

## Syngenta Programs for PPO-Resistant Waterhemp.

Project Code: 03-Pierron-M80 Location: Pierron, IL

Investigator: Bryan Young, Assistant Professor, Southern Illinois University

City State Zip Country: Pierron IL USA  
 Trial Status: Final Updated: 9-23-03

**Objective:**

Evaluate various herbicide strategies for control of  
 PPO-resistant waterhemp in soybean.

**Weed Code Common Name Scientific Name**  
 1. AMATA waterhemp, common *Amaranthus rudis* Sauer

**Crop 1:** GLXMA soybean **Variety:** P94B23 RR  
**Planting Method:** Seeded **Planting Date:** 6-22-03  
**Rate:** 75 lb/A **Depth:** 1.0 IN  
**Row Spacing:** 30 IN

**Plot Width, Unit:** 10 FT **Plot Length, Unit:** 26 FT **Reps:** 3  
**Tillage Type:** Reduced-Till **Study Design:** Randomized complete block  
**Previous Crop, Year:** GLXMA, 2002

**Field Prep./Maintenance:** N 0 LB/A, P205 0 LB/A, K20 0 LB/A

**APPLICATION DESCRIPTION**

|                             | A       | B       | C       |
|-----------------------------|---------|---------|---------|
| <b>Application Date:</b>    | 6-10-03 | 7-15-03 | 7-21-03 |
| <b>Time of Day:</b>         | 15:00   | 11:00   | 14:00   |
| <b>Application Method:</b>  | Spray   | Spray   | Spray   |
| <b>Application Timing:</b>  | PRE     | 4-6"W-1 | 4-6"W-2 |
| <b>Applic. Placement:</b>   | BROSOI  | BROFOL  | BROFOL  |
| <b>Air Temp., Unit:</b>     | 78 F    | 86 F    | 88 F    |
| <b>% Relative Humidity:</b> | 88      | 68      | 54      |
| <b>Wind Velocity, Unit:</b> | 5 MPH   | 5 MPH   | 5 MPH   |
| <b>Soil Moisture:</b>       | ABONOR  | NORMAL  | ABONOR  |

**CROP STAGE AT EACH APPLICATION**

|                            | A        | B        | C        |
|----------------------------|----------|----------|----------|
| <b>Crop 1 Code, Stage:</b> | GLXMA NA | GLXMA V3 | GLXMA V6 |
| <b>Height, Unit:</b>       | NA NA    | 6 IN     | 10 IN    |

**WEED STAGE AT EACH APPLICATION**

|                        | A | B      | C      |
|------------------------|---|--------|--------|
| <b>Weed 1 Code:</b>    |   | AMATA  | AMATA  |
| <b>Stage(leaves):</b>  |   | 3-10   | 5-20   |
| <b>Height(inches):</b> |   | 1-6    | 3-8    |
| <b>Density:</b>        |   | Medium | Medium |

**APPLICATION EQUIPMENT**

|                            | A           | B           | C           |
|----------------------------|-------------|-------------|-------------|
| <b>Appl. Equipment:</b>    | CO2 sprayer | CO2 sprayer | CO2 sprayer |
| <b>Operating Pressure:</b> | 40 PSI      | 40 PSI      | 40 PSI      |
| <b>Nozzle Type:</b>        | Flat fan    | Flat fan    | Flat fan    |
| <b>Nozzle Size:</b>        | 8003        | 8002        | 8002        |
| <b>Boom Length, Unit:</b>  | 7.5 FT      | 7.5 FT      | 7.5 FT      |
| <b>Spray Volume, Unit:</b> | 20 GPA      | 20 GPA      | 20 GPA      |

**NOTES:**

Not harvested.

Syngenta Programs for PPO-Resistant Waterhemp.

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| Weed Code         | GLXMA   | GLXMA   | AMATA   | AMATA   | AMATA   | AMATA   |
|-------------------|---------|---------|---------|---------|---------|---------|
| Crop Code         | Injury  | Injury  | Control | Control | Control | Control |
| Rating Data Type  | Percent | Percent | Percent | Percent | Percent | Percent |
| Rating Unit       | 7-21-03 | 8-4-03  | 7-21-03 | 8-4-03  | 8-18-03 | 9-8-03  |
| Rating Date       | 0 DA-C  | 14 DA-C | 0 DA-C  | 14 DA-C | 28 DA-C | 49 DA-C |
| Trt-Eval Interval |         |         |         |         |         |         |

| Trt No. | Treatment Name  | Form Conc | Form Type | Rate  | Rate Unit | Prod Rate | Prod Unit | Grow Stg | Appl Code |    |   |    |    |    |    |
|---------|-----------------|-----------|-----------|-------|-----------|-----------|-----------|----------|-----------|----|---|----|----|----|----|
| 1       | NONTREATED      |           |           |       |           |           |           |          |           | 0  | 0 | 0  | 0  | 0  | 0  |
| 2       | FLEXSTAR        | 1.88      | EC        | 0.294 | LB A/A    | 20        | FL OZ/A   | 4-6"W-1  | B         |    | 2 |    | 17 | 73 | 63 |
| 2       | FUSION          | 2.56      | EC        | 0.2   | LB A/A    | 10        | FL OZ/A   | 4-6"W-1  | B         |    |   |    |    |    |    |
| 2       | DESTINY MSO     | 100       | LIQ       | 1.0   | % V/V     | 1         | % V/V     | 4-6"W-1  | B         |    |   |    |    |    |    |
| 2       | 28% UAN         | 100       | LIQ       | 2.0   | % V/V     | 2         | % V/V     | 4-6"W-1  | B         |    |   |    |    |    |    |
| 3       | FLEXSTAR        | 1.88      | EC        | 0.294 | LB A/A    | 20        | FL OZ/A   | PRE      | A         | 0  | 0 | 0  | 0  | 23 | 20 |
| 4       | FLEXSTAR        | 1.88      | EC        | 0.59  | LB A/A    | 40        | FL OZ/A   | PRE      | A         | 0  | 0 | 0  | 0  | 57 | 65 |
| 5       | BOUNDARY        | 6.5       | EC        | 1.46  | LB A/A    | 28.8      | FL OZ/A   | PRE      | A         | 10 | 3 | 67 | 82 | 94 | 93 |
| 5       | FLEXSTAR        | 1.88      | EC        | 0.294 | LB A/A    | 20        | FL OZ/A   | 4-6"W-2  | C         |    |   |    |    |    |    |
| 5       | DESTINY MSO     | 100       | LIQ       | 1.0   | % V/V     | 1         | % V/V     | 4-6"W-2  | C         |    |   |    |    |    |    |
| 5       | 28% UAN         | 100       | LIQ       | 2.0   | % V/V     | 2         | % V/V     | 4-6"W-2  | C         |    |   |    |    |    |    |
| 6       | DUAL II MAGNUM  | 7.64      | EC        | 1.27  | LB A/A    | 1.33      | PT/A      | PRE      | A         | 13 | 5 | 57 | 77 | 99 | 99 |
| 6       | FLEXSTAR        | 1.88      | EC        | 0.294 | LB A/A    | 20        | FL OZ/A   | 4-6"W-2  | C         |    |   |    |    |    |    |
| 6       | DESTINY MSO     | 100       | LIQ       | 1.0   | % V/V     | 1         | % V/V     | 4-6"W-2  | C         |    |   |    |    |    |    |
| 6       | 28% UAN         | 100       | LIQ       | 2.0   | % V/V     | 2         | % V/V     | 4-6"W-2  | C         |    |   |    |    |    |    |
| 7       | BOUNDARY        | 6.5       | EC        | 1.46  | LB A/A    | 28.8      | FL OZ/A   | PRE      | A         | 0  | 0 | 98 | 99 | 99 | 99 |
| 7       | TOUCHDOWN TOTAL | 4.17      | SC        | 0.75  | LB AE/A   | 23        | FL OZ/A   | 4-6"W-2  | C         |    |   |    |    |    |    |
| 7       | AMS             | 100       | DRY       | 2.5   | LB A/A    | 2.5       | LB/A      | 4-6"W-2  | C         |    |   |    |    |    |    |
| 8       | DUAL II MAGNUM  | 7.64      | EC        | 1.27  | LB A/A    | 1.33      | PT/A      | PRE      | A         | 0  | 0 | 98 | 99 | 99 | 99 |
| 8       | TOUCHDOWN TOTAL | 4.17      | SC        | 0.75  | LB AE/A   | 23        | FL OZ/A   | 4-6"W-2  | C         |    |   |    |    |    |    |
| 8       | AMS             | 100       | DRY       | 2.5   | LB A/A    | 2.5       | LB/A      | 4-6"W-2  | C         |    |   |    |    |    |    |
| 9       | TOUCHDOWN TOTAL | 4.17      | SC        | 0.75  | LB AE/A   | 23        | FL OZ/A   | 4-6"W-1  | B         |    | 0 |    | 99 | 99 | 99 |
| 9       | AMS             | 100       | DRY       | 2.5   | LB A/A    | 2.5       | LB/A      | 4-6"W-1  | B         |    |   |    |    |    |    |
| 9       | TOUCHDOWN TOTAL | 4.17      | SC        | 0.75  | LB AE/A   | 23        | FL OZ/A   | 4-6"W-2  | C         |    |   |    |    |    |    |
| 9       | AMS             | 100       | DRY       | 2.5   | LB A/A    | 2.5       | LB/A      | 4-6"W-2  | C         |    |   |    |    |    |    |
| 10      | ULTRA BLAZER    | 2         | SL        | 0.188 | LB A/A    | 12        | FL OZ/A   | 4-6"W-1  | B         |    | 3 |    | 18 | 30 | 27 |
| 10      | PRIME OIL COC   | 100       | LIQ       | 1.0   | % V/V     | 1         | % V/V     | 4-6"W-1  | B         |    |   |    |    |    |    |
| 10      | AMS             | 100       | DRY       | 2.5   | LB A/A    | 2.5       | LB/A      | 4-6"W-1  | B         |    |   |    |    |    |    |
| 11      | PROWL H2O       | 3.8       | CS        | 1.24  | LB A/A    | 2.6       | PT/A      | PRE      | A         | 10 | 7 | 47 | 40 | 73 | 80 |
| 11      | ULTRA BLAZER    | 2         | SL        | 0.188 | LB A/A    | 12        | FL OZ/A   | 4-6"W-2  | C         |    |   |    |    |    |    |
| 11      | PRIME OIL COC   | 100       | LIQ       | 1.0   | % V/V     | 1         | % V/V     | 4-6"W-2  | C         |    |   |    |    |    |    |
| 11      | AMS             | 100       | DRY       | 2.5   | LB A/A    | 2.5       | LB/A      | 4-6"W-2  | C         |    |   |    |    |    |    |
| 12      | PHOENIX         | 2         | EC        | 0.156 | LB A/A    | 10        | FL OZ/A   | 4-6"W-1  | B         |    | 5 |    | 33 | 57 | 45 |
| 12      | ACTIVATOR 90    | 100       | LIQ       | 0.25  | % V/V     | 0.25      | % V/V     | 4-6"W-1  | B         |    |   |    |    |    |    |

|                   |  |  |  |  |  |  |  |  |         |         |         |         |
|-------------------|--|--|--|--|--|--|--|--|---------|---------|---------|---------|
| Weed Code         |  |  |  |  |  |  |  |  | AMATA   | AMATA   | AMATA   | AMATA   |
| Crop Code         |  |  |  |  |  |  |  |  | GLXMA   | GLXMA   |         |         |
| Rating Data Type  |  |  |  |  |  |  |  |  | Injury  | Injury  | Control | Control |
| Rating Unit       |  |  |  |  |  |  |  |  | Percent | Percent | Percent | Percent |
| Rating Date       |  |  |  |  |  |  |  |  | 7-21-03 | 8-4-03  | 7-21-03 | 8-4-03  |
| Trt-Eval Interval |  |  |  |  |  |  |  |  | 0 DA-C  | 14 DA-C | 0 DA-C  | 14 DA-C |
|                   |  |  |  |  |  |  |  |  |         |         | 28 DA-C | 49 DA-C |

| Trt No.           | Treatment Name  | Form Conc | Form Type | Rate   | Rate Unit | Prod Rate | Prod Unit | Grow Stg | Appl Code |        |        |        |        |        |        |
|-------------------|-----------------|-----------|-----------|--------|-----------|-----------|-----------|----------|-----------|--------|--------|--------|--------|--------|--------|
| 13                | VALOR           | 51        | WG        | 0.078  | LB A/A    | 2.45      | OZ/A      | PRE      | A         | 20     | 12     | 30     | 33     | 58     | 58     |
| 13                | PHOENIX         | 2         | EC        | 0.156  | LB A/A    | 10        | FL OZ/A   | 4-6"W-2  | C         |        |        |        |        |        |        |
| 13                | ACTIVATOR 90    | 100       | LIQ       | 0.25   | % V/V     | 0.25      | % V/V     | 4-6"W-2  | C         |        |        |        |        |        |        |
| 14                | CANOPY XL       | 56.3      | WG        |        |           | 4.5       | OZ/A      | PRE      | A         | 10     | 5      | 96     | 99     | 98     | 96     |
| 14                | ->CLASSIC       | 25        | WG        | 0.0265 | LB A/A    |           |           | PRE      | A         |        |        |        |        |        |        |
| 14                | ->AUTHORITY     | 75        | WG        | 0.1325 | LB A/A    |           |           | PRE      | A         |        |        |        |        |        |        |
| 14                | FUSION          | 2.56      | EC        | 0.2    | LB A/A    | 10        | FL OZ/A   | 4-6"W-2  | C         |        |        |        |        |        |        |
| 14                | FLEXSTAR        | 1.88      | EC        | 0.294  | LB A/A    | 20        | FL OZ/A   | 4-6"W-2  | C         |        |        |        |        |        |        |
| 14                | DESTINY MSO     | 100       | LIQ       | 1.0    | % V/V     | 1         | % V/V     | 4-6"W-2  | C         |        |        |        |        |        |        |
| 14                | 28% UAN         | 100       | LIQ       | 2.0    | % V/V     | 2         | % V/V     | 4-6"W-2  | C         |        |        |        |        |        |        |
| 15                | VALOR           | 51        | WG        | 0.078  | LB A/A    | 2.45      | OZ/A      | PRE      | A         | 0      | 0      | 96     | 99     | 99     | 99     |
| 15                | TOUCHDOWN TOTAL | 4.17      | SC        | 0.75   | LB AE/A   | 23        | FL OZ/A   | 4-6"W-2  | C         |        |        |        |        |        |        |
| 15                | AMS             | 100       | DRY       | 2.5    | LB A/A    | 2.5       | LB/A      | 4-6"W-2  | C         |        |        |        |        |        |        |
| 16                | CANOPY XL       | 56.3      | WG        |        |           | 4.5       | OZ/A      | PRE      | A         | 0      | 0      | 96     | 96     | 85     | 81     |
| 16                | ->CLASSIC       | 25        | WG        | 0.0265 | LB A/A    |           |           | PRE      | A         |        |        |        |        |        |        |
| 16                | ->AUTHORITY     | 75        | WG        | 0.1325 | LB A/A    |           |           | PRE      | A         |        |        |        |        |        |        |
| 17                | VALOR           | 51        | WG        | 0.078  | LB A/A    | 2.45      | OZ/A      | PRE      | A         | 0      | 0      | 73     | 60     | 32     | 27     |
| 18                | BOUNDARY        | 6.5       | EC        | 1.46   | LB A/A    | 28.8      | FL OZ/A   | PRE      | A         | 0      | 0      | 57     | 50     | 50     | 43     |
| 19                | DUAL II MAGNUM  | 7.64      | EC        | 1.27   | LB A/A    | 1.33      | PT/A      | PRE      | A         | 0      | 0      | 77     | 77     | 63     | 57     |
| 20                | TOUCHDOWN TOTAL | 4.17      | SC        | 0.75   | LB AE/A   | 23        | FL OZ/A   | 4-6"W-2  | C         |        |        |        | 99     | 99     | 99     |
| 20                | AMS             | 100       | DRY       | 2.5    | LB A/A    | 2.5       | LB/A      | 4-6"W-2  | C         |        |        |        |        |        |        |
| 21                | CANOPY XL       | 56.3      | WG        |        |           | 4.5       | OZ/A      | PRE      | A         | 0      | 0      | 98     | 99     | 99     | 99     |
| 21                | ->CLASSIC       | 25        | WG        | 0.0265 | LB A/A    |           |           | PRE      | A         |        |        |        |        |        |        |
| 21                | ->AUTHORITY     | 75        | WG        | 0.1325 | LB A/A    |           |           | PRE      | A         |        |        |        |        |        |        |
| 21                | TOUCHDOWN TOTAL | 4.17      | SC        | 0.75   | LB AE/A   | 23        | FL OZ/A   | 4-6"W-2  | C         |        |        |        |        |        |        |
| 21                | AMS             | 100       | DRY       | 2.5    | LB A/A    | 2.5       | LB/A      | 4-6"W-2  | C         |        |        |        |        |        |        |
| LSD (P=.05)       |                 |           |           |        |           |           |           |          |           | 2.4    | 2.3    | 21.3   | 17.5   | 27.8   | 32.7   |
| Replicate F       |                 |           |           |        |           |           |           |          |           | 1.000  | 0.792  | 1.398  | 1.876  | 0.218  | 0.167  |
| Replicate Prob(F) |                 |           |           |        |           |           |           |          |           | 0.3798 | 0.4599 | 0.2627 | 0.1665 | 0.8053 | 0.8471 |
| Treatment F       |                 |           |           |        |           |           |           |          |           | 60.200 | 14.812 | 25.260 | 39.068 | 9.778  | 7.698  |
| Treatment Prob(F) |                 |           |           |        |           |           |           |          |           | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

Syngenta Programs for PPO-Resistant Waterhemp.

Project Code: 03-Pierron-M80 Location: Pierron, IL

#### Trial Comments

1. Protocol: Syngenta.
2. Ratings: CI and WC prior to POST, 14, 28 and 49 DA POST.
3. Weed counts per square meter prior to POST where PRE's were applied and the nontreated.
4. Blanket postemergence application of Fusion 8 oz/A + COC 1% v/v, if needed.
5. DA-C = days after 4-6"W-2 application. 0 DA-C = prior to 4-6"W-2 application.
6. Ratings on 7-21-03 at 0 DA-C were also 41 days after PRE application.
7. Weed counts were not taken.