

## Postemergence Application Timing in Glyphosate-Resistant Corn.

Project Code: 04-21S-MW60 Location: Belleville Research Center  
Investigator: Bryan Young

Investigator: Bryan Young, Associate Professor, Southern Illinois University

City State Zip Country: Belleville IL 62221 USA  
Trial Status: Final Updated: 10-11-04

## Objective:

To gain a better understanding of the importance of weed control at the proper timing in glyphosate-resistant corn.

| Weed Code | Common Name           | Scientific Name              |
|-----------|-----------------------|------------------------------|
| 1. SETFA  | foxtail, giant        | Setaria faberi Herrm.        |
| 2. XANST  | cocklebur, common     | Xanthium strumarium L.       |
| 3. ABUTH  | velvetleaf            | Abutilon theophrasti Medicus |
| 4. AMBEL  | ragweed, common       | Ambrosia artemisiifolia L.   |
| 5. IPOSS  | morningglory, species | Ipomoea sp.                  |
| 6. AMATA  | waterhemp, common     | Amaranthus rudis Sauer       |

Crop 1: ZEAMX corn, field Variety: DKC 60-17 RR  
Planting Method: Seeded Planting Date: 5-11-04  
Rate: 28000 S/A Depth: 1.5 IN  
Row Spacing: 30 IN

Plot Width, Unit: 10 FT Plot Length, Unit: 30 FT Reps: 4  
Tillage Type: Reduced-Till Study Design: Randomized complete block  
Previous Crop, Year: GLXMA, 2003

Field Prep./Maintenance: N 150 LB/A, P2O5 50 LB/A, K2O 100 LB/A

Soil Name: Ebbert % OM: 2.7 pH: 6.2 CEC: 14  
Texture: Silt loam Fert. Level: P1: 115 LB/A, K: 500 LB/A

## APPLICATION DESCRIPTION

|                      | A       | B       | C      | D       | E      | F       | G       | H       |
|----------------------|---------|---------|--------|---------|--------|---------|---------|---------|
| Application Date:    | 5-13-04 | 6-2-04  | 6-4-04 | 6-7-04  | 6-8-04 | 6-14-04 | 6-17-04 | 6-15-04 |
| Time of Day:         | 8:00    | 8:00    | 11:00  | 10:00   | 10:00  | 9:00    | 10:00   | 9:00    |
| Application Method:  | Spray   | Spray   | Spray  | Spray   | Spray  | Spray   | Spray   | Spray   |
| Application Timing:  | PRE     | 0-4"W-1 | 4-8"W  | 0-4"W-2 | 8-12"W | 12-16"W | 16-20"W | 0-4"RG  |
| Applic. Placement:   | BROSOI  | BROFOL  | BROFOL | BROFOL  | BROFOL | BROFOL  | BROFOL  | BROFOL  |
| Air Temp., Unit:     | 69 F    | 66 F    | 76 F   | 75 F    | 81 F   | 76 F    | 80 F    | 79 F    |
| % Relative Humidity: | 98      | 60      | 44     | 86      | 79     | 98      | 89      | 92      |
| Wind Velocity, Unit: | 5 MPH   | 5 MPH   | 4 MPH  | 8 MPH   | 8 MPH  | 3 MPH   | 3 MPH   | 5 MPH   |
| Soil Moisture:       | NORMAL  | ABONOR  | ABONOR | ABONOR  | NORMAL | ABONOR  | ABONOR  | ABONOR  |

## CROP STAGE AT EACH APPLICATION

|                     | A        | B        | C           | D        | E           | F           | G           | H           |
|---------------------|----------|----------|-------------|----------|-------------|-------------|-------------|-------------|
| Crop 1 Code, Stage: | ZEAMX NA | ZEAMX V4 | ZEAMX V4-V5 | ZEAMX V5 | ZEAMX V5-V6 | ZEAMX V6-V7 | ZEAMX V7-V8 | ZEAMX V6-V7 |
| Height, Unit:       | NA NA    | 8-10 IN  | 8-10 IN     | 10-12 IN | 10-12 IN    | 26-28 IN    | 34-36 IN    | 28-30 IN    |

## WEED STAGE AT EACH APPLICATION

|                 | A     | B      | C      | D      | E     | F      | G     | H     |
|-----------------|-------|--------|--------|--------|-------|--------|-------|-------|
| Weed 1 Code:    | SETFA | SETFA  | SETFA  | SETFA  | SETFA | SETFA  | SETFA | SETFA |
| Stage(leaves):  |       | 3-4    | 4-6    |        | 6-8   | 5-6    | 5-8   |       |
| Height(inches): |       | 1-4    | 3-4    |        | 3-10  | 10-18  | 18-20 |       |
| Density:        |       | Medium | Medium |        | High  | High   | High  |       |
| Weed 2 Code:    | XANST | XANST  | XANST  | XANST  | XANST | XANST  | XANST | XANST |
| Stage(leaves):  |       | 4-6    | 4-6    | 4-6    | 6-8   | 5-8    | 6-8   |       |
| Height(inches): |       | 3-4    | 4-6    | 4-6    | 6-12  | 4-18   | 20-28 |       |
| Density:        |       | Medium | Medium | Medium | High  | Medium | High  |       |
| Weed 3 Code:    | ABUTH | ABUTH  | ABUTH  | ABUTH  | ABUTH | ABUTH  | ABUTH | ABUTH |
| Stage(leaves):  |       | 3-4    | 4-5    |        | 4-6   | 5-8    | 6-8   | 6-8   |
| Height(inches): |       | 1-2    | 2-11   |        | 6-8   | 10-16  | 16-20 | 10-12 |
| Density:        |       | Low    | Low    |        | Low   | Low    | Low   | Low   |
| Weed 4 Code:    | AMBEL | AMBEL  | AMBEL  | AMBEL  | AMBEL | AMBEL  | AMBEL | AMBEL |
| Stage(leaves):  |       | 4-6    | 4-6    |        | 6-8   | 6-8    | 8-10  | 4-6   |
| Height(inches): |       | 2-4    | 2-4    |        | 3-6   | 8-10   | 20-27 | 2-4   |
| Density:        |       | Low    | Low    |        | Low   | Low    | Low   | Low   |

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|                 |       |        |        |       |        |        |        |       |
|-----------------|-------|--------|--------|-------|--------|--------|--------|-------|
| Weed 5 Code:    | IPOSS | IPOSS  | IPOSS  | IPOSS | IPOSS  | IPOSS  | IPOSS  | IPOSS |
| Stage(leaves):  |       | 5-7    | 5-7    |       | 6-12   | 6-12   | 10-12  |       |
| Height(inches): |       | 2-3    | 3-4    |       | 4-6    | 4-8    | 28-30  |       |
| Density:        |       | Low    | Low    |       | Medium | Medium | Medium |       |
| Weed 6 Code:    | AMATA | AMATA  | AMATA  | AMATA | AMATA  | AMATA  | AMATA  | AMATA |
| Stage(leaves):  |       | 2-4    | 4-6    |       | 6-9    | 7-10   |        |       |
| Height(inches): |       | 1-2    | 1-2    |       | 3-8    | 12-16  |        |       |
| Density:        |       | Medium | Medium |       | Medium | Low    |        |       |

## APPLICATION EQUIPMENT

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

## NOTES:

Harvested 9-28-04, (2) 30 inch rows x 27 ft.

Southern Illinois University

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| Weed Code         | Crop Code      | Rating Data Type | Rating Unit | Rating Date | Trt-Eval Interval | ZEAMX Yield bu/A | ZEAMX Injury Percent | ZEAMX Injury Percent | ZEAMX Height Inches | SETFA Control Percent | SETFA Control Percent | XANST Control Percent | XANST Control Percent | ABUTH Control Percent | ABUTH Control Percent | AMBEL Control Percent | AMBEL Control Percent | IPOSS Control Percent | IPOSS Control Percent | AMATA Control Percent |    |    |    |
|-------------------|----------------|------------------|-------------|-------------|-------------------|------------------|----------------------|----------------------|---------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----|----|----|
|                   |                |                  |             |             |                   | 9-28-04          | 3-5 DAT              | 6 DA-D               | 6 DA-G              | -3 DA-D               | 56 DAP                | -3 DA-D               | 56 DAP                | -3 DA-D               | 56 DAP                | -3 DA-D               | 56 DAP                | -3 DA-D               | 56 DAP                | 56 DAP                |    |    |    |
| Trt No.           | Treatment Name | Form Conc        | Form Type   | Rate        | Rate Unit         | Prod Rate        | Prod Unit            | Grow Stg             | Appl Code           |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |    |    |    |
| 1                 | NONTREATED     |                  |             |             |                   | 89               | 0                    | 0                    | 46                  | 0                     | 0                     | 0                     | 0                     | 0                     | 0                     | 0                     | 0                     | 0                     | 0                     | 0                     |    |    |    |
| 2                 | HANDWEED       |                  |             |             |                   | 199              | 0                    | 0                    | 57                  | 99                    | 99                    | 99                    | 99                    | 99                    | 99                    | 99                    | 99                    | 99                    | 99                    | 99                    |    |    |    |
| 3                 | DEGREE XTRA    | 4 L              |             | 1.5         | LB A/A            | 1.5              | QT/A                 | PRE                  | A                   | 203                   | 0                     | 0                     | 56                    | 98                    | 99                    | 76                    | 98                    | 99                    | 97                    | 99                    | 95 | 99 |    |
| 3                 | ROUNDUP W-MAX  | 4.5 SL           |             | 0.77        | LB AE/A           | 22               | FL OZ/A              | 0-4"W-2              | D                   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |    |    |    |
| 4                 | DEGREE XTRA    | 4 L              |             | 3           | LB A/A            | 3                | QT/A                 | PRE                  | A                   | 197                   | 0                     | 0                     | 55                    | 99                    | 99                    | 91                    | 99                    | 99                    | 99                    | 99                    | 96 | 99 |    |
| 4                 | ROUNDUP W-MAX  | 4.5 SL           |             | 0.77        | LB AE/A           | 22               | FL OZ/A              | 0-4"W-2              | D                   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |    |    |    |
| 5                 | DEGREE XTRA    | 4 L              |             | 1.5         | LB A/A            | 1.5              | QT/A                 | 0-4"W-1              | B                   | 190                   | 0                     |                       | 55                    |                       | 99                    |                       |                       | 99                    |                       | 97                    | 99 | 99 |    |
| 5                 | ROUNDUP W-MAX  | 4.5 SL           |             | 0.77        | LB AE/A           | 22               | FL OZ/A              | 0-4"W-1              | B                   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |    |    |    |
| 6                 | DEGREE XTRA    | 4 L              |             | 3           | LB A/A            | 3                | QT/A                 | 0-4"W-1              | B                   | 200                   | 0                     |                       | 57                    |                       | 99                    |                       |                       | 99                    |                       | 98                    | 99 | 99 |    |
| 6                 | ROUNDUP W-MAX  | 4.5 SL           |             | 0.77        | LB AE/A           | 22               | FL OZ/A              | 0-4"W-1              | B                   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |    |    |    |
| 7                 | ROUNDUP W-MAX  | 4.5 SL           |             | 0.77        | LB AE/A           | 22               | FL OZ/A              | 0-4"W-1              | B                   | 208                   | 0                     |                       | 59                    |                       | 99                    |                       |                       | 99                    |                       | 99                    | 97 | 99 |    |
| 7                 | ROUNDUP W-MAX  | 4.5 SL           |             | 0.77        | LB AE/A           | 22               | FL OZ/A              | 0-4"RG               | H                   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |    | 97 |    |
| 8                 | ROUNDUP W-MAX  | 4.5 SL           |             | 0.77        | LB AE/A           | 22               | FL OZ/A              | 0-4"W-1              | B                   | 191                   | 0                     |                       | 55                    |                       | 98                    |                       |                       | 97                    |                       | 96                    | 99 | 91 | 96 |
| 9                 | ROUNDUP W-MAX  | 4.5 SL           |             | 0.77        | LB AE/A           | 22               | FL OZ/A              | 4-8"W                | C                   | 193                   | 0                     |                       | 55                    |                       | 99                    |                       |                       | 98                    |                       | 94                    | 99 | 91 | 97 |
| 10                | ROUNDUP W-MAX  | 4.5 SL           |             | 0.77        | LB AE/A           | 22               | FL OZ/A              | 8-12"W               | E                   | 171                   | 0                     |                       | 51                    |                       | 99                    |                       |                       | 99                    |                       | 77                    | 99 | 76 | 97 |
| 11                | ROUNDUP W-MAX  | 4.5 SL           |             | 0.77        | LB AE/A           | 22               | FL OZ/A              | 12-16"W              | F                   | 159                   | 1                     |                       | 51                    |                       | 99                    |                       |                       | 99                    |                       | 78                    | 99 | 80 | 99 |
| 12                | ROUNDUP W-MAX  | 4.5 SL           |             | 0.77        | LB AE/A           | 22               | FL OZ/A              | 16-20"W              | G                   | 146                   | 1                     |                       | 48                    |                       | 99                    |                       |                       | 99                    |                       | 71                    | 99 | 76 | 99 |
| 13                | ROUNDUP W-MAX  | 4.5 SL           |             | 1.12        | LB AE/A           | 32               | FL OZ/A              | 16-20"W              | G                   | 152                   | 3                     |                       | 48                    |                       | 99                    |                       |                       | 99                    |                       | 76                    | 99 | 79 | 99 |
| LSD (P=.05)       |                |                  |             |             |                   | 27.6             | 1.6                  | 0.0                  | 6.0                 | 1.6                   | 0.4                   | 8.1                   | 0.9                   | 0.0                   | 4.7                   | 0.4                   | 0.3                   | 0.0                   | 3.3                   | 2.3                   |    |    |    |
| Replicate F       |                |                  |             |             |                   | 1.643            | 0.635                | 0.000                | 0.496               | 1.000                 | 0.717                 | 1.759                 | 2.182                 | 0.000                 | 1.908                 | 1.000                 | 0.409                 | 0.000                 | 4.797                 | 3.261                 |    |    |    |
| Replicate Prob(F) |                |                  |             |             |                   | 0.1966           | 0.5972               | 1.0000               | 0.6871              | 0.4363                | 0.5481                | 0.2246                | 0.1071                | 1.0000                | 0.1458                | 0.4363                | 0.7474                | 1.0000                | 0.0065                | 0.0325                |    |    |    |
| Treatment F       |                |                  |             |             |                   | 11.927           | 1.706                | 0.000                | 3.913               | 9736.000              | 30594.652             | 316.134               | 7709.198              | 0.000                 | 272.998               | 156553.000            | 64072.910             | 0.000                 | 527.406               | 165.018               |    |    |    |
| Treatment Prob(F) |                |                  |             |             |                   | 0.0001           | 0.1067               | 1.0000               | 0.0007              | 0.0001                | 0.0001                | 0.0001                | 0.0001                | 1.0000                | 0.0001                | 0.0001                | 0.0001                | 1.0000                | 0.0001                | 0.0001                |    |    |    |

Trial Comments

1. Protocol: Monsanto.
2. Ratings: CI 3-5 DAT; WC prior to POST, at canopy closure and 56 DAP.
3. Corn heights (all plots) at application "G".
4. Yield.
5. DAT = Days after treatment. DA-D = Days after the 0-4"W-2 application. DA-G = Days after the 0-4"RG application. DAP = Days after planting.  
 Ratings at 3-5 DAT were on 5-18-04, 6-5-04, 6-9-04, 6-13-04, 6-19-04, 6-21-04, and 6-20-04 for the PRE, 0-4"W-1, 4-8"W, 8-12"W, 12-16"W, 16-20"W, and 0-4"RG applications, respectively.  
 For treatments #2 and #3, ratings at 3-5 DAT are 5 days after the PRE application, and prior to the postemergence application.  
 For treatments #2 and #3, ratings on 6-4-04, at -3 DA-D, are 22 days after the PRE application, and 3 days prior to the postemergence application.
6. Rating at 56 DAP are also at canopy closure.
7. On 6-4-04 there was not enough AMATA emergence to rate.
8. Harvested 9-28-04, (2) 30 inch rows x 27 ft.