Texas Cooperative EXTENSION
The Texas A&M University System

Comparison of Herbicides and Carriers for Broadcast Pricklypear Control

2006

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Summary

This herbicide trial, replicated across 11 counties, compares the herbicides Tordon 22K and Surmount, and the spray carriers water + surfactant, MSO and 5% diesel, when applied by ground broadcast spray equipment for control of pricklypear.

One year following treatment, average control ranged from 54% to 67%. There were no significant differences between treatments regardless of the herbicide or carrier used. Tordon 22K showed a moderate positive relationship between fungas damage of pricklypear and the control achieved. There was no measurable relationship between pricklypear control between Surmount and fungus damage to the pricklypear pads.

This data should be considered preliminary. Final control will not be determined until 2007.

Problem/Introduction

Surmount is a relatively new herbicide labeled for control of pricklypear on Texas rangelands. Currently the broadcast recommended rate is 4 pt/ac, which is double the rate for the older, standard recommendation of 2 pt/ac of Tordon 22K. The higher rate recommendation for Surmount negates any cost advantage when using Surmount as compared to Tordon 22K. Currently Surmount sells for $50+/gal as compared to $90+ for Tordon 22K. The higher recommended broadcast rate for Surmount is due in some part to a lack of data documenting control of pricklypear following applications of Surmount at lower rates in various locations and under varying environmental conditions.

Carriers (what is mixed with the herbicide) also influence efficacy. At the present time, Texas Cooperative Extension and the Texas Agricultural Experiment Station recommend an oil:water emulsion for aerial broadcast treatments and either an oil:water emulsion or water + surfactant for ground broadcast applications. Many commercial applicators have begun to use methylated seed oil (MSO) as a herbicide carrier for pricklypear control. There is little data available comparing the carrier options.

Objectives

The objectives of this herbicide trial are to:

1) Compare Surmount to Tordon 22K when applied by ground broadcast for control of pricklypear.
2) Compare MSO, oil:water emulsion (5% diesel) and water plus surfactant for efficacy when used as herbicide carrier for ground broadcast applications on pricklypear.

Materials/Methods

Table 1 provides specific information concerning the county, ranch and date applied for the 11 replications included in this herbicide trial. Treatments applied at each location included the herbicide Surmount at a rate of 4 pt/ac with either water + surfactant, MSO or oil:water emulsion (5% diesel) as the carrier. A fourth Surmount treatment reduces the rate to 3 pt/ac and uses the oil:water emulsion as a carrier. Tordon 22K is included at a rate of 2 pt/ac with both water + surfactant and oil:water emulsion carriers.

All applications were made using a 4-wheel ATV equipped with a 3.7 gpm Flowjet pump, 2 – 10 gal spray tanks and a KLC 9 Fieldjet nozzle, producing a 15 ft spray swath.. Spraying was conducted at 20 psi and a total volume of 10.7 gpa. Plot size was approximately ½ acre for each treatment.

Table 1. County, Ranch and Date Applied.

County	Ranch	Date Established
Brown	Rodgers	7/19/2005
Burnet	Brownlee	7/26/05
Coleman	Knox	8/2/05
Coke	Coke. Co. Airport	6/22/05
Concho	Sims	6/7/05
Irion	Holphacet	7/28/05
Lampasas	Preston	6/1/05
McCulloch	Phillips	6/27/05
Mason	Martin	8/9/05
Menard	McWilliams	7/20/05
San Saba	Sloan	5/25/05

Results/Discussion/Economic Impact

One year following treatment, average apparent mortality of pricklypear ranged from 53% to 67%, depending on the herbicide and carrier used (Table 2). There were no significant differences between treatment means. Pricklypear control following treatment with herbicides often occurs slowly over a period of 2 to 3 years. Control can be expected to improve for some or all of the treatments over the next growing season.

At the date of treatment, many of the locations exhibited significant damage to the pricklypear pads due to a widespread fungus infection occurring across most of Texas. The damage ranged from 0% to 90% of the pads, depending on the location. When simple regression was used to evaluate the impact of the fungus damage on control, it was found that there was a moderate positive relationship between fungus damage and control when using the herbicide Tordon 22K (R^2 = 0.23 to 0.28). There was no consistent relationship between control and fungus damage when using the herbicide Surmount (R^2 = -0.05 to 0.13). While these values were not significant they infer that the fungus damage possibly enhances control following Tordon 22K applications, but is neutral when the herbicide Surmount is used.

Table 2. Percent apparent mortality of pricklypear one year following treatment. There were no significant difference (P=0.05) between treatment means.

	Surmount				Tordon 22K		%
	4 pt/ac			3 pt/ac	2 pt/ac		Fungus
County	Surfactant	MSO	Diesel	Diesel	Surfactant	Diesel	Damage
Mason	70	65	80	70	30	35	20
Menard	80	90	70	55	30	35	50
McCulloch	80	85	90	70	45	80	0
San Saba	60	40	25	30	25	30	0
Burnet	10	5	80	60	70	90	50
Brown	40	65	50	25	50	60	50
Irion	75	60	80	60	80	75	10
Lampasas	45	35	20	10			10
Concho	85	75	83	70	65	70	90
Coke	93	90	95	80	90	90	50
Average	64	61	67	53	54	63	29

Acknowledgements

The authors wish to express appreciation to the ranches that served as cooperators for this herbicide trial. Special thanks are extended to Dow AgroSciences who furnished both financial support and the herbicides used.

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