

Weed Management in Strip-Tillage Corn.

01-11A-E135

OBJECTIVE: Determine the effect of tillage on weed control.

SUMMARY: Harness Xtra controlled 79 to 85% of giant foxtail and common waterhemp in no-till and strip-till, whereas control of these two weeds in conventional tillage was 95 to 98%. Similarly, greater yellow nutsedge control was observed from Harness Xtra in conventional tillage compared to strip-till or no-till. In contrast, giant foxtail, common waterhemp, and yellow nutsedge control was similar with Roundup Ultra regardless of tillage system.

Nontreated and handweeded conventional tillage plots yielded significantly higher than similarly treated no-till or strip-till plots. However, corn yield was similar in Harness Xtra treated plots regardless of tillage system. In plots treated with Roundup Ultra, corn yield was significantly higher with conventional tillage compared to strip-till.

HERBICIDES / TILLAGES

BICEP II MAGNUM 5.5 L
 HARNESS XTRA 5.6 L
 ROUNDUP ULTRA 3 SL
 CONV-TILL
 NO-TILL
 STRIP-TILL

WEEDS

cocklebur, common
 foxtail, giant
 morningglory, ivyleaf
 nutsedge, yellow
 ragweed, common
 ragweed, giant
 velvetleaf
 waterhemp, common

CROP

corn, field

Bryan Young

PLANT, SOIL AND GENERAL AGRICULTURE DEPARTMENT

SOUTHERN ILLINOIS UNIVERSITY

Weed Management in Strip-Tillage Corn.

Project Code: 01-11A-E135 Location: BELLEVILLE RESEARCH CENTER

Investigator: Bryan Young, Assistant Professor, Southern Illinois University

City State Zip Country: Belleville IL 62221 USA
Trial Status: Final Initiation Date: 11-16-00

| Weed Code | Common Name | Scientific Name |
|-----------|-----------------------|------------------------------|
| 1. SETFA | foxtail, giant | Setaria faberi Herrm. |
| 2. CYPES | nutsedge, yellow | Cyperus esculentus L. |
| 3. IPOHE | morningglory, ivyleaf | Ipomoea hederacea (L.) Jacq. |
| 4. AMBEL | ragweed, common | Ambrosia artemisiifolia L. |
| 5. XANST | cocklebur, common | Xanthium strumarium L. |
| 6. AMATA | waterhemp, common | Amaranthus rudis Sauer |
| 7. ABUTH | velvetleaf | Abutilon theophrasti Medicus |
| 8. AMBTR | ragweed, giant | Ambrosia trifida L. |

| | | | |
|------------------|-------------------|----------------|-----------|
| Crop 1: | ZEAMX corn, field | Variety: | DK 626 RR |
| Planting Method: | Seeded | Planting Date: | 5-11-01 |
| Rate: | 28000 S/A | Depth: | 1.5 IN |
| Row Spacing: | 30 IN | | |

| | | | | | |
|--------------------------|---------------------------------------|--------------------|------------|-------|---|
| Plot Width, Unit: | 10 FT | Plot Length, Unit: | 26 FT | Reps: | 6 |
| Tillage Type: | See note | Study Design: | Split-plot | | |
| Previous Crop, Year: | GLXMA, 2000 | | | | |
| Field Prep./Maintenance: | N 150 LB/A, P205 0 LB/A, K20 150 LB/A | | | | |

| | | | | | | | |
|------------|-----------|--------------|--------------------------|-----|-----|------|----|
| Soil Name: | Weir | % OM: | 1.5 | pH: | 6.0 | CEC: | 12 |
| Texture: | Silt loam | Fert. Level: | P1: 81 LB/A, K: 247 LB/A | | | | |

APPLICATION DESCRIPTION

| | A | B | C |
|----------------------|---------|---------|---------|
| Application Date: | 5-11-01 | 6-11-01 | 6-13-01 |
| Time of Day: | 17:00 | 20:00 | 19:30 |
| Application Method: | Spray | Spray | Spray |
| Application Timing: | PRE | 4-6"W-1 | 4-6"W-2 |
| Applic. Placement: | BROS0I | BROFOL | BROFOL |
| Air Temp., Unit: | 82 F | 76 F | 90 F |
| % Relative Humidity: | 44 | 80 | 46 |
| Wind Velocity, Unit: | 5 MPH | 0 MPH | 5-7 MPH |
| Soil Moisture: | NORMAL | NORMAL | NORMAL |

CROP STAGE AT EACH APPLICATION

| | A | B | C |
|---------------------|----------|----------|----------|
| Crop 1 Code, Stage: | ZEAMX NA | ZEAMX V6 | ZEAMX V6 |
| Height, Unit: | NA NA | 14-16 IN | 16 IN |

WEED STAGE AT EACH APPLICATION

| | A | B | C |
|-----------------|-------|-------|--------|
| Weed 1 Code: | SETFA | SETFA | SETFA |
| Stage(leaves): | | 4-6 | 4-8 |
| Height(inches): | | 2-6 | 2-8 |
| Density: | | High | High |
| Weed 2 Code: | CYPES | CYPES | CYPES |
| Stage(leaves): | | 4-6 | 4-6 |
| Height(inches): | | 2-4 | 4-6 |
| Density: | | Low | Medium |
| Weed 3 Code: | IPOHE | IPOHE | IPOHE |
| Stage(leaves): | | 3-5 | |
| Height(inches): | | 2-4 | |
| Density: | | Low | |

| | | | |
|------------------------|-------|--------|--------|
| Weed 4 Code: | AMBEL | AMBEL | AMBEL |
| Stage(leaves): | | 2-8 | 4-8 |
| Height(inches): | | 2-6 | 2-8 |
| Density: | | High | Medium |
| Weed 5 Code: | XANST | XANST | XANST |
| Stage(leaves): | | 4-8 | 5-8 |
| Height(inches): | | 4-6 | 4-8 |
| Density: | | High | Medium |
| Weed 6 Code: | AMATA | AMATA | AMATA |
| Stage(leaves): | | 2-10 | 4-10+ |
| Height(inches): | | 1-6 | 2-10 |
| Density: | | High | High |
| Weed 7 Code: | ABUTH | ABUTH | ABUTH |
| Stage(leaves): | | 3-5 | 4-6 |
| Height(inches): | | 2-4 | 4-6 |
| Density: | | Medium | Low |
| Weed 8 Code: | AMBTR | AMBTR | AMBTR |
| Stage(leaves): | | 4-6 | 4-8 |
| Height(inches): | | 3-6 | 4-8 |
| Density: | | Medium | Low |

APPLICATION EQUIPMENT

| | A | B | C |
|----------------------------|-------------|-------------|-------------|
| Appl. Equipment: | CO2 sprayer | CO2 sprayer | CO2 sprayer |
| Operating Pressure: | 40 PSI | 40 PSI | 40 PSI |
| Nozzle Type: | Flat fan | Flat fan | Flat fan |
| Nozzle Size: | 8004 | 8004 | 8004 |
| Boom Length, Unit: | 7.5 FT | 7.5 FT | 7.5 FT |
| Spray Volume, Unit: | 27.92 GPA | 27.92 GPA | 27.92 GPA |

NOTES: HARVESTED 10-2-01, 2 ROWS X 23 FT.

Tillages are no-till, strip-till, and conventional-till, see treatment list.

Weed Management in Strip-Tillage Corn.

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| Weed Code | | Crop Code | | Rating Data Type | | Rating Unit | | Rating Date | | Trt-Eval Interval | | ZEAMX | SETFA | SETFA | SETFA | CYPES | CYPES | CYPES | IPOHE | IPOHE | IPOHE | AMBEL | AMBEL | AMBEL |
|-------------------|--------------------------|-----------|-----------|------------------|---------|-------------|------------|-------------|-----------|-------------------|----------|----------|----------|---------|---------|---------|---------|---------|---------|----------|----------|----------|---------|---------|
| | | | | | | | | | | | | Yield | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control |
| | | | | | | | | | | | | bu/A | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent |
| | | | | | | | | | | | | 10-2-01 | 14 DAT | 28 DAT | 56 DAT | 14 DAT | 28 DAT | 56 DAT | 14 DAT | 28 DAT | 56 DAT | 14 DAT | 28 DAT | 56 DAT |
| Trt No. | Treatment Name | Form Conc | Form Type | Rate | Unit | Prod Rate | Prod Unit | Grow Stg | Appl Code | | | | | | | | | | | | | | | |
| 1 | NO-TILL | | | | | | | | | 112 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | NO HERBS AFTER BURN DOWN | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | STRIP-TILL | | | | | | | | | 117 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | NO HERBS AFTER BURN DOWN | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | CONV-TILL | | | | | | | | | 144 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | NO HERBS AFTER BURN DOWN | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | NO-TILL | | | | | | | | | 141 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 |
| 4 | BICEP II MAGNUM | 5.5 | L | 2.89 | LB A/A | 4.2 | PT/A | PRE | A | | | | | | | | | | | | | | | |
| 4 | HANDWEED | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | STRIP-TILL | | | | | | | | | 153 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 |
| 5 | BICEP II MAGNUM | 5.5 | L | 2.89 | LB A/A | 4.2 | PT/A | PRE | A | | | | | | | | | | | | | | | |
| 5 | HANDWEED | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | CONV-TILL | | | | | | | | | 161 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 |
| 6 | BICEP II MAGNUM | 5.5 | L | 2.89 | LB A/A | 4.2 | PT/A | PRE | A | | | | | | | | | | | | | | | |
| 6 | HANDWEED | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | NO-TILL | | | | | | | | | 145 | 95 | 82 | 79 | 93 | 77 | 76 | 98 | 98 | 95 | 98 | 97 | 96 | 96 | 96 |
| 7 | HARNESS XTRA | 5.6 | L | 3.36 | LB A/A | 4.8 | PT/A | PRE | A | | | | | | | | | | | | | | | |
| 8 | STRIP-TILL | | | | | | | | | 153 | 96 | 83 | 83 | 90 | 83 | 76 | 97 | 99 | 96 | 96 | 94 | 94 | 94 | 94 |
| 8 | HARNESS XTRA | 5.6 | L | 3.36 | LB A/A | 4.8 | PT/A | PRE | A | | | | | | | | | | | | | | | |
| 9 | CONV-TILL | | | | | | | | | 157 | 97 | 97 | 95 | 97 | 93 | 93 | 96 | 98 | 97 | 98 | 98 | 97 | 97 | 97 |
| 9 | HARNESS XTRA | 5.6 | L | 3.36 | LB A/A | 4.8 | PT/A | PRE | A | | | | | | | | | | | | | | | |
| 10 | NO-TILL | | | | | | | | | 153 | 97 | 94 | 93 | 88 | 85 | 88 | 93 | 93 | 92 | 97 | 97 | 97 | 97 | 98 |
| 10 | ROUNDUP ULTRA | 3 | SL | 0.75 | LB AE/A | 2.0 | PT/A | 4-6"W-2 | C | | | | | | | | | | | | | | | |
| 10 | AMS | 100 | DRY | 2.0 | % W/W | 17 | LB/100 GAL | 4-6"W-2 | C | | | | | | | | | | | | | | | |
| 11 | STRIP-TILL | | | | | | | | | 151 | 99 | 95 | 95 | 88 | 87 | 89 | 92 | 92 | 92 | 98 | 98 | 98 | 98 | 98 |
| 11 | ROUNDUP ULTRA | 3 | SL | 0.75 | LB AE/A | 2.0 | PT/A | 4-6"W-2 | C | | | | | | | | | | | | | | | |
| 11 | AMS | 100 | DRY | 2.0 | % W/W | 17 | LB/100 GAL | 4-6"W-2 | C | | | | | | | | | | | | | | | |
| 12 | CONV-TILL | | | | | | | | | 167 | 97 | 94 | 95 | 79 | 86 | 88 | 83 | 89 | 89 | 98 | 97 | 97 | 97 | 97 |
| 12 | ROUNDUP ULTRA | 3 | SL | 0.75 | LB AE/A | 2.0 | PT/A | 4-6"W-1 | B | | | | | | | | | | | | | | | |
| 12 | AMS | 100 | DRY | 2.0 | % W/W | 17 | LB/100 GAL | 4-6"W-1 | B | | | | | | | | | | | | | | | |
| LSD (P=.05) | | | | | | | | | | 15.3 | 1.3 | 3.5 | 3.6 | 6.0 | 6.8 | 5.6 | 6.3 | 4.2 | 4.6 | 2.2 | 2.9 | 3.6 | | |
| Replicate F | | | | | | | | | | 2.412 | 0.186 | 1.388 | 0.175 | 1.750 | 1.033 | 2.057 | 0.478 | 1.009 | 1.140 | 1.712 | 2.969 | 3.068 | | |
| Replicate Prob(F) | | | | | | | | | | 0.0477 | 0.9669 | 0.2431 | 0.9709 | 0.1387 | 0.4075 | 0.0848 | 0.7911 | 0.4214 | 0.3505 | 0.1471 | 0.0192 | 0.0163 | | |
| Treatment F | | | | | | | | | | 9.043 | 9627.286 | 1212.739 | 1109.073 | 392.351 | 296.440 | 440.852 | 377.964 | 865.053 | 692.806 | 3283.428 | 1891.843 | 1216.989 | | |
| Treatment Prob(F) | | | | | | | | | | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | | |

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| Weed Code | | | | | | | | XANST | XANST | XANST | AMATA | AMATA | AMATA | ABUTH | ABUTH | ABUTH | AMBTR | AMBTR | AMBTR | | |
|-------------------|--------------------------|-----------|-----------|--------------|------|---------------|-----------|-----------|-----------|----------|----------|----------|----------|----------|---------|----------|----------|----------|----------|----------|---------|
| Rating Data Type | | | | | | | | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | Control | | |
| Rating Unit | | | | | | | | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent | | |
| Trt-Eval Interval | | | | | | | | 14 DAT | 28 DAT | 56 DAT | 14 DAT | 28 DAT | 56 DAT | 14 DAT | 28 DAT | 56 DAT | 14 DAT | 28 DAT | 56 DAT | | |
| Trt No. | Treatment Name | Form Conc | Form Type | Rate | Unit | Prod Rate | Prod Unit | Grow Stg | Appl Code | | | | | | | | | | | | |
| 1 | NO-TILL | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 1 | NO HERBS AFTER BURN DOWN | | | | | | | | | | | | | | | | | | | | |
| 2 | STRIP-TILL | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 2 | NO HERBS AFTER BURN DOWN | | | | | | | | | | | | | | | | | | | | |
| 3 | CONV-TILL | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 3 | NO HERBS AFTER BURN DOWN | | | | | | | | | | | | | | | | | | | | |
| 4 | NO-TILL | | | | | | | | | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | | |
| 4 | BICEP II MAGNUM | 5.5 L | | 2.89 LB A/A | | 4.2 PT/A | | PRE | A | | | | | | | | | | | | |
| 4 | HANDWEED | | | | | | | | | | | | | | | | | | | | |
| 5 | STRIP-TILL | | | | | | | | | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | | |
| 5 | BICEP II MAGNUM | 5.5 L | | 2.89 LB A/A | | 4.2 PT/A | | PRE | A | | | | | | | | | | | | |
| 5 | HANDWEED | | | | | | | | | | | | | | | | | | | | |
| 6 | CONV-TILL | | | | | | | | | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | | |
| 6 | BICEP II MAGNUM | 5.5 L | | 2.89 LB A/A | | 4.2 PT/A | | PRE | A | | | | | | | | | | | | |
| 6 | HANDWEED | | | | | | | | | | | | | | | | | | | | |
| 7 | NO-TILL | | | | | | | | | 92 | 90 | 91 | 98 | 86 | 85 | 95 | 97 | 94 | 97 | | |
| 7 | HARNES XTRA | 5.6 L | | 3.36 LB A/A | | 4.8 PT/A | | PRE | A | | | | | | | | | | | | |
| 8 | STRIP-TILL | | | | | | | | | 93 | 90 | 90 | 97 | 89 | 81 | 95 | 97 | 94 | 97 | | |
| 8 | HARNES XTRA | 5.6 L | | 3.36 LB A/A | | 4.8 PT/A | | PRE | A | | | | | | | | | | | | |
| 9 | CONV-TILL | | | | | | | | | 93 | 95 | 91 | 98 | 99 | 98 | 96 | 99 | 96 | 94 | | |
| 9 | HARNES XTRA | 5.6 L | | 3.36 LB A/A | | 4.8 PT/A | | PRE | A | | | | | | | | | | | | |
| 10 | NO-TILL | | | | | | | | | 98 | 99 | 98 | 93 | 92 | 92 | 97 | 96 | 96 | 98 | | |
| 10 | ROUNDUP ULTRA | 3 SL | | 0.75 LB AE/A | | 2.0 PT/A | | 4-6"W-2 C | | | | | | | | | | | | | |
| 10 | AMS | 100 DRY | | 2.0 % W/W | | 17 LB/100 GAL | | 4-6"W-2 C | | | | | | | | | | | | | |
| 11 | STRIP-TILL | | | | | | | | | 99 | 99 | 98 | 91 | 88 | 89 | 97 | 98 | 97 | 98 | | |
| 11 | ROUNDUP ULTRA | 3 SL | | 0.75 LB AE/A | | 2.0 PT/A | | 4-6"W-2 C | | | | | | | | | | | | | |
| 11 | AMS | 100 DRY | | 2.0 % W/W | | 17 LB/100 GAL | | 4-6"W-2 C | | | | | | | | | | | | | |
| 12 | CONV-TILL | | | | | | | | | 97 | 97 | 97 | 95 | 93 | 93 | 97 | 96 | 97 | 93 | | |
| 12 | ROUNDUP ULTRA | 3 SL | | 0.75 LB AE/A | | 2.0 PT/A | | 4-6"W-1 B | | | | | | | | | | | | | |
| 12 | AMS | 100 DRY | | 2.0 % W/W | | 17 LB/100 GAL | | 4-6"W-1 B | | | | | | | | | | | | | |
| LSD (P=.05) | | | | | | | | | | 2.2 | 3.3 | 3.7 | 2.3 | 3.7 | 5.3 | 2.2 | 2.2 | 2.5 | 3.1 | 3.7 | 4.3 |
| Replicate F | | | | | | | | | | 0.915 | 1.507 | 1.255 | 0.967 | 0.454 | 1.141 | 1.703 | 0.734 | 1.399 | 3.774 | 2.217 | 2.630 |
| Replicate Prob(F) | | | | | | | | | | 0.4784 | 0.2027 | 0.2967 | 0.4463 | 0.8086 | 0.3499 | 0.1492 | 0.6011 | 0.2389 | 0.0052 | 0.0655 | 0.0334 |
| Treatment F | | | | | | | | | | 3174.839 | 1436.881 | 1133.131 | 2869.322 | 1062.831 | 518.314 | 3301.487 | 3197.580 | 2512.073 | 1597.261 | 1132.721 | 802.024 |
| Treatment Prob(F) | | | | | | | | | | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

Weed Management in Strip-Tillage Corn.

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Trial Comments

1. Protocol; SIU - BGY.
2. Blanket application of Roundup Ultra Max 0.38 lb ae/A plus Weedone 638 0.50 lb ai/A, as needed prior to planting to ensure no vegetation at planting.
3. DAT = days after postemergence application.
 - 14 days after 4-6"W-1 and 4-6"W-2 was on 6-25-01 and 6-27-01, respectively. PRE only treatments were rated 6-8-01.
 - 28 days after 4-6"W-1 and 4-6"W-2 was on 7-9-01 and 7-11-01, respectively. PRE only treatments were rated 7-26-01.
 - 56 days after 4-6"W-1 and 4-6"W-2 was on 8-6-01 and 8-8-01, respectively. PRE only treatments were rated 8-6-01.
4. Plant height average of 2 plants per plot, to the top of the whorl.