

Long-Term Mesquite Management Using Leaf-Spray Individual Plant Treatments

Robert K. Lyons, Extension Range Specialist, Uvalde
Maron Finley, County Extension Agent, Bastrop County
Travis Franke, County Extension Agent, Guadalupe County
Jeff Hanselka, County Extension Agent, Guadalupe County
Jason Ott, County Extension Agent, Medina County
Mike McDougall, County Extension Agent, Real County



SUMMARY

Results of this project show that mesquite plant densities and sizes can be reduced to manageable levels with follow-up treatments. Results also indicate that treatment of mesquite while plant density is low and/or plant size is small provides substantial reductions in treatment costs. Total long-term treatment costs could have been even lower if treatments had been applied when plant density was low and/or while plant size was small. For example, average long-term per acre cost was 43% lower excluding the initial treatment year. Highest long-term treatments costs occurred where initial plant densities and sizes were greatest.

PROBLEM/INTRODUCTION/OBJECTIVES

Individual plant treatments offer ranchers a viable tool for brush maintenance. This project was established to investigate 1) the cost effectiveness of treating when plant density is low and/or plant size is small, 2) long-term maintenance costs, and 3) potential re-treatment intervals for mesquite management.

MATERIALS/METHODS

In the summer of 1997 and 1999 leaf-spray treatment plots were established in Bastrop, Guadalupe, Real, and Medina counties. Treatments were applied using Brush Buster methods by 2 to 3-person crews using an ATV equipped with spray tanks and 3 sprayguns equipped with 5500-X8 Adjustable Conejet Nozzles. Plants were treated with a mixture of 0.5% Reclaim (clopyrolid) + 0.5% Remedy (triclopyr) + 0.25% surfactant + 0.25% HiLite Blue Dye in water. Plant kill was evaluated each year following initial treatment. Because of new seedling emergence and/or survival of initially treated plants, follow-up treatments were planned beginning in the second year following initial treatment.

RESULTS/DISCUSSION/ECONOMIC IMPACT

Average apparent 1-year plant mortality was above 75% for initial, second, third, and fourth treatments (Table 1). Only the Guadalupe County site has been treated four times. In each county, a follow-up treatment was applied 2 years after the initial treatment resulting in plant densities and plant sizes that were reduced to manageable levels after two treatments (Table 2). Also, per plant treatment costs and/or per acre treatment costs were reduced (Table 3). In Bastrop County, per plant follow-up treatment costs were higher than the initial cost because plants in this treatment were relatively large survivors of the initial treatment. Few seedling plants were encountered in the Bastrop follow-up treatment. In contrast, in Guadalupe County, per plant and per acre follow-up costs were 33 and 36%, respectively, of initial treatment costs. In this county, plants treated in the follow-up were mostly seedlings. Real County follow-up treatment costs were also lower than those in Bastrop County, with per plant and per acre follow-up costs at 39 and 26%, respectively, of initial costs. Lowest treatment costs were in Medina County where initial plant density was low and plants were relatively small.

Intervals between treatments averaged 2.75 years across the four counties. Average interval between treatments was shortest in Guadalupe County at 2.3 years and longest in Bastrop County at 3.75 years. Treatment intervals were determined by what the landowner/manager indicated they wanted to do to maintain control.

Table 1. Apparent plant-kill with followup treatments.

County	Plant mortality, %			
	Initial	2 nd Trt	3 rd Trt	4 th Trt
Bastrop	76	83	80	-
Guadalupe	90	83	80	92
Medina	92	95	-	-
Real	79	62	75	-
Average	82	76	78	-

Table 2. Plant densities per acre for each year.

Year	County			
	Bastrop	Guadalupe	Medina	Real
1997	458 (treated)	167 (treated)	-	260 (treated)
1998	179	81	-	69
1999	179 (treated)	112 (treated)	35 (treated)	176 (treated)
2000	12	45	3	-
2001	35	103	- (treated)	131
2002	35	351 (treated)	3	237 (treated)
2003	45	42	3	88
2004	59 (treated)	98 (treated)	-	102
2005	62	50	-	98

Plots in each county were evaluated each year following initial treatment to decide when to apply follow-up treatments. Long-term costs averaged \$5.26 per acre with a low of \$.91 per acre (Table 3). Highest long-term treatment costs were in Bastrop County where initial plant densities were greatest and in Real County where plant size was greatest (over 6 feet high). Treatment costs per acre declined with follow-up treatments. For example, average cost per acre for the third treatment was 64% less than the average cost for the first treatment. Average cost for the fourth treatment in Guadalupe County was 80% less than for the initial treatment.

Table 3. Comparison of treatment costs per plant and per acre.

County	Treatment \$/plant				Treatment \$/acre				Long-term \$/ac (yrs)
	1 st	2 nd	3 rd	4 th	1 st	2 nd	3 rd	4 th	
Bastrop	0.07	0.12	0.11	-	33	21.56	8.47	-	7.00 (9)
Guadalupe	0.12	0.04	0.09	0.04	25	9	9.31	4.34	5.50 (9)
Medina	0.10		-	-	3.45	2	-	-	0.91 (6)
Real	0.18	0.07	0.10	-	46	12	12.81	-	7.64 (9)
Average	0.12	0.08	0.10	0.04	26.86	11	9.60	4.34	5.26

To provide insight into long-term costs if initial treatments had been applied with lower mesquite densities and smaller plant size, per acre costs were calculated excluding the initial treatment (Table 4). Costs in this analysis averaged \$2.99/acre with an average cost reduction of 43%.

Table 4. Comparison of treatment costs excluding the first-year treatment.

County	Long-term \$/ac (yrs)	Cost Reduction, %
Bastrop	4.29 (7)	39
Guadalupe	3.69 (7)	33
Medina	0.50 (4)	45
Real	3.48 (7)	46
Average	2.99	43

ACKNOWLEDGMENTS

The authors wish to express appreciation to the various ranches that served as cooperators for this project. Special thanks are extended to Dow AgroSciences for furnishing the herbicide used in the trials and for providing financial support for travel and expenses.

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