

## Industrial Weed Control with Plainview SC

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### Summary

The objective of this research was to determine application variable influence on Plainview SC (aminocyclopyrachlor/imazapyr/indaziflam) efficacy in an industrial setting. Plainview SC was applied at three rates and three application timings using two nozzle types to compare season-long weed control in noncropland. Late-season kochia control was best when Plainview SC was applied at 48 or 64 oz/a using flat-fan nozzles. Application timing did not affect these treatments. Similar control using the boomless nozzle required 64 oz/a of Plainview SC be applied either in fall or winter.

### Introduction

Maintaining season-long, weed free conditions at industrial sites has several benefits. Locations such as power stations, railroads, and rights-of-way use nonselective, persistent herbicides to improve visibility, reduce fire hazards, and facilitate maintenance. Sprayers equipped with boomless nozzles are popular for these applications due to their ease of use and minimal input costs compared to traditional boom sprayers. The objective of the study was to compare Plainview SC at three rates and three application timings using two nozzle systems for efficacy in noncropland.

### Experimental Procedures

An experiment was conducted to evaluate persistent, nonselective herbicides at three application timings and three rates for season-long weed control in an industrial setting. Herbicides were applied using either standard flat-fan nozzles or a boomless nozzle. A tractor-mounted, compressed-CO<sub>2</sub> sprayer delivering 25 gpa was used to apply all herbicides. Pressure and ground speed for the flat-fan nozzles were 30 psi and 4.1 mph, whereas 60 psi and 3.0 mph were used for the boomless nozzle applications. Application and environmental conditions are shown in Table 1. Plots size was 10 by 35 feet and arranged in a randomized complete block with four replications. Soil was a Ulysses silt loam with 2.7% organic matter, pH of 7.9, and CEC of 28.4. Visual weed control was determined on May 5, July 5, and October 3, 2022. These dates were 1, 3, and 6 months after the spring applications (MA-C), respectively.

### Results and Discussion

Kochia control was 98% or more with all treatments except Plainview SC at 32 oz/a applied in the fall using a boomless nozzle at 1 MA-C, or any rate of Plainview SC applied in the spring using a boomless nozzle (Table 2). These treatments also controlled kochia less than 90% at 3 MA-C. By 6 MA-C, kochia control was best when Plainview SC at 48 or 64 oz/a was applied through flat-fan nozzles regardless of application timing. Similar kochia control at 6 MA-C with the boomless nozzle only occurred

when Plainview SC was applied at 64 oz/a in the fall or winter (80 to 83%). These results indicate that higher rates and earlier application times are needed when using boomless nozzle systems compared to traditional sprayers.

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**Table 1. Application, environmental, and weed data for the industrial weed control study**

| <b>Application timing</b>       | <b>Fall</b>       | <b>Winter</b>     | <b>Spring</b>   |
|---------------------------------|-------------------|-------------------|-----------------|
| Application date                | November 15, 2021 | February 18, 2022 | April 4, 2022   |
| Air temperature, °F             | 81                | 58                | 65              |
| Relative humidity               | 14                | 23                | 20              |
| Soil temperature, °F            | 53                | 42                | 55              |
| Wind speed, mph                 | 3 to 8            | 3 to 6            | 5 to 9          |
| Wind direction                  | North             | Northwest         | South-southeast |
| Soil moisture                   | Dry               | Fair              | Dry             |
| Kochia                          |                   |                   |                 |
| Height, inches                  | ---               | ---               | 0.5             |
| Density, plants/ft <sup>2</sup> | 0                 | 0                 | 10              |

**Table 2. Kochia control in the industrial weed control study**

| <b>Treatment</b>                                  | <b>Rate<sup>1</sup></b> | <b>Timing</b> | <b>Nozzle<sup>2</sup></b> | <b>1 MA-C<sup>3</sup></b> | <b>3 MA-C</b> | <b>6 MA-C</b> |
|---|-------------------------|---------------|---------------------------|---------------------------|---------------|---------------|
|   | lb/a                    |               |                           | ----- % Visual -----      |               |               |
| Plainview SC<br>Glyphosate<br>Nonionic surfactant | 32<br>64<br>0.25%       | Fall          | Flat fan                  | 100                       | 91            | 70            |
| Plainview SC<br>Glyphosate<br>Nonionic surfactant | 48<br>64<br>0.25%       | Fall          | Flat fan                  | 98                        | 96            | 88            |
| Plainview SC<br>Glyphosate<br>Nonionic surfactant | 64<br>64<br>0.25%       | Fall          | Flat fan                  | 100                       | 95            | 88            |
| Plainview SC<br>Glyphosate<br>Nonionic surfactant | 32<br>64<br>0.25%       | Fall          | Boomless                  | 93                        | 81            | 68            |
| Plainview SC<br>Glyphosate<br>Nonionic surfactant | 48<br>64<br>0.25%       | Fall          | Boomless                  | 100                       | 91            | 79            |
| Plainview SC<br>Glyphosate<br>Nonionic surfactant | 64<br>64<br>0.25%       | Fall          | Boomless                  | 100                       | 93            | 80            |
| Plainview SC<br>Glyphosate<br>Nonionic surfactant | 32<br>64<br>0.25%       | Winter        | Flat fan                  | 100                       | 94            | 78            |
| Plainview SC<br>Glyphosate<br>Nonionic surfactant | 48<br>64<br>0.25%       | Winter        | Flat fan                  | 99                        | 98            | 89            |
| Plainview SC<br>Glyphosate<br>Nonionic surfactant | 64<br>64<br>0.25%       | Winter        | Flat fan                  | 100                       | 98            | 91            |
| Plainview SC<br>Glyphosate<br>Nonionic surfactant | 32<br>64<br>0.25%       | Winter        | Boomless                  | 99                        | 91            | 70            |
| Plainview SC<br>Glyphosate<br>Nonionic surfactant | 48<br>64<br>0.25%       | Winter        | Boomless                  | 100                       | 93            | 79            |
| Plainview SC<br>Glyphosate<br>Nonionic surfactant | 64<br>64<br>0.25%       | Winter        | Boomless                  | 100                       | 96            | 83            |
| Plainview SC<br>Glyphosate<br>Nonionic surfactant | 32<br>64<br>0.25%       | Spring        | Flat fan                  | 99                        | 93            | 74            |
| Plainview SC<br>Glyphosate<br>Nonionic surfactant | 48<br>64<br>0.25%       | Spring        | Flat fan                  | 100                       | 96            | 83            |

*continued*

**Table 2. Kochia control in the industrial weed control study**

| Treatment           | Rate <sup>1</sup> | Timing | Nozzle <sup>2</sup> | 1 MA-C <sup>3</sup>  | 3 MA-C | 6 MA-C |
|---------------------|-------------------|--------|---------------------|----------------------|--------|--------|
|                     | lb/a              |        |                     | ----- % Visual ----- |        |        |
| Plainview SC        | 64                | Spring | Flat fan            | 100                  | 97     | 90     |
| Glyphosate          | 64                |        |                     |                      |        |        |
| Nonionic surfactant | 0.25%             |        |                     |                      |        |        |
| Plainview SC        | 32                | Spring | Boomless            | 76                   | 79     | 65     |
| Glyphosate          | 64                |        |                     |                      |        |        |
| Nonionic surfactant | 0.25%             |        |                     |                      |        |        |
| Plainview SC        | 48                | Spring | Boomless            | 81                   | 83     | 73     |
| Glyphosate          | 64                |        |                     |                      |        |        |
| Nonionic surfactant | 0.25%             |        |                     |                      |        |        |
| Plainview SC        | 64                | Spring | Boomless            | 79                   | 80     | 74     |
| Glyphosate          | 64                |        |                     |                      |        |        |
| Nonionic surfactant | 0.25%             |        |                     |                      |        |        |
| LSD (0.05)          |                   |        |                     | 5                    | 7      | 14     |

<sup>1</sup> Plainview SC rate is pounds ai/a, glyphosate rate is pounds ae/a.

<sup>2</sup> Flat fan nozzles were six TeeJet TT11003, boomless nozzle was a single TeeJet OC-12.

<sup>3</sup> MA-C = months after the spring applications.



**Figure 1. Untreated control.**



**Figure 2. Plainview SC 64 oz/a plus glyphosate 64 oz/a, applied in the fall using flat fan nozzles. Photo taken 246 days after the fall treatments.**



**Figure 3. Plainview SC 64 oz/a plus glyphosate 64 oz/a, applied in winter using flat fan nozzles. Photo taken 151 days after the winter applications.**



**Figure 4. Plainview SC 32 oz/a plus glyphosate 64 oz/a, applied in the spring using a boomless nozzle. Photo taken 106 days after the spring applications.**



**Figure 5. Plainview SC 64 oz/a plus glyphosate 64 oz/a, applied in the spring using a boomless nozzle. Photo taken 106 days after the spring applications.**