



Result Demonstration Report

2024 ENVU Herbicide Comparison Study Using Aerial Drone Application Comparing Herbicide Effectiveness of Non-Picolinic and Picolinic Acid Chemistries

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Summary

Herbicides have been proven to be an effective method for controlling weeds in warm season forage systems. Woolly Croton, Slender Dayflower, Blackberry, Horsemint, Maretail, Black-Eyed Susan, Carolina Horse Nettle, and Bull Nettle were the primary weeds inhabiting the test area. Producers face many choices when selecting various products to be used in forage systems for adequate weed control. We compared herbicide efficacy of using Aerial Drone Applicator and the recommended rates of herbicides to compare herbicide efficacy comparing weed control of a non-picolinic and picolinic acid herbicide.

Objective

The objective of this result demonstration was to compare herbicide efficacy of using Aerial Drone Applicator and the recommended label rates of herbicides to compare herbicide efficacy comparing weed control of non-picolinic and picolinic acid herbicide chemistry.

Materials and Methods

Herbicide Comparison Trials were established on June 17, 2024. Using an aerial drone calibrated at 2 gallons of spray solution per acre. All treatments used 90-10 non-ionic surfactant (NIS) and a drift control agent.

Application System Data (drone)

- Aircraft Manufacture and model (DJI-T-40)
- Rotor Width: 9 ft
- Nozzle type: Sprinklers
- Nozzle Angle: Straight Down
- Swath width: 30 ft
- Pressure: 30 PSI
- Application Speed: 22 MPH
- Time: 9:30 p.m.- 11:30 p.m.
- Air Temperature: 81°
- Soil Temperature: 80°
- Relative Humidity: 83%
- Wind: SSE at 6 mph
- Cloud Cover: 90%

Table I. Herbicide & Rates Used in Study

Plot	Herbicide	Application Rate/Acre	90/10 NIS & Drift Control Agent Rate/Acre
1	Cimarron Plus	1 oz.	4.8 oz & 8 oz
2	Cimarron Plus + 2,4-D	1 oz. + 16 oz.	4.8 oz & 8 oz
3	Grazon P+D3	20 oz.	4.8 oz & 8 oz
4	Cimarron Plus + Dicamba	1 oz. + 8 oz.	4.8 oz & 8 oz

Trade names of commercial products used in this report is included only for better understanding and clarity. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by Texas AgriLife Extension Service and the Texas A&M University System is implied. Readers should realize that results from one experiment do not represent conclusive evidence that the same response would occur where conditions vary.

Results and Discussion

Herbicide Efficacy Evaluation Details

Simple percent visual control of target species and percent visual desirable grass phytotoxicity (if present) were recorded at monthly intervals post application. Three randomly selected areas of observation per treatment for broadleaves were evaluated and combined into a plot mean. Date of evaluation and a reference to the number of months after applications for targeted weeds were reported. Ratings were evaluated at approximately 2 weeks after treatment (WAT), 30, 60 & 90 days after treatment (DAT) and at the end of the season. Results are listed in Table II. Table III shows the cost of each individual treatment for one-acre rate of tank mix (herbicide only).

Table II. Percent Control for 2 (WAT) 30, 60, & 90 (DAT) and End of Season

Plot	Herbicide	Application Rate/Acre	2WAT % Control	30DAT % Control	60DAT % Control	90DAT % Control	End of Season
1	Cimarron Plus	1 oz	Discoloration	85	99	99	99
2	Cimarron Plus + 2,4-D	1 oz + 16 oz	Discoloration	85	99	99	99
3	Grazon P+D3	20 oz	Discoloration	85	99	99	99
4	Cimarron Plus + Dicamba	1 oz + 8 oz	Discoloration	85	99	99	99

Table III. 2024 ENVU Herbicide Comparison Study Using Aerial Drone Non-Picolinic vs Picolinic Acid Chemistries

<u>Herbicide (s)</u>	<u>Application Rates/Acre</u>	<u>Cost (\$)/Acre</u>
Cimarron Plus	1 oz	\$9.46
Cimarron Plus + 2,4-D	1 oz + 16 oz	\$12.00
Grazon P+D3	20 oz	\$10.40
Cimarron Plus + Dicamba	1 oz + 8 oz	\$11.38

* Costs are the average retail prices from Rozell Sprayers & Manufacturing and Azelis in Tyler, Texas (February 28, 2025) for Herbicide Only no, Surfactant

Cimarron Plus = \$94.56 for 10 oz= \$9.46 per oz.

2,4-D= \$50.88 per 2.5 gallons= \$50.88/320 oz= \$0.159/oz x 16 oz per acre= \$2.54 per acre

Grazon P+D3 = \$133 per 2 gallon = \$133/256 oz= \$0.52/ oz x 20 oz per acre rate = \$10.40 per acre

Dicamba= \$77.05 per 2.5 gallon= \$77.05/320 oz=\$0.24/oz x 8 oz per acre rate= \$1.92 per acre.



Spraying Trial



Landing



Refilling & Changing Battery



Before Application



30 DAT



60 DAT



90 DAT



End of Season

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Conclusions

Technology is dynamic and is adapting to different farming practices. Positive results have occurred. Herbicide efficacy in these result demonstration trials were the same. Herbicides have proven to be an effective way of controlling weeds in warm-season forage systems using an aerial drone.

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