

A14972A Evaluation on PPO-Resistant Waterhemp - Study 1.

Project Code: 05-Hug Location: Pierron, IL  
 Investigator: Bryan Young

Investigator: Bryan Young, Assistant Professor, Southern Illinois University

City State Zip Country: Pierron IL 62273 USA  
 Trial Status: Final Updated: 12-06-05

**Objective:**  
 Evaluate crop response and control of PPO-resistant waterhemp with A14972A applied postemergence.

**Weed Code Common Name Scientific Name**  
 1. AMATA waterhemp, common *Amaranthus rudis* Sauer  
 2. SETFA foxtail, giant *Setaria faberi* Herrm.

Crop 1: GLXMA soybean  
 Planting Method: Seeded  
 Rate: 75 lb/A Depth: 1.0 IN  
 Row Spacing: 15 IN

Plot Width, Unit: 10 FT Plot Length, Unit: 25 FT Reps: 3  
 Tillage Type: Reduced-Till Study Design: Randomized complete block

**APPLICATION DESCRIPTION**

|                     | A        | B        | C        | D        |
|---------------------|----------|----------|----------|----------|
| Application Date:   | 05-07-05 | 06-06-05 | 06-16-05 | 07-01-05 |
| Time of Day:        | 15:00    | 8:00     | 8:00     | 17:00    |
| Application Method: | Spray    | Spray    | Spray    | Spray    |
| Application Timing: | PRE      | 4-6"W-1  | 4-6"W-2  | 2-4"RG   |
| Applic. Placement:  | BROSOI   | BROFOL   | BROFOL   | BROFOL   |
| Air Temp., Unit:    | 80 F     | 82 F     | 77 F     | 85 F     |

**CROP STAGE AT EACH APPLICATION**

|                     | A        | B        | C        | D        |
|---------------------|----------|----------|----------|----------|
| Crop 1 Code, Stage: | GLXMA NA | GLXMA V3 | GLXMA V5 | GLXMA R1 |
| Height, Unit:       | NA NA    | 5 IN     | 10 IN    | 13 IN    |

**WEED STAGE AT EACH APPLICATION**

|                  | A | B      | C     | D     |
|------------------|---|--------|-------|-------|
| Weed 1 Code:     |   | AMATA  | AMATA | AMATA |
| Stage (leaves):  |   | 5-7    | 6-10  | 4-7   |
| Height (inches): |   | 2-5    | 5-8   | 2-4   |
| Density:         |   | Medium | Low   | Low   |
| Weed 2 Code:     |   | SETFA  | SETFA |       |
| Stage (leaves):  |   | 5-6    | 3-7   |       |
| Height (inches): |   | 4-6    | 4-7   |       |
| Density:         |   | Medium | Low   |       |

**APPLICATION EQUIPMENT**

|                     | A           | B           | C           | D           |
|---------------------|-------------|-------------|-------------|-------------|
| Appl. Equipment:    | CO2 sprayer | CO2 sprayer | CO2 sprayer | CO2 sprayer |
| Operating Pressure: | 40 PSI      | 40 PSI      | 40 PSI      | 40 PSI      |
| Nozzle Type:        | Flat fan    | Flat fan    | Flat fan    | Flat fan    |
| Nozzle Size:        | 8003        | 8002        | 8002        | 8002        |
| Boom Length, Unit:  | 7.5 FT      | 7.5 FT      | 7.5 FT      | 7.5 FT      |
| Spray Volume, Unit: | 15 GPA      | 15 GPA      | 15 GPA      | 15 GPA      |

NOTES:

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| Weed Code         | Crop Code       | Rating Data Type | Rating Unit | Rating Date | Trt-Eval Interval | GLXMA Injury Percent | GLXMA Injury Percent | GLXMA Injury Percent | GLXMA Injury Percent | AMATA Control Percent | AMATA Control Percent | AMATA Control Percent | AMATA Control Percent |         |         |         |        |
|-------------------|-----------------|------------------|-------------|-------------|-------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|---------|---------|---------|--------|
| Trt No.           | Treatment Name  | Form Conc        | Form Type   | Rate        | Unit              | Prod Rate            | Prod Unit            | Grow Stg             | Appl Code            | 06-09-05 28 DAE       | 06-23-05 42 DAE       | 06-09-05 14 DAPO      | 06-23-05 28 DAPO      |         |         |         |        |
| 1                 | NONTREATED      |                  |             |             |                   |                      |                      |                      |                      | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 2                 | A14972A         | 5.3              | EC          | 0.66        | lb ai/a           | 0.5                  | qt/a                 | PRE                  | A                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 3                 | A14972A         | 5.3              | EC          | 0.99        | lb ai/a           | 0.75                 | qt/a                 | PRE                  | A                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 4                 | A14972A         | 5.3              | EC          | 1.33        | lb ai/a           | 1.0                  | qt/a                 | PRE                  | A                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 5                 | A14972A         | 5.3              | EC          | 1.66        | lb ai/a           | 1.25                 | qt/a                 | PRE                  | A                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 6                 | A14972A         | 5.3              | EC          | 1.99        | lb ai/a           | 1.5                  | qt/a                 | PRE                  | A                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 7                 | BOUNDARY        | 6.5              | EC          | 1.22        | lb ai/a           | 1.5                  | pt/a                 | PRE                  | A                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 8                 | BOUNDARY        | 6.5              | EC          | 1.46        | lb ai/a           | 1.8                  | pt/a                 | PRE                  | A                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 9                 | DOMAIN          | 60               | WG          | 0.375       | lb ai/a           | 10                   | oz/a                 | PRE                  | A                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 10                | A14972A         | 5.3              | EC          | 0.66        | lb ai/a           | 0.5                  | qt/a                 | PRE                  | A                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 10                | TOUCHDOWN TOTAL | 4.17             | SC          | 0.78        | lb ae/a           | 24                   | fl oz/a              | 4-6"W-2              | C                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 11                | A14972A         | 5.3              | EC          | 0.99        | lb ai/a           | 0.75                 | qt/a                 | PRE                  | A                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 11                | TOUCHDOWN TOTAL | 4.17             | SC          | 0.78        | lb ae/a           | 24                   | fl oz/a              | 4-6"W-2              | C                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 12                | A14972A         | 5.3              | EC          | 1.33        | lb ai/a           | 1.0                  | qt/a                 | PRE                  | A                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 12                | TOUCHDOWN TOTAL | 4.17             | SC          | 0.78        | lb ae/a           | 24                   | fl oz/a              | 4-6"W-2              | C                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 13                | A14972A         | 5.3              | EC          | 1.66        | lb ai/a           | 1.25                 | qt/a                 | PRE                  | A                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 13                | TOUCHDOWN TOTAL | 4.17             | SC          | 0.78        | lb ae/a           | 24                   | fl oz/a              | 4-6"W-2              | C                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 14                | A14972A         | 5.3              | EC          | 1.99        | lb ai/a           | 1.5                  | qt/a                 | PRE                  | A                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 14                | TOUCHDOWN TOTAL | 4.17             | SC          | 0.78        | lb ae/a           | 24                   | fl oz/a              | 4-6"W-2              | C                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 15                | BOUNDARY        | 6.5              | EC          | 1.22        | lb ai/a           | 1.5                  | pt/a                 | PRE                  | A                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 15                | TOUCHDOWN TOTAL | 4.17             | SC          | 0.78        | lb ae/a           | 24                   | fl oz/a              | 4-6"W-2              | C                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 16                | BOUNDARY        | 6.5              | EC          | 1.46        | lb ai/a           | 1.8                  | pt/a                 | PRE                  | A                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 16                | TOUCHDOWN TOTAL | 4.17             | SC          | 0.78        | lb ae/a           | 24                   | fl oz/a              | 4-6"W-2              | C                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 17                | TOUCHDOWN TOTAL | 4.17             | SC          | 0.78        | lb ae/a           | 24                   | fl oz/a              | 4-6"W-1              | B                    |                       | 0                     | 0                     | 0                     |         |         |         |        |
| 18                | TOUCHDOWN TOTAL | 4.17             | SC          | 0.78        | lb ae/a           | 24                   | fl oz/a              | 4-6"W-1              | B                    |                       | 0                     | 0                     | 0                     |         |         |         |        |
| 18                | TOUCHDOWN TOTAL | 4.17             | SC          | 0.78        | lb ae/a           | 24                   | fl oz/a              | 2-4"RG               | D                    |                       | 0                     | 0                     | 0                     |         |         |         |        |
| 19                | FLEXSTAR        | 1.88             | EC          | 0.352       | lb ai/a           | 24                   | fl oz/a              | 4-6"W-1              | B                    |                       | 13                    | 13                    | 0                     |         |         |         |        |
| 19                | PRIME OIL COC   | 100              | LIQ         | 1.0         | % v/v             | 1                    | % v/v                | 4-6"W-1              | B                    |                       |                       |                       |                       |         |         |         |        |
| 19                | 28% UAN         | 100              | LIQ         | 2.5         | % v/v             | 2.5                  | % v/v                | 4-6"W-1              | B                    |                       |                       |                       |                       |         |         |         |        |
| 20                | RAPTOR          | 1                | AS          | 0.039       | lb ai/a           | 5                    | fl oz/a              | 4-6"W-1              | B                    |                       | 0                     | 0                     | 0                     |         |         |         |        |
| 20                | PRIME OIL COC   | 100              | LIQ         | 1.0         | % v/v             | 1                    | % v/v                | 4-6"W-1              | B                    |                       |                       |                       |                       |         |         |         |        |
| 20                | 28% UAN         | 100              | LIQ         | 2.5         | % v/v             | 2.5                  | % v/v                | 4-6"W-1              | B                    |                       |                       |                       |                       |         |         |         |        |
| 21                | SENCOR          | 75               | WG          | 0.234       | lb ai/a           | 5                    | oz/a                 | PRE                  | A                    | 0                     | 0                     | 0                     | 0                     |         |         |         |        |
| 22                | SEQUENCE        | 5.25             | EW          | 1.97        | lb ai/a           | 3                    | pt/a                 | 4-6"W-1              | B                    |                       | 5                     | 0                     | 0                     |         |         |         |        |
| LSD (P=.05)       |                 |                  |             |             |                   |                      |                      |                      |                      | 0.0                   | 2.1                   | 1.0                   | 0.0                   | 3.5     | 6.6     | 6.6     | 9.3    |
| Replicate F       |                 |                  |             |             |                   |                      |                      |                      |                      | 0.000                 | 0.241                 | 0.952                 | 0.000                 | 0.806   | 0.054   | 0.054   | 0.183  |
| Replicate Prob(F) |                 |                  |             |             |                   |                      |                      |                      |                      | 1.0000                | 0.7866                | 0.3944                | 1.0000                | 0.4555  | 0.9476  | 0.9476  | 0.8333 |
| Treatment F       |                 |                  |             |             |                   |                      |                      |                      |                      | 0.000                 | 17.069                | 60.952                | 0.000                 | 382.935 | 132.393 | 132.393 | 68.231 |
| Treatment Prob(F) |                 |                  |             |             |                   |                      |                      |                      |                      | 1.0000                | 0.0001                | 0.0001                | 1.0000                | 0.0001  | 0.0001  | 0.0001  | 0.0001 |

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|                   |          |         |         |
|-------------------|----------|---------|---------|
| Weed Code         | SETFA    | SETFA   | SETFA   |
| Crop Code         |          |         |         |
| Rating Data Type  | Control  | Control | Control |
| Rating Unit       | Percent  | Percent | Percent |
| Rating Date       | 06-23-05 |         |         |
| Trt-Eval Interval | 42 DAE   | 14 DAPO | 28 DAPO |

| Trt No.           | Treatment Name  | Form Conc | Form Type | Rate  | Rate Unit | Prod Rate | Prod Unit | Grow Stg | Appl Code | Control Percent | Control Percent | Control Percent |
|-------------------|-----------------|-----------|-----------|-------|-----------|-----------|-----------|----------|-----------|-----------------|-----------------|-----------------|
| 1                 | NONTREATED      |           |           |       |           |           |           |          |           | 0               | 0               | 0               |
| 2                 | A14972A         | 5.3       | EC        | 0.66  | lb ai/a   | 0.5       | qt/a      | PRE      | A         | 90              | 90              | 96              |
| 3                 | A14972A         | 5.3       | EC        | 0.99  | lb ai/a   | 0.75      | qt/a      | PRE      | A         | 95              | 95              | 95              |
| 4                 | A14972A         | 5.3       | EC        | 1.33  | lb ai/a   | 1.0       | qt/a      | PRE      | A         | 95              | 95              | 98              |
| 5                 | A14972A         | 5.3       | EC        | 1.66  | lb ai/a   | 1.25      | qt/a      | PRE      | A         | 98              | 98              | 96              |
| 6                 | A14972A         | 5.3       | EC        | 1.99  | lb ai/a   | 1.5       | qt/a      | PRE      | A         | 99              | 99              | 99              |
| 7                 | BOUNDARY        | 6.5       | EC        | 1.22  | lb ai/a   | 1.5       | pt/a      | PRE      | A         | 97              | 97              | 96              |
| 8                 | BOUNDARY        | 6.5       | EC        | 1.46  | lb ai/a   | 1.8       | pt/a      | PRE      | A         | 99              | 99              | 98              |
| 9                 | DOMAIN          | 60        | WG        | 0.375 | lb ai/a   | 10        | oz/a      | PRE      | A         | 88              | 88              | 96              |
| 10                | A14972A         | 5.3       | EC        | 0.66  | lb ai/a   | 0.5       | qt/a      | PRE      | A         | 98              | 99              | 99              |
| 10                | TOUCHDOWN TOTAL | 4.17      | SC        | 0.78  | lb ae/a   | 24        | fl oz/a   | 4-6"W-2  | C         |                 |                 |                 |
| 11                | A14972A         | 5.3       | EC        | 0.99  | lb ai/a   | 0.75      | qt/a      | PRE      | A         | 99              | 99              | 99              |
| 11                | TOUCHDOWN TOTAL | 4.17      | SC        | 0.78  | lb ae/a   | 24        | fl oz/a   | 4-6"W-2  | C         |                 |                 |                 |
| 12                | A14972A         | 5.3       | EC        | 1.33  | lb ai/a   | 1.0       | qt/a      | PRE      | A         | 99              | 99              | 99              |
| 12                | TOUCHDOWN TOTAL | 4.17      | SC        | 0.78  | lb ae/a   | 24        | fl oz/a   | 4-6"W-2  | C         |                 |                 |                 |
| 13                | A14972A         | 5.3       | EC        | 1.66  | lb ai/a   | 1.25      | qt/a      | PRE      | A         | 99              | 99              | 99              |
| 13                | TOUCHDOWN TOTAL | 4.17      | SC        | 0.78  | lb ae/a   | 24        | fl oz/a   | 4-6"W-2  | C         |                 |                 |                 |
| 14                | A14972A         | 5.3       | EC        | 1.99  | lb ai/a   | 1.5       | qt/a      | PRE      | A         | 99              | 99              | 99              |
| 14                | TOUCHDOWN TOTAL | 4.17      | SC        | 0.78  | lb ae/a   | 24        | fl oz/a   | 4-6"W-2  | C         |                 |                 |                 |
| 15                | BOUNDARY        | 6.5       | EC        | 1.22  | lb ai/a   | 1.5       | pt/a      | PRE      | A         | 99              | 99              | 99              |
| 15                | TOUCHDOWN TOTAL | 4.17      | SC        | 0.78  | lb ae/a   | 24        | fl oz/a   | 4-6"W-2  | C         |                 |                 |                 |
| 16                | BOUNDARY        | 6.5       | EC        | 1.46  | lb ai/a   | 1.8       | pt/a      | PRE      | A         | 99              | 99              | 99              |
| 16                | TOUCHDOWN TOTAL | 4.17      | SC        | 0.78  | lb ae/a   | 24        | fl oz/a   | 4-6"W-2  | C         |                 |                 |                 |
| 17                | TOUCHDOWN TOTAL | 4.17      | SC        | 0.78  | lb ae/a   | 24        | fl oz/a   | 4-6"W-1  | B         | 99              | 99              | 99              |
| 18                | TOUCHDOWN TOTAL | 4.17      | SC        | 0.78  | lb ae/a   | 24        | fl oz/a   | 4-6"W-1  | B         | 99              | 99              | 99              |
| 18                | TOUCHDOWN TOTAL | 4.17      | SC        | 0.78  | lb ae/a   | 24        | fl oz/a   | 2-4"RG   | D         |                 |                 |                 |
| 19                | FLEXSTAR        | 1.88      | EC        | 0.352 | lb ai/a   | 24        | fl oz/a   | 4-6"W-1  | B         | 7               | 7               | 17              |
| 19                | PRIME OIL COC   | 100       | LIQ       | 1.0   | % v/v     | 1         | % v/v     | 4-6"W-1  | B         |                 |                 |                 |
| 19                | 28% UAN         | 100       | LIQ       | 2.5   | % v/v     | 2.5       | % v/v     | 4-6"W-1  | B         |                 |                 |                 |
| 20                | RAPTOR          | 1         | AS        | 0.039 | lb ai/a   | 5         | fl oz/a   | 4-6"W-1  | B         | 87              | 87              | 95              |
| 20                | PRIME OIL COC   | 100       | LIQ       | 1.0   | % v/v     | 1         | % v/v     | 4-6"W-1  | B         |                 |                 |                 |
| 20                | 28% UAN         | 100       | LIQ       | 2.5   | % v/v     | 2.5       | % v/v     | 4-6"W-1  | B         |                 |                 |                 |
| 21                | SENCOR          | 75        | WG        | 0.234 | lb ai/a   | 5         | oz/a      | PRE      | A         | 33              | 33              | 77              |
| 22                | SEQUENCE        | 5.25      | EW        | 1.97  | lb ai/a   | 3         | pt/a      | 4-6"W-1  | B         | 99              | 99              | 99              |
| LSD (P=.05)       |                 |           |           |       |           |           |           |          |           | 9.1             | 9.1             | 9.4             |
| Replicate F       |                 |           |           |       |           |           |           |          |           | 0.682           | 0.607           | 0.854           |
| Replicate Prob(F) |                 |           |           |       |           |           |           |          |           | 0.5113          | 0.5495          | 0.4331          |
| Treatment F       |                 |           |           |       |           |           |           |          |           | 87.890          | 88.459          | 65.534          |
| Treatment Prob(F) |                 |           |           |       |           |           |           |          |           | 0.0001          | 0.0001          | 0.0001          |

## Trial Comments

1. Protocol: Syngenta.
2. Ratings: CI 28 DAE; WC 28 and 42 DAE (PRE trts) and 14 and 28 DAT (POST trts).  
Rate PRE trts with the POST trts.
3. Observe handling and mixing characteristics.
4. DAE = Days after emergence. DAPO = Days after postemergence application.  
Ratings at 14 DAPO were on 6-20-05 for PRE or 4-6"W-1 applications and on 6-30-05 for 4-6"W-2 applications.  
Ratings at 28 DAPO were on 7-4-05 for PRE or 4-6"W-1 applications and on 7-14-05 for 4-6"W-2 applications.