

Winter and Early Spring Herbicides for Kochia Control in Fallow

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Summary

A study was initiated near Garden City, KS, in fall of 2015 and spring of 2016 comparing the weed control of several herbicide treatments and their time of application for kochia control in fallow. All herbicide treatments applied in December 2015 provided 99 or 100% kochia control in early spring. However, control declined to less than 60% with these treatments by June 8, 2016. Spring-applied herbicides were generally more efficacious than winter-applied herbicides on June 8, with the best control from treatments of Clarity (dicamba) plus atrazine with or without Zidua (pyroxasulfone) (88 to 89%).

Introduction

Atrazine, Clarity, Corvus (isoxaflutole + thienencarbazone), OpTill (saflufenacil + imazethapyr), Sharpen (saflufenacil), and Zidua have all been shown to effect kochia control. However, information is needed on how to combine these products in tank mixes and when to apply them. Therefore, it was the objective of this research to explore various combinations and timings of application of these products for kochia control.

Experimental Procedures

An experiment at the Kansas State University Southwest Research-Extension Center near Garden City, KS, examined the efficacy of winter and early spring herbicide applications for kochia control in fallow. Herbicides were applied December 3, 2015, and March 14, 2016. 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 in a randomized complete block replicated four times. A tractor-mounted, compressed-CO₂ sprayer delivering 20 GPA at 3.0 mph and 30 psi was used to apply all herbicides. Kochia plants in the spring averaged less than 0.5-inch tall and 100 plants/10 ft² on March 14. Visual weed control was determined on March 7, April 1, and June 8, 2016, which was 95 days after winter applications and 18 and 86 days after spring applications, respectively.

Results and Discussion

All herbicide treatments applied in December 2015 provided 99 or 100% kochia control on March 7 and April 1, 2016. However, control declined to less than 60% with these treatments by June 8. Spring-applied herbicides were generally more effective than winter-applied herbicides on June 8, with the best control from treatments of Clarity plus atrazine with or without Zidua (88 to 89%). Previous work has also shown

a reduced control with winter application (Proc. North Central Weed Sci. Soc. 70:49-50). However, these studies did not show as severe a penalty for winter application due to different patterns of fall and winter precipitation. Although the weed control shown here in June is not commercially acceptable, it was likely good enough to allow a later application with paraquat combined with atrazine or metribuzin to maintain adequate control further into the season.

Reference

Currie, R.S., P.W. Geier, C.R. Thompson. Comparisons of winter versus early spring preemergence herbicide applications for kochia control in fallow. Proc. North Central Weed Sci. Soc. 70:49-50

Table 1. Winter and spring herbicide applications for kochia control

| Herbicide | Rate oz/a | Timing | Kochia | | |
|-------------------------------------|--------------|--------|-----------------------|---------|--------|
| | | | March 7 | April 1 | June 8 |
| | | | ----- % control ----- | | |
| Clarity | 16 | Winter | 100 | 100 | 53 |
| Atrazine | 24 | Winter | | | |
| Sharpen | 2 | Winter | 99 | 99 | 45 |
| Atrazine | 24 | Winter | | | |
| Sharpen | 2 | Winter | 100 | 100 | 53 |
| Atrazine | 24 | Winter | | | |
| Clarity | 8 | Winter | | | |
| Zidua | 2.5 | Winter | 100 | 100 | 55 |
| Atrazine | 24 | Winter | | | |
| Clarity | 8 | Winter | | | |
| OpTill | 2 | Winter | 100 | 100 | 59 |
| Zidua | 2 | Winter | | | |
| Clarity | 8 | Winter | | | |
| Corvus | 3.3 | Winter | 100 | 100 | 53 |
| Atrazine | 24 | Winter | | | |
| Clarity | 8 | Winter | | | |
| Clarity | 16 | Spring | --- | 65 | 88 |
| Atrazine | 24 | Spring | | | |
| Sharpen | 2 | Spring | --- | 70 | 74 |
| Atrazine | 24 | Spring | | | |
| Sharpen | 2 | Spring | --- | 70 | 73 |
| Atrazine | 24 | Spring | | | |
| Clarity | 8 | Spring | | | |
| Zidua | 2.5 | Spring | --- | 63 | 89 |
| Atrazine | 24 | Spring | | | |
| Clarity | 8 | Spring | | | |
| OpTill | 2 | Spring | --- | 60 | 58 |
| Zidua | 2 | Spring | | | |
| Clarity | 8 | Spring | | | |
| Corvus | 3.3 | Spring | --- | 75 | 64 |
| Atrazine | 24 | Spring | | | |
| Clarity | 8 | Spring | | | |
| Untreated | --- | --- | 0 | 0 | 0 |
| Least significant difference (0.05) | | | 2 | 6 | 7 |



Figure 1. Untreated control.



Figure 2. Clarity 16 oz + atrazine 24 oz applied in winter, 195 days after treatment.



Figure 3. Zidua 2.5 oz + atrazine 24 oz + Clarity 8 oz applied in winter, 195 days after application.



Figure 4. Clarity 16 oz + atrazine 24 oz applied in spring, 93 days after treatment.



Figure 5. Zidua 2.5 oz + atrazine 24 oz + Clarity 8 oz applied in spring, 93 days after application.