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# Weed Control with Postemergence Applications of Status, Armezon, Atrazine, Corvus, Verdict, and Roundup PowerMax in Irrigated Corn

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## Abstract

All postemergence herbicides provided greater than 98% control of quinoa, common sunflower, Palmer amaranth, and green foxtail. Crabgrass and Russian thistle were more difficult to control. All postemergence herbicides except Roundup PowerMax (glyphosate) alone controlled Russian thistle and crabgrass greater than 89%. Diflexx (dicamba) plus Roundup PowerMax was slightly more efficacious on kochia than Status (diflufenzopyr + dicamba) plus Armezon (topramezone) with atrazine and Roundup PowerMax, and all other herbicides were intermediate for kochia control. Corn yields did not differ between herbicide treatments. However, all herbicides increased grain yields.



## Keywords

irrigated corn, weed control, postemergence applications, kochia, quinoa, common sunflower, Palmer amaranth, green foxtail, Status, Dicamba, Diflufenzopyr, Armezon, Topramezone, Atrazine, Corvus, Isoxaflutole, Thiencarbazone, Verdict, Dimethenamid, Saflufenacil, Roundup PowerMax, glyphosate

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*R. Currie and P. Geier*

## Summary

All postemergence herbicides provided greater than 98% control of quinoa, common sunflower, Palmer amaranth, and green foxtail. Crabgrass and Russian thistle were more difficult to control. All postemergence herbicides except Roundup PowerMax (glyphosate) alone controlled Russian thistle and crabgrass greater than 89%. Diflexx (dicamba) plus Roundup PowerMax was slightly more efficacious on kochia than Status (diflufenzopyr + dicamba) plus Armezon (topramezone) with atrazine and Roundup PowerMax, and all other herbicides were intermediate for kochia control. Corn yields did not differ between herbicide treatments. However, all herbicides increased grain yields.

## Introduction

It has long been known that Status, Armezon, atrazine, Corvus (isoxaflutole + thiencarbazone), Verdict (saflufenacil + dimethenamid), and glyphosate can provide excellent weed control in corn. However, with the advent of glyphosate resistant Palmer amaranth it has become much more important to use combinations of herbicides with different modes of action applied at different times to provide control of resistant populations. Therefore, it was the objective of this study to measure the impact of these herbicides at various rates and timings.

## Procedures

An experiment conducted at the Kansas State University Southwest Research-Extension Center near Garden City, KS, investigated the efficacy of postemergence Status (diflufenzopyr + dicamba), Armezon (topramezone), atrazine, and Roundup PowerMax (glyphosate) in corn. The experimental area was overseeded with a mixture of kochia, green foxtail, crabgrass, common sunflower, and quinoa (as a proxy for wild lambsquarters) seed prior to corn planting. All other weed populations were naturally occurring. All herbicide plots received a preemergence application of Verdict (saflufenacil + dimethenamid) at 10 oz/a or Corvus (isoxaflutole + thiencarbazone) at 3.0 oz/a on April 23, 2015. Postemergence herbicides were applied June 4, 2015 when corn was 6 to 9 inches tall and weeds were 2 to 8 inches tall. All herbicides were applied using a tractor-mounted, $CO_2$-pressurized sprayer delivering 20 gpa at 30 psi and 3 mph. Soil was a Ulysses silt loam with 1.4% organic matter, pH of 8.0, and cation exchange

capacity of 18.4. Plots were 10 by 35 feet, and arranged as a randomized complete block replicated four times. Weed control was visually determined July 31, 2015, 57 days after postemergence treatment (DAPT). Grain yields were determined by mechanically harvesting the center two rows of each plot on October 10, 2015, and adjusting the weights to 15.5% moisture.

## Results and Discussion

All postemergence herbicides provided 98 to 100% control of quinoa, common sunflower, Palmer amaranth, and green foxtail at 57 DAPT. All postemergence herbicides except Roundup PowerMax alone controlled Russian thistle and crabgrass 89% or more at 57 DAPT. Diflexx plus Roundup PowerMax was slightly more effective on kochia than Status plus Armezon with atrazine and Roundup PowerMax (99 compared 91% control), and all other herbicides were intermediate for kochia control. Corn yields did not differ between herbicide treatments, but all herbicides increased grain yields 200% or more compared to the untreated checks.

**Table 1. Application information.**

| Application timing | Preemergence | Postemergence |
|---|---|---|
| Application date | April 23, 2015 | June 6, 2015 |
| Air temperature (°F) | 53 | 83 |
| Relative humidity (%) | 62 | 50 |
| Soil temperature (°F) | 52 | 76 |
| Wind speed (mph) | 4 to 8 | 6 to 8 |
| Wind direction | North | North |
| Soil moisture | Good | Good |

**Table 2. Weed control with postemergence applications of Status, Armezon, atrazine, and Roundup PowerMax in irrigated corn.**

| | | | 57 days after POST application | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Treatment | Rate[a] | Timing | SASKR[b] | KCHSC[c] | CHEQU[d] | HELAN[e] | AMAPA[f] | DIGSS[g] | SETVI[h] | Yield |
| | oz/a | | % visual | | | | | | | bu/a |
| Verdict | 10 | PRE | 78 | 95 | 100 | 100 | 98 | 83 | 98 | 195.3 |
| Roundup PowerMax | 22 0.25% | POST POST | | | | | | | | |
| NIS | | | | | | | | | | |
| Verdict | 10 | PRE | 99 | 97 | 100 | 100 | 100 | 91 | 100 | 194.1 |
| Status | 3.75 | POST | | | | | | | | |
| Armezon | 0.75 | POST | | | | | | | | |
| Atrazine | 16 | POST | | | | | | | | |
| Roundup PowerMax | 22 0.25% | POST POST | | | | | | | | |
| MSO | | | | | | | | | | |
| Verdict | 10 | PRE | 93 | 91 | 100 | 100 | 100 | 89 | 100 | 200.3 |
| Status | 2.5 | POST | | | | | | | | |
| Armezon | 0.5 | POST | | | | | | | | |
| Atrazine | 16 | POST | | | | | | | | |
| Roundup PowerMax | 22 0.25% | POST POST | | | | | | | | |
| MSO | | | | | | | | | | |
| Verdict | 10 | PRE | 91 | 94 | 100 | 100 | 100 | 93 | 100 | 196.7 |
| Armezon | 0.75 | POST | | | | | | | | |
| Atrazine | 16 | POST | | | | | | | | |
| Roundup PowerMax | 22 0.25% | POST POST | | | | | | | | |
| MSO | | | | | | | | | | |
| Verdict | 10 | PRE | 94 | 93 | 100 | 100 | 100 | 90 | 100 | 183.4 |
| Status | 3.75 | POST | | | | | | | | |
| Roundup PowerMax | 22 0.25% | POST POST | | | | | | | | |
| MSO | | | | | | | | | | |
| Corvus | 3.0 | PRE | 99 | 99 | 100 | 100 | 100 | 90 | 100 | 199.8 |
| Diflexx | 10 | POST | | | | | | | | |
| Roundup PowerMax | 22 0.25% | POST POST | | | | | | | | |
| MSO | | | | | | | | | | |
| Untreated | --- | --- | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 92.5 |
| LSD (0.05) | | | 6.8 | 6.6 | NS | NS | 3.0 | 5.6 | 1.7 | 44.7 |

[a] NIS is nonionic surfactant, MSO is methylated seed oil.
[b] SASKR is Russian thistle.
[c] KCHSC is kochia.
[d] CHEQU is quinoa.
[e] HELAN is common sunflower
[f] AMAPA is Palmer amaranth.
[g] DIGSS is crabgrass.
[h] SETVI is green foxtail.


**Figure 1. Untreated control.**


**Figure 2. Verdict 10 oz + Roundup PowerMax 22 oz + NIS 62 days after postemergence treatment.**


**Figure 3. Verdict 10 oz + Status 3.75 oz + Armezon 0.75 oz + atrazine 16 oz + Roundup PowerMax 22 oz + MSO 62 days after postemergence treatment.**


**Figure 4. Verdict 10 oz + Armezon 0.75 oz + atrazine 16 oz + Roundup PowerMax 22 oz + MSO 62 days after postemergence treatment.**


**Figure 5. Verdict 10 oz + Status 3.75 oz + Roundup PowerMax 22 oz + MSO 62 days after postemergence treatment.**