

# Adjuvant Studies, Corn or Soybean

Southern Illinois University

United Suppliers Water Conditioners with Glyphosate.

Trial ID: 13-10B Location: Belleville Res. Center Trial Year: 2013  
Investigator: Bryan Young

**Trial Status:** F one-year/final  
**Initiation Date:** 7-13-13  
**Completion Date:** 8-29-13

**Trial Location**  
**City:** Belleville **Country:** USA  
**State/Prov.:** Illinois IL  
**Postal Code:** 62221

**Objectives:**  
Determine the influence of water conditioners on the efficacy of glyphosate.

**Study Director:** Bryan Young **Title:** Professor  
**Organization:** Southern Illinois University  
**Address:** 1205 Lincoln Drive - AG 176 - MC 4415 **Phone No.:** 618-453-7679  
**City+State/Prov:** Carbondale IL **Mobile No.:** 618-713-6471  
**Postal Code:** 62901 **E-mail:** bgyoung@siu.edu  
**Country:** USA

**Crop Description**  
**Crop 1:** GLXMA Glycine max Soybean  
**Variety:** AG3832 **BBCH Scale:** BSOY  
**Description:** RR2Y  
**Planting Date:** 7-13-13  
**Planting Rate, Unit:** 75 LB/A **Planting Method:** SEEDED  
**Depth, Unit:** 1 IN  
**Row Spacing, Unit:** 30 IN

**Pest Description**  
**Pest 1 Type:** W **Code:** SETFA *Setaria faberi* Herm.  
**Common Name:** foxtail, giant  
**Pest 2 Type:** W **Code:** ABUTH *Abutilon theophrasti* Medik.  
**Common Name:** velvetleaf  
**Pest 3 Type:** W **Code:** AMATA *Amaranthus rudis* Sauer  
**Common Name:** waterhemp, common  
**Pest 4 Type:** W **Code:** IPOHE *Ipomoea hederacea* (L.) Jacq.  
**Common Name:** morningglory, ivyleaf

**Site and Design**  
**Treated Plot Width:** 7.5 FT **Total Plot Width:** 10 FT **Site Type:** FIELD  
**Treated Plot Length:** 30 FT **Total Plot Length:** 30 FT **Experimental Unit:** 1 PLOT  
**Tillage Type:** REDTIL reduced-till  
**Replications:** 3 **Study Design:** RACOB L Randomized Complete Block (RCB)  
**Untreated Arrangement:** INCLUDED single control randomized in each block

| No. | Previous Crop | Year |
|-----|---------------|------|
| 1.  | NON-CROP      | 2012 |

**Maintenance**  

| No. | Maintenance Product Name            |
|-----|-------------------------------------|
| 1.  | N 0 LB/A, P2O5 0 LB/A, K2O 100 LB/A |

**Soil Description**  
**% OM:** 2.8 **Texture:** SIL silt loam  
**pH:** 6.4 **Soil Name:** Pierron  
**CEC:** 9

**Additional Measured Elements**  

| Element | Quantity | Unit |
|---------|----------|------|
| P1      | 80       | lb/A |
| K       | 335      | lb/A |

**Moisture and Weather Conditions**  
**Overall Moisture Conditions:** ABONOR  
**Closest Weather Station:** ICN - Belleville IL **Distance, Unit:** 0.5 MI

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| No. | Date    | Amount | Unit | Type | Type Description | Interval | Unit | Min Temp | Max Temp | Temp Unit |
|-----|---------|--------|------|------|------------------|----------|------|----------|----------|-----------|
| 1.  | 6-30-13 |        |      |      |                  | 7        | DAY  | 61       | 86       | F         |
| 2.  | 7-2-13  | 2.08   | IN   | RAIN | rain             | 2        | DAY  |          |          |           |
| 3.  | 7-7-13  |        |      |      |                  | 7        | DAY  | 62       | 94       | F         |
| 4.  | 7-10-13 | 0.2    | IN   | RAIN | rain             | 1        | DAY  |          |          |           |
| 5.  | 7-14-13 |        |      |      |                  | 7        | DAY  | 64       | 94       | F         |
| 6.  | 7-15-13 | 0.03   | IN   | RAIN | rain             | 1        | DAY  |          |          |           |
| 7.  | 7-20-13 | 0.59   | IN   | RAIN | rain             | 1        | DAY  |          |          |           |
| 8.  | 7-21-13 |        |      |      |                  | 7        | DAY  | 56       | 91       | F         |
| 9.  | 7-26-13 | 0.03   | IN   | RAIN | rain             | 1        | DAY  |          |          |           |
| 10. | 7-28-13 |        |      |      |                  | 7        | DAY  | 52       | 87       | F         |
| 11. | 7-30-13 | 0.46   | IN   | RAIN | rain             | 1        | DAY  |          |          |           |
| 12. | 8-2-13  | 0.24   | IN   | RAIN | rain             | 1        | DAY  |          |          |           |
| 13. | 8-4-13  |        |      |      |                  | 7        | DAY  | 62       | 87       | F         |
| 14. | 8-8-13  | 0.03   | IN   | RAIN | rain             | 3        | DAY  |          |          |           |
| 15. | 8-11-13 |        |      |      |                  | 7        | DAY  | 54       | 85       | F         |
| 16. | 8-12-13 | 0.57   | IN   | RAIN | rain             | 1        | DAY  |          |          |           |
| 17. | 8-18-13 | 0.1    | IN   | RAIN | rain             | 1        | DAY  |          |          |           |
| 18. | 8-18-13 |        |      |      |                  | 7        | DAY  | 61       | 91       | F         |

## Application Description

|                              | A      |
|------------------------------|--------|
| Application Date:            | 8-1-13 |
| Appl. Start Time:            | 8:00   |
| Appl. Stop Time:             | 9:00   |
| Application Method:          | Spray  |
| Application Timing:          | 4-6"W  |
| Application Placement:       | BROFOL |
| Applied By:                  | RJW    |
| Air Temperature, Unit:       | 75 F   |
| % Relative Humidity:         | 82     |
| Wind Velocity, Unit:         | 3 MPH  |
| Wind Direction:              | NW     |
| Dew Presence (Y/N):          | Y      |
| Soil Temperature, Unit:      | 74 F   |
| Soil Moisture:               | NORMAL |
| % Cloud Cover:               | 0      |
| Next Moisture Occurred On:   | 8-2-13 |
| Time to Next Moisture, Unit: | 35 HR  |

## Crop Stage At Each Application

|                          | A     |
|--------------------------|-------|
| Crop 1 Code, BBCH Scale: | GLXMA |
| Stage Scale Used:        | DESC  |
| Stage Majority, Percent: | V2    |
| Stage Minimum, Percent:  | V2    |
| Stage Maximum, Percent:  | V2    |
| Height, Unit:            | 5 IN  |
| Height Minimum, Maximum: | 4 5   |

United Suppliers Water Conditioners with Glyphosate.

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Investigator: Bryan Young**Pest Stage At Each Application**

|                                  | <b>A</b> |
|----------------------------------|----------|
| <b>Pest 1 Code, Type, Scale:</b> | SETFA W  |
| <b>Stage Majority, Percent:</b>  | 4        |
| <b>Stage Minimum, Percent:</b>   | 1        |
| <b>Stage Maximum, Percent:</b>   | 6        |
| <b>Height, Unit:</b>             | 4 IN     |
| <b>Height Minimum, Maximum:</b>  | 1 6      |
| <b>Density, Unit:</b>            | 1 FT2    |
| <b>Pest 2 Code, Type, Scale:</b> | ABUTH W  |
| <b>Stage Majority, Percent:</b>  | 4        |
| <b>Stage Minimum, Percent:</b>   | COTY     |
| <b>Stage Maximum, Percent:</b>   | 6        |
| <b>Height, Unit:</b>             | 3.5 IN   |
| <b>Height Minimum, Maximum:</b>  | 0.5 6    |
| <b>Density, Unit:</b>            | 6 FT2    |
| <b>Pest 3 Code, Type, Scale:</b> | AMATA W  |
| <b>Stage Majority, Percent:</b>  | 6        |
| <b>Stage Minimum, Percent:</b>   | COTY     |
| <b>Stage Maximum, Percent:</b>   | 12       |
| <b>Height, Unit:</b>             | 4 IN     |
| <b>Height Minimum, Maximum:</b>  | 0.5 6    |
| <b>Density, Unit:</b>            | 1 FT2    |
| <b>Pest 4 Code, Type, Scale:</b> | IPOHE W  |
| <b>Stage Majority, Percent:</b>  | 8        |
| <b>Stage Minimum, Percent:</b>   | COTY     |
| <b>Stage Maximum, Percent:</b>   | 20       |
| <b>Height, Unit:</b>             | 4 IN     |
| <b>Height Minimum, Maximum:</b>  | 0.5 8    |
| <b>Density, Unit:</b>            | 1 FT2    |

**Application Equipment**

|                                  | <b>A</b>    |
|----------------------------------|-------------|
| <b>Appl. Equipment:</b>          | CO2 sprayer |
| <b>Equipment Type:</b>           | BACSPR      |
| <b>Operation Pressure, Unit:</b> | 40 PSI      |
| <b>Nozzle Type:</b>              | TTI         |
| <b>Nozzle Size:</b>              | 110015      |
| <b>Boom Length, Unit:</b>        | 7.5 FT      |
| <b>Spray Volume, Unit:</b>       | 10 GPA      |

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| Pest Code          | Crop Code                                               | Rating Date                | Rating Type | Rating Unit                             | Rating Timing                                | Trt-Eval Interval | GLXMA<br>8-15-13<br>Injury<br>Percent | GLXMA<br>8-29-13<br>Injury<br>Percent | SETFA<br>8-15-13<br>Control<br>Percent | SETFA<br>8-29-13<br>Control<br>Percent | ABUTH<br>8-15-13<br>Control<br>Percent | ABUTH<br>8-29-13<br>Control<br>Percent |
|--------------------|---------------------------------------------------------|----------------------------|-------------|-----------------------------------------|----------------------------------------------|-------------------|---------------------------------------|---------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|
|                    |                                                         |                            |             |                                         |                                              |                   | 14 DA-A                               | 28 DA-A                               | 14 DA-A                                | 28 DA-A                                | 14 DA-A                                | 28 DA-A                                |
| Trt No.            | Treatment Name                                          | Form Conc                  | Form Type   | Rate Unit                               | Other Rate                                   | Other Rate Unit   | Growth Stage                          | Appl Code                             |                                        |                                        |                                        |                                        |
| 1                  | DEIONIZED WATER<br>ROUNDUP POWERMAX                     | 4.5 SL                     |             | 0.28 lb ae/a                            | 8 fl oz/a                                    |                   | 4-6"W                                 | A                                     | 0 a                                    | 0 a                                    | 96 ab                                  | 97 ab                                  |
| 2                  | DEIONIZED WATER<br>ROUNDUP POWERMAX<br>NIS              | 4.5 SL<br>100 SL           |             | 0.28 lb ae/a<br>0.25 % v/v              | 8 fl oz/a<br>1 qt/100 gal                    |                   | 4-6"W<br>4-6"W                        | A<br>A                                | 0 a                                    | 0 a                                    | 97 a                                   | 97 ab                                  |
| 3                  | HARD WATER (1000 PPM)<br>ROUNDUP POWERMAX               | 4.5 SL                     |             | 0.28 lb ae/a                            | 8 fl oz/a                                    |                   | 4-6"W                                 | A                                     | 0 a                                    | 0 a                                    | 94 b                                   | 94 bc                                  |
| 4                  | HARD WATER (1000 PPM)<br>ROUNDUP POWERMAX<br>NIS        | 4.5 SL<br>100 SL           |             | 0.28 lb ae/a<br>0.25 % v/v              | 8 fl oz/a<br>1 qt/100 gal                    |                   | 4-6"W<br>4-6"W                        | A<br>A                                | 0 a                                    | 0 a                                    | 97 a                                   | 97 ab                                  |
| 5                  | HARD WATER (1000 PPM)<br>ROUNDUP POWERMAX<br>NIS<br>AMS | 4.5 SL<br>100 SL<br>100 SL |             | 0.28 lb ae/a<br>0.25 % v/v<br>2.5 % v/v | 8 fl oz/a<br>1 qt/100 gal<br>2.5 gal/100 gal |                   | 4-6"W<br>4-6"W<br>4-6"W               | A<br>A<br>A                           | 0 a                                    | 0 a                                    | 97 a                                   | 97 ab                                  |
| 6                  | HARD WATER (1000 PPM)<br>ROUNDUP POWERMAX<br>UAD-1309   | 4.5 SL<br>100 SL           |             | 0.28 lb ae/a<br>2 % v/v                 | 8 fl oz/a<br>2 gal/100 gal                   |                   | 4-6"W<br>4-6"W                        | A<br>A                                | 0 a                                    | 0 a                                    | 96 ab                                  | 96 ab                                  |
| 7                  | HARD WATER (1000 PPM)<br>ROUNDUP POWERMAX<br>UAD-1318   | 4.5 SL<br>100 SL           |             | 0.28 lb ae/a<br>2 % v/v                 | 8 fl oz/a<br>2 gal/100 gal                   |                   | 4-6"W<br>4-6"W                        | A<br>A                                | 0 a                                    | 0 a                                    | 97 a                                   | 98 a                                   |
| 8                  | HARD WATER (1000 PPM)<br>ROUNDUP POWERMAX<br>UAD-1326   | 4.5 SL<br>100 SL           |             | 0.28 lb ae/a<br>0.5 % v/v               | 8 fl oz/a<br>2 qt/100 gal                    |                   | 4-6"W<br>4-6"W                        | A<br>A                                | 0 a                                    | 0 a                                    | 96 ab                                  | 96 ab                                  |
| 9                  | HARD WATER (1000 PPM)<br>ROUNDUP POWERMAX<br>UAD-1349   | 4.5 SL<br>100 SL           |             | 0.28 lb ae/a<br>0.25 % v/v              | 8 fl oz/a<br>1 qt/100 gal                    |                   | 4-6"W<br>4-6"W                        | A<br>A                                | 0 a                                    | 0 a                                    | 91 c                                   | 91 c                                   |
| 10                 | HARD WATER (1000 PPM)<br>ROUNDUP POWERMAX<br>UAD-1350   | 4.5 SL<br>100 SL           |             | 0.28 lb ae/a<br>0.25 % v/v              | 8 fl oz/a<br>1 qt/100 gal                    |                   | 4-6"W<br>4-6"W                        | A<br>A                                | 0 a                                    | 0 a                                    | 96 ab                                  | 96 ab                                  |
| 11                 | HARD WATER (1000 PPM)<br>ROUNDUP POWERMAX<br>UAD-1352   | 4.5 SL<br>100 SL           |             | 0.28 lb ae/a<br>0.5 % v/v               | 8 fl oz/a<br>2 qt/100 gal                    |                   | 4-6"W<br>4-6"W                        | A<br>A                                | 0 a                                    | 0 a                                    | 96 ab                                  | 95 ab                                  |
| 12                 | HARD WATER (1000 PPM)<br>ROUNDUP POWERMAX<br>UAD-1313   | 4.5 SL<br>100 SL           |             | 0.28 lb ae/a<br>0.75 % v/v              | 8 fl oz/a<br>3 qt/100 gal                    |                   | 4-6"W<br>4-6"W                        | A<br>A                                | 0 a                                    | 0 a                                    | 97 a                                   | 96 ab                                  |
| 13                 | HARD WATER (1000 PPM)<br>ROUNDUP POWERMAX<br>UAD-1355   | 4.5 SL<br>100 SL           |             | 0.28 lb ae/a<br>0.5 % v/v               | 8 fl oz/a<br>2 qt/100 gal                    |                   | 4-6"W<br>4-6"W                        | A<br>A                                | 0 a                                    | 0 a                                    | 98 a                                   | 98 a                                   |
| 14                 | NONTREATED                                              |                            |             |                                         |                                              |                   |                                       |                                       | 0 a                                    | 0 a                                    | 0 d                                    | 0 d                                    |
| LSD (P=.05)        |                                                         |                            |             |                                         |                                              |                   |                                       |                                       | 0.0                                    | 0.0                                    | 2.6                                    | 3.0                                    |
| Standard Deviation |                                                         |                            |             |                                         |                                              |                   |                                       |                                       | 0.0                                    | 0.0                                    | 1.6                                    | 1.8                                    |
| CV                 |                                                         |                            |             |                                         |                                              |                   |                                       |                                       | 0.0                                    | 0.0                                    | 1.76                                   | 2.01                                   |
| Replicate F        |                                                         |                            |             |                                         |                                              |                   |                                       |                                       | 0.000                                  | 0.000                                  | 3.729                                  | 3.583                                  |
| Replicate Prob(F)  |                                                         |                            |             |                                         |                                              |                   |                                       |                                       | 1.0000                                 | 1.0000                                 | 0.0377                                 | 0.0422                                 |
| Treatment F        |                                                         |                            |             |                                         |                                              |                   |                                       |                                       | 0.000                                  | 0.000                                  | 801.833                                | 616.552                                |
| Treatment Prob(F)  |                                                         |                            |             |                                         |                                              |                   |                                       |                                       | 1.0000                                 | 1.0000                                 | 0.0001                                 | 0.0001                                 |

Means followed by same letter do not significantly differ (P=.05, LSD)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

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|                                                    |           |           |              |                 |                 |              |           |         |         |
|----------------------------------------------------|-----------|-----------|--------------|-----------------|-----------------|--------------|-----------|---------|---------|
| Pest Code                                          |           |           |              |                 |                 | AMATA        | AMATA     | IPOHE   | IPOHE   |
| Crop Code                                          |           |           |              |                 |                 | 8-15-13      | 8-29-13   | 8-15-13 | 8-29-13 |
| Rating Date                                        |           |           |              |                 |                 | Control      | Control   | Control | Control |
| Rating Type                                        |           |           |              |                 |                 | Percent      | Percent   | Percent | Percent |
| Rating Unit                                        |           |           |              |                 |                 |              |           |         |         |
| Rating Timing                                      |           |           |              |                 |                 |              |           |         |         |
| Trt-Eval Interval                                  |           |           |              |                 |                 | 14 DA-A      | 28 DA-A   | 14 DA-A | 28 DA-A |
| Trt Treatment No. Name                             | Form Conc | Form Type | Rate Unit    | Other Rate      | Other Rate Unit | Growth Stage | Appl Code |         |         |
| 1 DEIONIZED WATER ROUNDUP POWERMAX                 | 4.5 SL    |           | 0.28 lb ae/a | 8 fl oz/a       |                 | 4-6"W A      |           | 60 de   | 63 ef   |
|                                                    |           |           |              |                 |                 |              |           | 54 c    | 55 c    |
| 2 DEIONIZED WATER ROUNDUP POWERMAX NIS             | 4.5 SL    |           | 0.28 lb ae/a | 8 fl oz/a       |                 | 4-6"W A      |           | 69 cd   | 70 c-f  |
|                                                    | 100 SL    |           | 0.25 % v/v   | 1 qt/100 gal    |                 | 4-6"W A      |           | 68 b    | 68 ab   |
| 3 HARD WATER (1000 PPM) ROUNDUP POWERMAX           | 4.5 SL    |           | 0.28 lb ae/a | 8 fl oz/a       |                 | 4-6"W A      |           | 55 e    | 50 g    |
|                                                    |           |           |              |                 |                 |              |           | 55 c    | 55 c    |
| 4 HARD WATER (1000 PPM) ROUNDUP POWERMAX NIS       | 4.5 SL    |           | 0.28 lb ae/a | 8 fl oz/a       |                 | 4-6"W A      |           | 60 de   | 62 f    |
|                                                    | 100 SL    |           | 0.25 % v/v   | 1 qt/100 gal    |                 | 4-6"W A      |           | 68 b    | 69 ab   |
| 5 HARD WATER (1000 PPM) ROUNDUP POWERMAX NIS AMS   | 4.5 SL    |           | 0.28 lb ae/a | 8 fl oz/a       |                 | 4-6"W A      |           | 80 b    | 80 bc   |
|                                                    | 100 SL    |           | 0.25 % v/v   | 1 qt/100 gal    |                 | 4-6"W A      |           | 68 b    | 71 ab   |
|                                                    | 100 SL    |           | 2.5 % v/v    | 2.5 gal/100 gal |                 | 4-6"W A      |           |         |         |
| 6 HARD WATER (1000 PPM) ROUNDUP POWERMAX UAD-1309  | 4.5 SL    |           | 0.28 lb ae/a | 8 fl oz/a       |                 | 4-6"W A      |           | 78 bc   | 74 b-e  |
|                                                    | 100 SL    |           | 2 % v/v      | 2 gal/100 gal   |                 | 4-6"W A      |           | 68 b    | 70 ab   |
| 7 HARD WATER (1000 PPM) ROUNDUP POWERMAX UAD-1318  | 4.5 SL    |           | 0.28 lb ae/a | 8 fl oz/a       |                 | 4-6"W A      |           | 92 a    | 92 a    |
|                                                    | 100 SL    |           | 2 % v/v      | 2 gal/100 gal   |                 | 4-6"W A      |           | 82 a    | 80 a    |
| 8 HARD WATER (1000 PPM) ROUNDUP POWERMAX UAD-1326  | 4.5 SL    |           | 0.28 lb ae/a | 8 fl oz/a       |                 | 4-6"W A      |           | 60 de   | 50 g    |
|                                                    | 100 SL    |           | 0.5 % v/v    | 2 qt/100 gal    |                 | 4-6"W A      |           | 64 bc   | 68 b    |
| 9 HARD WATER (1000 PPM) ROUNDUP POWERMAX UAD-1349  | 4.5 SL    |           | 0.28 lb ae/a | 8 fl oz/a       |                 | 4-6"W A      |           | 62 de   | 50 g    |
|                                                    | 100 SL    |           | 0.25 % v/v   | 1 qt/100 gal    |                 | 4-6"W A      |           | 62 bc   | 60 bc   |
| 10 HARD WATER (1000 PPM) ROUNDUP POWERMAX UAD-1350 | 4.5 SL    |           | 0.28 lb ae/a | 8 fl oz/a       |                 | 4-6"W A      |           | 67 d    | 60 fg   |
|                                                    | 100 SL    |           | 0.25 % v/v   | 1 qt/100 gal    |                 | 4-6"W A      |           | 63 bc   | 65 bc   |
| 11 HARD WATER (1000 PPM) ROUNDUP POWERMAX UAD-1352 | 4.5 SL    |           | 0.28 lb ae/a | 8 fl oz/a       |                 | 4-6"W A      |           | 67 d    | 67 def  |
|                                                    | 100 SL    |           | 0.5 % v/v    | 2 qt/100 gal    |                 | 4-6"W A      |           | 68 b    | 62 bc   |
| 12 HARD WATER (1000 PPM) ROUNDUP POWERMAX UAD-1313 | 4.5 SL    |           | 0.28 lb ae/a | 8 fl oz/a       |                 | 4-6"W A      |           | 78 bc   | 77 bcd  |
|                                                    | 100 SL    |           | 0.75 % v/v   | 3 qt/100 gal    |                 | 4-6"W A      |           | 62 bc   | 60 bc   |
| 13 HARD WATER (1000 PPM) ROUNDUP POWERMAX UAD-1355 | 4.5 SL    |           | 0.28 lb ae/a | 8 fl oz/a       |                 | 4-6"W A      |           | 78 bc   | 82 ab   |
|                                                    | 100 SL    |           | 0.5 % v/v    | 2 qt/100 gal    |                 | 4-6"W A      |           | 70 b    | 72 ab   |
| 14 NONTREATED                                      |           |           |              |                 |                 |              |           | 0 f     | 0 h     |
|                                                    |           |           |              |                 |                 |              |           | 0 d     | 0 d     |
| LSD (P=.05)                                        |           |           |              |                 |                 |              |           | 9.6     | 10.9    |
| Standard Deviation                                 |           |           |              |                 |                 |              |           | 5.7     | 6.5     |
| CV                                                 |           |           |              |                 |                 |              |           | 8.85    | 10.36   |
|                                                    |           |           |              |                 |                 |              |           | 11.35   | 11.56   |
| Replicate F                                        |           |           |              |                 |                 |              |           | 2.418   | 0.700   |
| Replicate Prob(F)                                  |           |           |              |                 |                 |              |           | 0.1089  | 0.5056  |
| Treatment F                                        |           |           |              |                 |                 |              |           | 41.545  | 34.811  |
| Treatment Prob(F)                                  |           |           |              |                 |                 |              |           | 0.0001  | 0.0001  |

United Suppliers Water Conditioners with Glyphosate.

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Trial Comments

1. Protocol: United Suppliers (AD 13002).
2. Ratings: CI/WC at 14 and 28 DA-A.
3. Mixing instructions, Use hardwater for most treatments, deionized water for the rest.  
HARD WATER (1000 PPM) = Ca + Mg hard water.  
HARD WATER MIXING INSTRUCTIONS:  
To make 3 gallons of 1000 ppm Ca + Mg hard water use the formula:  
13.45 g of  $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$  (Calcium Chloride Dihydrate)  
4.62 g of  $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$  (Magnesium Chloride Hexahydrate)  
3 gallons distilled water  
Be sure to use the dihydrate form of the calcium chloride and the hexahydrate form of the magnesium chloride.  
Be sure to stir in the salts to insure that the solutions are all homogeneous before use.
4. Spraying instructions, must use TTI110015 tips and 40 PSI.
5. No yield.