2012 – Progress Report

Aminocyclopyrachlor for Mesquite Foliar Individual Plant Treatment In Right-of-Way/Non-Crop Areas

Site Locations: Hill, Ellis, Brown, Motley and Childress Counties
Cooperators: Justin Lewis, Farmer Cattle Co., Tracy Chambers, Craig Turner and Larry McAfee
Authors: Will Hatler, Extension Program Specialist, Stephenville
Ryan Collett, County Extension Agent, Hill County
Mark Arnold, County Extension Agent, Ellis County
Scott Anderson, County Extension Agent, Brown County
Ryan Martin, County Extension Agent, Motley County
Lonnie Jenschke, County Extension Agent, Childress County

Summary

Sites were established in 2010-2012 to evaluate the efficacy of non-crop rates of DuPont herbicide MAT28 (aminocyclopyrachlor) when applied to mesquite foliage. Final apparent mortality evaluations were conducted on sites established in 2010 and initial evaluations results are reported for the 2011 site. Evaluations will continue to be made for two years after treatment, at which time plant apparent mortality results will be final.

Objective

Mesquite is the most common noxious plant invading Texas Rangelands. Mesquite densities can reach such proportions as to severely limit desirable forage growth by competing for nutrients, water and sunlight. In addition, large quantities of mesquite bean consumption over a period of time (several months) can be toxic to grazing animals. Small quantities of bean consumption can however be considered as a valuable forage.

DuPont Crop Protection's experimental aminocyclopyrachlor herbicide, currently named MAT28, has been in the testing phase for several years and has the potential to be a very effective product for controlling invasive brush and weed species in non-cropland settings. The objective of this study is to evaluate the effectiveness of MAT28 when applied as an individual plant leaf spray to mesquite.

Materials and Methods

Mesquite individual plant treatments (IPT) were applied in several counties throughout Central and North Texas in 2010-2012. Treatments were applied using backpack sprayers equipped with ConeJet X8 nozzles. The foliage of all mesquite located inside the plots was sprayed to wet, almost to the point of dripping.

Plot sizes were variable, depending on the size and density of plants. Plant condition was also variable, with significant insect damage and new leaf growth occurring at the Ellis County site. All plants at the Hill County site exhibited dark green color with no visible new growth. Plants were also in ideal condition at the 2011 Brown County site, with dark green foliage and good leaf cover. Plants at the Motley County site had moderate insect damage and some visible new growth. Environmental conditions on the day of application for each site are detailed in Table 1 and specific treatment information is detailed in Table 2. It should be noted that herbicide combinations and rates used in this study are not intended for use in range and pasture settings. This study is targeted specifically at control of mesquite in right-of-way/non-crop areas, with high rates of active ingredients that could potentially damage desirable forage plants on range and pasture sites.

Table 1. Environmental conditions on the day of application for foliar mesquite IPT plots established in 2010-2012.

Site	Date	Spray Time	Wind Speed/ Direction	Soil Temp.	Air Temp.	Soil Type/ Moisture	RH
Hill Co.	6/23/10	10:00-11:00	2-5 mph/SE	92°F	99°F	Silty Loam/Low	44%
Ellis Co.	6/26/10	11:00-12:00	1-3 mph/ESE	82°F	90°F	Clay/Low	74%
Brown Co.	8/10/11	8:15-9:30	3-8 mph/S	96°F	88°F	Fine Sandy Loam/Low	47%
Motley Co.	6/26/12	9:00-9:30	2-5 mph/NE	84°F	96°F	Fine Sandy Loam/Low	50%
Childress Co.	6/27/12	10:30-12:15	2-8 mph/E	88°F	102°F	Loam/Low	45%

Table 2. Herbicides and rates of application for foliar mesquite IPT plots established in 2010-2012. Non-ionic surfactant was added to all treatments at 0.5% volume/volume.

Treatment No.	Herbicide	IPT Rate (Product)
1	MAT28 (50% SG) + Escort	4.7 g/gal + 1.2 g/gal
2	MAT28 (50% SG) + Escort	8.5 g/gal + 2.3 g/gal
3	MAT28 (50% SG) + Escort	15.3 g/gal + 4.1 g/gal
4	MAT28 (50% SG) + Imazapyr + Escort	3.3 g/gal + 3.0 g/gal + 0.9 g/gal
5	MAT28 (50% SG) + Imazapyr + Escort	6.5 g/gal + 6.0 g/gal + 1.8 g/gal
6	MAT28 (50% SG) + Imazapyr + Escort	13.1 g/gal + 12.0 g/gal + 3.5 g/gal
7	Remedy Ultra + Reclaim	0.5% v/v + 0.5% v/v

Results and Discussion

Final evaluations were conducted at 2 years after treatment for both 2010 sites (Table 3). At the Ellis County site, the two higher rates of MAT28 + Escort had the highest apparent mortality, rated at 100% and 90%. Results improved substantially between years 1 and 2 for the 3 higher rates of MAT28 + Escort + imazapyr, with the highest rate at 86% apparent mortality. The standard Remedy Ultra + Reclaim also had very high apparent mortality at 85%. No standing treated plants were visible during a brief visit to the Hill County site, and it was assumed that the plants had been removed. A follow up visit will be conducted to confirm this assumption.

Initial evaluation was conducted at 1 year after treatment of the Brown County site (Table 4). The high rate of MAT28 + Escort, which was rated at 86% initial apparent mortality, was the initial standout treatment among those containing aminocyclopyrachlor. The lower rates of the same tank mix also had high initial apparent mortality. Adding imazapyr to the same tank mix provided no initial advantage. The standard Remedy Ultra + Reclaim had the highest initial apparent mortality at 98%. Final evaluation of the 2011 site and initial evaluation of the 2012 sites will be conducted in 2013.

Table 3. Herbicides, rates of application and apparent mortality results for herbicides applied to IPT mesquite plots established in Hill and Ellis Counties in 2010. Non-ionic surfactant was added to all treatments at 0.5% volume/volume.

			% Apparent Mortality			
			Hill Co.		Ellis Co.	
Treatment	Herbicide	IPT Rate (Product)	1 YAT	*2 YAT	1 YAT	2 YAT
1	MAT28 (50% SG) + Escort	4.7 g/gal + 1.2 g/gal	94	--	22	45
2	MAT28 (50% SG) + Escort	8.5 g/gal + 2.3 g/gal	82	--	100	100
3	MAT28 (50% SG) + Escort	15.3 g/gal + 4.1 g/gal	94	--	90	90
4	MAT28 (50% SG) + Imazapyr + Escort	3.3 g/gal + 3.0 g/gal + 0.9 g/gal	86	--	19	19
5	MAT28 (50% SG) + Imazapyr + Escort	6.5 g/gal + 6.0 g/gal + 1.8 g/gal	100	--	14	57
6	MAT28 (50% SG) + Imazapyr + Escort	13.1 g/gal + 12.0 g/gal + 3.5 g/gal	100	--	50	86
7	Remedy Ultra + Reclaim	0.5% v/v + 0.5% v/v	100	--	55	85

*Treated plants were removed prior to the 2-year evaluation at the Hill County site.

Table 4. Herbicides, rates of application and initial apparent mortality results for herbicides applied to IPT mesquite plots established in Brown County in 2011. Non-ionic surfactant was added to all treatments at 0.5% volume/volume.

			% Apparent Mortality	
Treatment	**Herbicide**	**IPT Rate (Product)**	**1 YAT**	**2YAT**
1	MAT28 (50% SG) + Escort	4.7 g/gal + 1.2 g/gal	76	
2	MAT28 (50% SG) + Escort	8.5 g/gal + 2.3 g/gal	68	
3	MAT28 (50% SG) + Escort	15.3 g/gal + 4.1 g/gal	95	
4	MAT28 (50% SG) + Imazapyr + Escort	3.3 g/gal + 3.0 g/gal + 0.9 g/gal	28	
5	MAT28 (50% SG) + Imazapyr + Escort	6.5 g/gal + 6.0 g/gal + 1.8 g/gal	64	
6	MAT28 (50% SG) + Imazapyr + Escort	13.1 g/gal + 12.0 g/gal + 3.5 g/gal	50	
7	Remedy Ultra + Reclaim	0.5% v/v + 0.5% v/v	98	

*Treated plants were removed prior to the 2-year evaluation at the Hill County site.

Acknowledgements

This project was supported by DuPont Crop Protection, Hill, Ellis, Brown, Motley and Childress Counties and the cooperating landowners.