | | Mean = | 86 | 25 |
| 6 ZIDUA PRO | 4.5 fl oz/a A | 201 | 90 | 20 |
| ENGENIA | 12.8 fl oz/a B | 404 | 90 | 20 |
| ROUNDUP POWERMAX | 32 fl oz/a B | 502 | 98 | 50 |
| | | 803 | 85 | 50 |
| | | Mean = | 91 | 35 |
| 7 ZIDUA PRO | 6 fl oz/a A | 202 | 98 | 55 |
| ENGENIA | 12.8 fl oz/a B | 305 | 100 | 65 |
| ROUNDUP POWERMAX | 32 fl oz/a B | 504 | 95 | 50 |
| | | 701 | 90 | 15 |
| | | Mean = | 96 | 46 |
| 8 ZIDUA SC | 3.25 fl oz/a A | 203 | 95 | 75 |
| ENGENIA | 12.8 fl oz/a B | 401 | 95 | 70 |
| ROUNDUP POWERMAX | 32 fl oz/a B | 604 | 95 | 35 |
| | | 802 | 85 | 55 |
| | | Mean = | 93 | 59 |
| 9 VERDICT | 5 fl oz/a A | 204 | 90 | 60 |
| ZIDUA SC | 3.25 fl oz/a A | 302 | 99 | 60 |
| ENGENIA | 12.8 fl oz/a B | 503 | 100 | 65 |
| ROUNDUP POWERMAX | 32 fl oz/a B | 705 | 90 | 35 |
| | | Mean = | 95 | 55 |

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| Pest Type | W Weed | W Weed | W Weed | W Weed |
|-------------------------------|----------------|--------------|--------------|--------------|
| Pest Code | AMAPA | AMAPA | AMAPA | AMAPA |
| Pest Name | Carelessweed | Carelessweed | Carelessweed | Carelessweed |
| Crop Code | | | | |
| Crop Name | | | | |
| Description | FRONT HALF | BACK HALF | FRONT HALF | BACK HALF |
| Part Rated | PLOT P | PLOT P | PLOT P | PLOT P |
| Rating Date | Jul-14-2016 | Jul-14-2016 | Aug-23-2016 | Aug-23-2016 |
| Rating Type | CONTRO | CONTRO | CONTRO | CONTRO |
| Rating Unit | % | % | % | % |
| Number of Subsamples | 1 | 1 | 1 | 1 |
| Days After First/Last Applic. | 56 31 | 56 31 | 96 71 | 96 71 |
| Trt-Eval Interval | 31 DA-B | 31 DA-B | 71 DA-B | 71 DA-B |
| Days After Emergence | 48 DE-1 | 48 DE-1 | 88 DE-1 | 88 DE-1 |
| ARM Action Codes | P | P | P | P |
| Number of Decimals | 0 | 0 | 0 | 0 |
| Trt Treatment | Rate | Appl | | |
| No. Name | Rate Unit | Code Plot | 7 | 8 |
| 10 SONIC | 5 oz/a A | 205 | 90 | 10 |
| ENGENIA | 12.8 fl oz/a B | 301 | 98 | 20 |
| ROUNDUP POWERMAX | 32 fl oz/a B | 605 | 90 | 45 |
| | | 704 | 90 | 0 |
| | | Mean = | 92 | 19 |
| | | | | 85 |
| | | | | 15 |

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Pest Type
 W, Weed, G-BYRW7, G-WedStg = Weed or volunteer crop
Pest Code
 AMAPA, Amaranthus palmeri, = US
Crop Code
 GLXMA, BSOY, Glycine max, = US
Part Rated
 PLOT = plot
 C = Crop is Part Rated
 P = Pest is Part Rated
Rating Type
 PHYGEN = phytotoxicity - general / injury
 CONTRO = control / burndown or knockdown
Rating Unit
 % = percent
ARM Action Codes
 P = Rating scale of 0 to 100 (e.g. % control or injury)

| Pest Type Pest Code Pest Name | W Weed AMAPA Carelessweed | | W Weed AMAPA Carelessweed | | W Weed AMAPA Carelessweed | | W Weed AMAPA Carelessweed | | |
|--|---|----------------------|---------------------------------|-----------------------|---------------------------------|-----------------------|---------------------------------|-----------------------|-------|
| | GLXMA Soybean | GLXMA Soybean | GLXMA Soybean | GLXMA Soybean | FRONT HALF PLOT P | FRONT HALF PLOT P | BACK HALF PLOT P | BACK HALF PLOT P | |
| Crop Code Crop Name Description Part Rated Rating Date | PLOT C Jun-2-2016 | PLOT P Jun-2-2016 | PLOT C Jun-13-2016 | PLOT P Jun-13-2016 | PLOT P Jun-27-2016 | PLOT P Jun-27-2016 | PLOT P Jun-27-2016 | PLOT P Jun-27-2016 | |
| Rating Type Rating Unit Number of Subsamples | PHYGEN % 1 | CONTRO % 1 | PHYGEN % 1 | CONTRO % 1 | CONTRO % 1 | CONTRO % 1 | CONTRO % 1 | CONTRO % 1 | |
| Days After First/Last Applic. Trt-Eval Interval | 14 14 14 DA-A | 14 14 14 DA-A | 25 25 0 DA-B | 25 25 0 DA-B | 39 14 14 DA-B | 39 14 14 DA-B | 39 14 14 DA-B | 39 14 14 DA-B | |
| Days After Emergence ARM Action Codes Number of Decimals | 6 DE-1 P 0 | 6 DE-1 P 0 | 17 DE-1 P 0 | 17 DE-1 P 0 | 31 DE-1 P 0 | 31 DE-1 P 0 | 31 DE-1 P 0 | 31 DE-1 P 0 | |
| Trt Treatment No. Name | Rate Rate | Appl Unit | Code | 1 | 2 | 3 | 4 | 5 | 6 |
| 1 Untreated Check | | | | 0 - | 0 c | 0 - | 0 b | 0 d | 0 b |
| 2 ENGENIA ROUNDUP POWERMAX | 12.8 fl oz/a B 32 fl oz/a B | | | 0 - | 0 c | 0 - | 0 b | 78 c | 0 b |
| 3 VERDICT ENGENIA ROUNDUP POWERMAX | 5 fl oz/a A 12.8 fl oz/a B 32 fl oz/a B | | | 0 - | 75 a | 1 - | 56 a | 96 ab | 33 ab |
| 4 OPTILL ENGENIA ROUNDUP POWERMAX | 2 oz/a A 12.8 fl oz/a B 32 fl oz/a B | | | 0 - | 35 b | 1 - | 23 b | 88 b | 3 b |
| 5 VERDICT OUTLOOK ENGENIA ROUNDUP POWERMAX | 5 fl oz/a A 5 fl oz/a A 12.8 fl oz/a B 32 fl oz/a B | | | 0 - | 85 a | 0 - | 70 a | 95 ab | 29 ab |
| 6 ZIDUA PRO ENGENIA ROUNDUP POWERMAX | 4.5 fl oz/a A 12.8 fl oz/a B 32 fl oz/a B | | | 0 - | 90 a | 0 - | 88 a | 97 ab | 29 ab |
| 7 ZIDUA PRO ENGENIA ROUNDUP POWERMAX | 6 fl oz/a A 12.8 fl oz/a B 32 fl oz/a B | | | 0 - | 96 a | 0 - | 83 a | 99 a | 60 a |
| 8 ZIDUA SC ENGENIA ROUNDUP POWERMAX | 3.25 fl oz/a A 12.8 fl oz/a B 32 fl oz/a B | | | 0 - | 95 a | 0 - | 86 a | 97 ab | 68 a |
| 9 VERDICT ZIDUA SC ENGENIA ROUNDUP POWERMAX | 5 fl oz/a A 3.25 fl oz/a A 12.8 fl oz/a B 32 fl oz/a B | | | 0 - | 96 a | 0 - | 84 a | 99 a | 71 a |

Purdue Weed Science

Evaluation of PRE Herbicides in Xtend Soybean

Trial ID: 16S-MED-SOY-08 Location: Medaryville Trial Year: 2016
 Protocol ID: 16S-MED-SOY-08 Investigator: Dr. Bill Johnson
 Project ID: MKD H 2016 US D88 Study Director: Joe Ikley
 Sponsor Contact: BASF - Gery Welker

| Pest Type | | W Weed | | W Weed | W Weed | W Weed | | |
|-------------------------------|--------------|--------------|-------------|--------------|--------------|--------------|----------|-------|
| Pest Code | | AMAPA | | AMAPA | AMAPA | AMAPA | | |
| Pest Name | | Carelessweed | | Carelessweed | Carelessweed | Carelessweed | | |
| Crop Code | GLXMA | | GLXMA | | | | | |
| Crop Name | Soybean | | Soybean | | | | | |
| Description | | | | | FRONT HALF | BACK HALF | | |
| Part Rated | PLOT C | PLOT P | PLOT C | PLOT P | PLOT P | PLOT P | | |
| Rating Date | Jun-2-2016 | Jun-2-2016 | Jun-13-2016 | Jun-13-2016 | Jun-27-2016 | Jun-27-2016 | | |
| Rating Type | PHYGEN | CONTRO | PHYGEN | CONTRO | CONTRO | CONTRO | | |
| Rating Unit | % | % | % | % | % | % | | |
| Number of Subsamples | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Days After First/Last Applic. | 14 14 | 14 14 | 25 25 | 25 25 | 39 14 | 39 14 | | |
| Trt-Eval Interval | 14 DA-A | 14 DA-A | 0 DA-B | 0 DA-B | 14 DA-B | 14 DA-B | | |
| Days After Emergence | 6 DE-1 | 6 DE-1 | 17 DE-1 | 17 DE-1 | 31 DE-1 | 31 DE-1 | | |
| ARM Action Codes | P | P | P | P | P | P | | |
| Number of Decimals | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Trt Treatment No. Name | Rate | Appl | | | | | | |
| | Rate Unit | Code | 1 | 2 | 3 | 4 | 5 | 6 |
| 10 SONIC | 5 oz/a | A | 0 - | 73 a | 0 - | 58 a | 96 ab | 20 ab |
| ENGENIA | 12.8 fl oz/a | B | | | | | | |
| ROUNDUP POWERMAX | 32 fl oz/a | B | | | | | | |
| LSD P=.05 | . | | 18.8 | 1.7 | 23.0 | 6.8 | 32.7 | |
| Standard Deviation | 0.0 | | 13.0 | 1.1 | 15.9 | 4.7 | 22.5 | |
| CV | 0.0 | | 20.09 | 455.42 | 29.05 | 5.57 | 74.08 | |
| Bartlett's X2 | 0.0 | | 23.128 | 0.0 | 13.406 | 22.661 | 12.827 | |
| P(Bartlett's X2) | . | | 0.002* | . | 0.063 | 0.004* | 0.076 | |
| Skewness | . | | -0.7906* | 4.2921* | -0.4698 | -2.4568* | 0.473 | |
| Kurtosis | . | | -1.1098 | 17.2853* | -1.4668* | 4.7462* | -1.5244* | |
| Replicate F | 0.000 | | 2.918 | 0.643 | 3.517 | 4.609 | 1.059 | |
| Replicate Prob(F) | 1.0000 | | 0.0522 | 0.5941 | 0.0285 | 0.0099 | 0.3834 | |
| Treatment F | 0.000 | | 35.379 | 0.857 | 19.331 | 166.845 | 5.848 | |
| Treatment Prob(F) | 1.0000 | | 0.0001 | 0.5728 | 0.0001 | 0.0001 | 0.0002 | |

Purdue Weed Science

Evaluation of PRE Herbicides in Xtend Soybean

| | |
|-------------------------------|--|
| Trial ID: 16S-MED-SOY-08 | Location: Medaryville Trial Year: 2016 |
| Protocol ID: 16S-MED-SOY-08 | Investigator: Dr. Bill Johnson |
| Project ID: MKD H 2016 US D88 | Study Director: Joe Ikley |
| | Sponsor Contact: BASF - Gery Welker |

| Pest Type | W Weed | W Weed | W Weed | W Weed |
|-------------------------------|----------------|--------------|--------------|--------------|
| Pest Code | AMAPA | AMAPA | AMAPA | AMAPA |
| Pest Name | Carelessweed | Carelessweed | Carelessweed | Carelessweed |
| Crop Code | | | | |
| Crop Name | | | | |
| Description | FRONT HALF | BACK HALF | FRONT HALF | BACK HALF |
| Part Rated | PLOT P | PLOT P | PLOT P | PLOT P |
| Rating Date | Jul-14-2016 | Jul-14-2016 | Aug-23-2016 | Aug-23-2016 |
| Rating Type | CONTRO | CONTRO | CONTRO | CONTRO |
| Rating Unit | % | % | % | % |
| Number of Subsamples | 1 | 1 | 1 | 1 |
| Days After First/Last Applic. | 56 31 | 56 31 | 96 71 | 96 71 |
| Trt-Eval Interval | 31 DA-B | 31 DA-B | 71 DA-B | 71 DA-B |
| Days After Emergence | 48 DE-1 | 48 DE-1 | 88 DE-1 | 88 DE-1 |
| ARM Action Codes | P | P | P | P |
| Number of Decimals | 0 | 0 | 0 | 0 |
| Trt Treatment | Rate | Appl | | |
| No. Name | Rate Unit | Code | 7 | 8 |
| 1 Untreated Check | | | 0 d | 0 b |
| 2 ENGENIA | 12.8 fl oz/a B | | 73 c | 0 b |
| ROUNDUP POWERMAX | 32 fl oz/a B | | | 35 c |
| 3 VERDICT | 5 fl oz/a A | | 91 ab | 32 ab |
| ENGENIA | 12.8 fl oz/a B | | | 69 abc |
| ROUNDUP POWERMAX | 32 fl oz/a B | | | 7 ab |
| 4 OPTILL | 2 oz/a A | | 81 b | 1 b |
| ENGENIA | 12.8 fl oz/a B | | | 40 bc |
| ROUNDUP POWERMAX | 32 fl oz/a B | | | 0 b |
| 5 VERDICT | 5 fl oz/a A | | 86 ab | 25 ab |
| OUTLOOK | 5 fl oz/a A | | | 56 abc |
| ENGENIA | 12.8 fl oz/a B | | | 8 ab |
| ROUNDUP POWERMAX | 32 fl oz/a B | | | |
| 6 ZIDUA PRO | 4.5 fl oz/a A | | 91 ab | 35 ab |
| ENGENIA | 12.8 fl oz/a B | | | 71 abc |
| ROUNDUP POWERMAX | 32 fl oz/a B | | | 0 b |
| 7 ZIDUA PRO | 6 fl oz/a A | | 96 a | 46 a |
| ENGENIA | 12.8 fl oz/a B | | | 86 ab |
| ROUNDUP POWERMAX | 32 fl oz/a B | | | 14 ab |
| 8 ZIDUA SC | 3.25 fl oz/a A | | 93 ab | 59 a |
| ENGENIA | 12.8 fl oz/a B | | | 70 abc |
| ROUNDUP POWERMAX | 32 fl oz/a B | | | 26 a |
| 9 VERDICT | 5 fl oz/a A | | 95 a | 55 a |
| ZIDUA SC | 3.25 fl oz/a A | | | 91 a |
| ENGENIA | 12.8 fl oz/a B | | | 15 ab |
| ROUNDUP POWERMAX | 32 fl oz/a B | | | |

Purdue Weed Science

Evaluation of PRE Herbicides in Xtend Soybean

Trial ID: 16S-MED-SOY-08 Location: Medaryville Trial Year: 2016
 Protocol ID: 16S-MED-SOY-08 Investigator: Dr. Bill Johnson
 Project ID: MKD H 2016 US D88 Study Director: Joe Ikley
 Sponsor Contact: BASF - Gery Welker

| Pest Type | W Weed | W Weed | W Weed | W Weed |
|-------------------------------|----------------|--------------|--------------|--------------|
| Pest Code | AMAPA | AMAPA | AMAPA | AMAPA |
| Pest Name | Carelessweed | Carelessweed | Carelessweed | Carelessweed |
| Crop Code | | | | |
| Crop Name | | | | |
| Description | FRONT HALF | BACK HALF | FRONT HALF | BACK HALF |
| Part Rated | PLOT P | PLOT P | PLOT P | PLOT P |
| Rating Date | Jul-14-2016 | Jul-14-2016 | Aug-23-2016 | Aug-23-2016 |
| Rating Type | CONTRO | CONTRO | CONTRO | CONTRO |
| Rating Unit | % | % | % | % |
| Number of Subsamples | 1 | 1 | 1 | 1 |
| Days After First/Last Applic. | 56 31 | 56 31 | 96 71 | 96 71 |
| Trt-Eval Interval | 31 DA-B | 31 DA-B | 71 DA-B | 71 DA-B |
| Days After Emergence | 48 DE-1 | 48 DE-1 | 88 DE-1 | 88 DE-1 |
| ARM Action Codes | P | P | P | P |
| Number of Decimals | 0 | 0 | 0 | 0 |
| Trt Treatment | Rate | Rate | Rate | Rate |
| No. Name | Unit Code | Unit Code | Unit Code | Unit Code |
| | 7 | 8 | 9 | 10 |
| 10 SONIC | 5 oz/a A | 19 ab | 85 ab | 15 ab |
| ENGENIA | 12.8 fl oz/a B | | | |
| ROUNDUP POWERMAX | 32 fl oz/a B | | | |
| LSD P=.05 | 8.7 | 26.7 | 30.2 | 14.7 |
| Standard Deviation | 6.0 | 18.3 | 20.8 | 10.1 |
| CV | 7.54 | 69.56 | 34.46 | 122.24 |
| Bartlett's X2 | 10.932 | 13.212 | 15.327 | 1.921 |
| P(Bartlett's X2) | 0.206 | 0.067 | 0.053 | 0.86 |
| Skewness | -2.2178* | 0.4859 | -0.6114 | 1.2859* |
| Kurtosis | 3.972* | -1.3067 | -1.2335 | 0.2923 |
| Replicate F | 10.025 | 1.080 | 9.321 | 3.064 |
| Replicate Prob(F) | 0.0001 | 0.3747 | 0.0002 | 0.0457 |
| Treatment F | 92.433 | 5.858 | 7.408 | 3.145 |
| Treatment Prob(F) | 0.0001 | 0.0002 | 0.0001 | 0.0106 |

Purdue Weed Science

Evaluation of PRE Herbicides in Xtend Soybean

Trial ID: 16S-MED-SOY-08 Location: Medaryville Trial Year: 2016
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Project ID: MKD H 2016 US D88 Study Director: Joe Ikley
Sponsor Contact: BASF - Gery Welker

Pest Type

W, Weed, G-BYRW7, G-WedStg = Weed or volunteer crop

Pest Code

AMAPA, Amaranthus palmeri, = US

Crop Code

GLXMA, BSOY, Glycine max, = US

Part Rated

PLOT = plot

C = Crop is Part Rated

P = Pest is Part Rated

Rating Type

PHYGEN = phytotoxicity - general / injury

CONTRO = control / burndown or knockdown

Rating Unit

% = percent

ARM Action Codes

P = Rating scale of 0 to 100 (e.g. % control or injury)