Agriculture and Natural Resources

2012 – Progress Report

Individual Plant Foliar Treatments on Mesquite Using Dow AgroSciences Products

Site Locations: McClennan, Bell, Erath, Stephens, Ellis, Callahan, Childress, Motley, Knox, Dickens, Burleson, Jack, Hood, Kent and McCulloch Counties

Cooperators: McGregor AgriLife Research Station, Five Wells Ranch, Albert Peak, Gary Farmer, Neve Ranch, Denning Ranch, Williams Ranch, A.J. Johnson, Craig Turner, Truscott Brine Lake, Woodson Lumber, Bloodworth Ranch, Langdon Property, Ray Chisholm and Winters Ranch

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Summary

Sites were established in 2010 and 2011 to compare the efficacy of labeled and experimental Dow AgroSciences herbicides when applied to mesquite foliage. Additional trials were established in 2012 to compare the efficacy of Dow's new herbicide Sendero with the industry standard Reclaim plus Remedy Ultra. Initial mortality evaluations are made at one year and final results determined at 2 years after

treatment. Initial results indicate that Reclaim tank mixed with Milestone and Sendero have significant activity when applied to mesquite foliage.

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.

The objective of this study is to compare and document the effectiveness of several labeled and experimental Dow AgroSciences herbicides when applied as an individual plant leaf spray to mesquite.

Materials and Methods

Mesquite individual plant treatments (IPT) were applied in 2010 on the McGregor AgriLife Research Station in McClennan County, Five Wells Ranch in Bell County and the Albert Peak property in Erath County. A similar treatment protocol with differing chemical formulations was applied in 2011 on the Gary Farmer property in Ellis County, Neve Ranch in Stephens County and Denning Ranch in Erath County. Plot sizes were variable, depending on the size and density of plants. Plant condition was also variable, with insect damage ranging from minimal at the McLennan Co. site to significant at the Bell Co. site. Due to site and plant conditions encountered at the Bell Co. site, treatments were prioritized and only 6 of the intended 8 were applied (treatment numbers 5 and 8 were eliminated). Plants exhibited some drought stress and minimal defoliation at the 2011 Ellis Co. site. Plant conditions were good at all other sites, having dark green color with no visible new growth or defoliation.

Additional trials were established in 2012 in ten counties, including; Callahan, Childress, Motley, Knox, Dickens, Burleson, Jack, Hood, Kent and McCulloch. Varying rates of Sendero were compared with the industry standard of Remedy Ultra tank mixed with Reclaim. Plant conditions were ideal at the Knox, Jack and McCulloch County sites. Slight to moderate defoliation by insects was noted at the Callahan, Childress and Motley County sites. The Dickens, Burleson, Hood and Kent County sites had visible new leaf growth, presumably initiated by rainfall.

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. Evaluation of treatment results will be conducted the same at all sites. The number of plants treated was recorded at the time of installation. At intervals of 1 and 2 years after treatment, the number of dead plants within each plot is counted and mortality is given as a percentage of the total number treated. Environmental conditions on the day of application for each site are detailed in Table 1 and specific treatment information is detailed in Table 2.

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

Site	Date	Spray Time	Wind Speed/ Direction	Soil Temp.	Air Temp.	Soil Type/ Moisture	RH
McClennan Co.	8/11/10	9:15-10:00	1-3 mph/NW	82°F	87°F	Silty Clay/Low	65%
Bell Co.	8/12/10	10:30-11:30	1-3 mph/N	83°F	97°F	Clay/Low	75%
Erath Co.	8/30/10	1:30-2:30	3-9 mph/N	84°F	96°F	Sandy Loam/Low	70%
Ellis Co.	7/6/11	10:45-11:20	1-3 mph/SW	88°F	96°F	Clay/Low	48%
Stephens Co.	8/9/11	9:30-10:30	4-10 mph/SW	95°F	96°F	Clay Loam/Low	47%
Erath Co.	8/11/11	9:00-10:30	6-13 mph/SW	96°F	88°F	Fine Sand/Low	63%
Callahan Co.	6/6/12	10:15-11:30	2-6 mph/SW	82°F	78°F	Clay Loam/Low	58%
Childress Co.	6/27/12	8:30-9:45	2-5 mph/S	85°F	91°F	Loam/Low	50%
Motley Co.	6/26/12	10:30-12:00	2-7 mph/SW	84°F	96°F	Sandy Loam/Low	45%
Knox Co.	6/28/12	9:30-11:00	2-9 mph/W	88°F	98°F	Clay/Low	45%
Dickens Co.	7/17/12	10:00-12:00	8-12 mph/SW	82°F	88°F	Sandy/Low	53%
Burleson Co.	7/24/12	9:45-10:45	2-7 mph/SW	83°F	95°F	Loam/Mod.	60%
Jack Co.	8/6/12	10:30-11:30	0-5 mph/W	94°F	98°F	Loam/Low	44%
Hood Co.	8/2/12	9:30-11:00	5-9 mph/NW	93°F	94°F	N/A/Low	50%
Kent Co.	8/23/12	9:30-10:30	6-12 mph/SW	89°F	81°F	Sandy Loam/Low	55%
McCulloch Co.	8/24/12	9:45-11:15	2-8 mph/SE	82°F	91°F	Clay Loam/Low	55%

Table 2. Rates of application for Dow AgroSciences herbicides applied to mesquite foliar IPT trials established in 2010-2012. Methylated Seed Oil was added to all treatments at 1.0% v/v.

	Treatment No.	Herbicide	IPT Rate (volume/volume)
2010	1	Milestone	0.33%
		Reclaim	1.00%
	2	Milestone	0.37%
		Reclaim	1.10%
	3	Milestone	0.50%
		Reclaim	1.50%
	4	GF-2744	1.00%
	5	GF-2744	1.50%
	6	GF-2744	2.00%
	7	GF-2744	1.68%
	8	Remedy Ultra	0.50%
		Reclaim	0.50%
2011	1	Sendero	0.75%
	2	Sendero	1.50%
	3	Sendero	3.00%
	4	Sendero	1.50%
		Remedy Ultra	0.25%
	5	Sendero	1.50%
		Remedy Ultra	0.50%
	6	Reclaim	0.50%
		Remedy Ultra	0.50%
2012	1	Sendero	0.50%
	2	Sendero	0.75%
	3	Sendero	1.00%
	4	Reclaim	0.50%
		Remedy Ultra	0.50%

Results and Discussion

Final mortality evaluations have been completed on all sites installed in 2010 (Table 3). All treatments at the Erath Co. site performed relatively poorly, possibly due to application timing and plant conditions. The Erath Co. treatments were applied in late August, which is at the end of the application window and moderate insect damage to plant foliage was also noted during application. Across all sites, Milestone at 0.37% v/v plus Reclaim at 1.10% v/v had the highest average apparent mortality at 77% (Figure 1). The lower and higher rates of the Milestone + Reclaim tank mix also had high average apparent mortality at 58% and 69%, respectively. The current industry standard of Remedy Ultra + Reclaim at 0.5% + 0.5% v/v performed poorly at the 2 sites it was applied, averaging 33% apparent mortality. Based on the results from these 3 trials, it appears that the combination of aminopyralid and clopyralid is very effective when applied to mesquite as a foliar individual plant treatment.

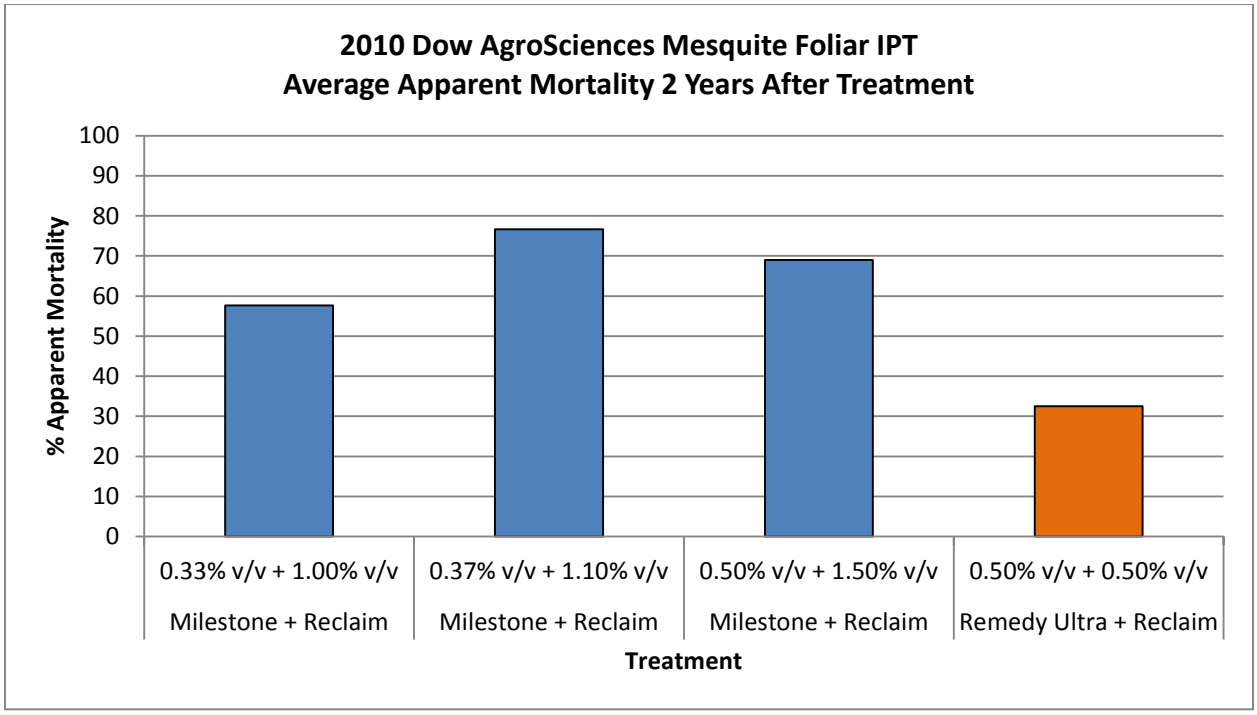

Figure 1. Average percent apparent mortality at 2 years after treatment for mesquite foliar IPT trials established in McClennan, Bell and Erath Counties in 2010.

Table 3. Rates of application and results for Dow AgroSciences mesquite foliar IPT trials established in 2010. Methylated Seed Oil was added to all treatments at 1.0% volume/volume.

			% Apparent Mortality	
Treatment No.	**Herbicide**	**Rate (volume/volume)**	**1YAT**	**2 YAT**
2010 McClennan Co.				
1	Milestone	0.33%	92	92
	Reclaim	1.00%		
2	Milestone	0.37%	89	94
	Reclaim	1.10%		
3	Milestone	0.50%	91	94
	Reclaim	1.50%		
4	GF-2744	1.00%	20	40
5	GF-2744	1.50%	50	23
6	GF-2744	2.00%	68	64
7	GF-2744	1.68%	61	26
8	Remedy Ultra	0.50%	67	44
	Reclaim	0.50%		
2010 Bell Co.				
1	Milestone	0.33%	64	64
	Reclaim	1.00%		
2	Milestone	0.37%	86	86
	Reclaim	1.10%		
3	Milestone	0.50%	87	89
	Reclaim	1.50%		
4	GF-2744	1.00%	66	63
5	GF-2744	1.50%	--	--
6	GF-2744	2.00%	70	77
7	GF-2744	1.68%	74	76
8	Remedy Ultra	0.50%	--	--
	Reclaim	0.50%		
2010 Erath Co.				
1	Milestone	0.33%	14	17
	Reclaim	1.00%		
2	Milestone	0.37%	50	50
	Reclaim	1.10%		
3	Milestone	0.50%	16	24
	Reclaim	1.50%		
4	GF-2744	1.00%	22	17
5	GF-2744	1.50%	23	23
6	GF-2744	2.00%	16	22
7	GF-2744	1.68%	8	12
8	Remedy Ultra	0.50%	21	21
	Reclaim	0.50%		

Initial results for trials established in 2011 are listed in Table 4. All treatments had very high initial apparent mortality at both the Ellis County and Stephens County sites. Sendero combined with Remedy Ultra had higher 1-year apparent mortality than Sendero alone at the Erath County site. Averaged across all sites, Sendero at 3.0% v/v had the highest initial apparent mortality (89%) and the industry standard Reclaim + Remedy Ultra at 0.5% + 0.5% v/v had the lowest at 65% (Figure 2).

Initial results of trials established in 2012 will be reported in 2013.

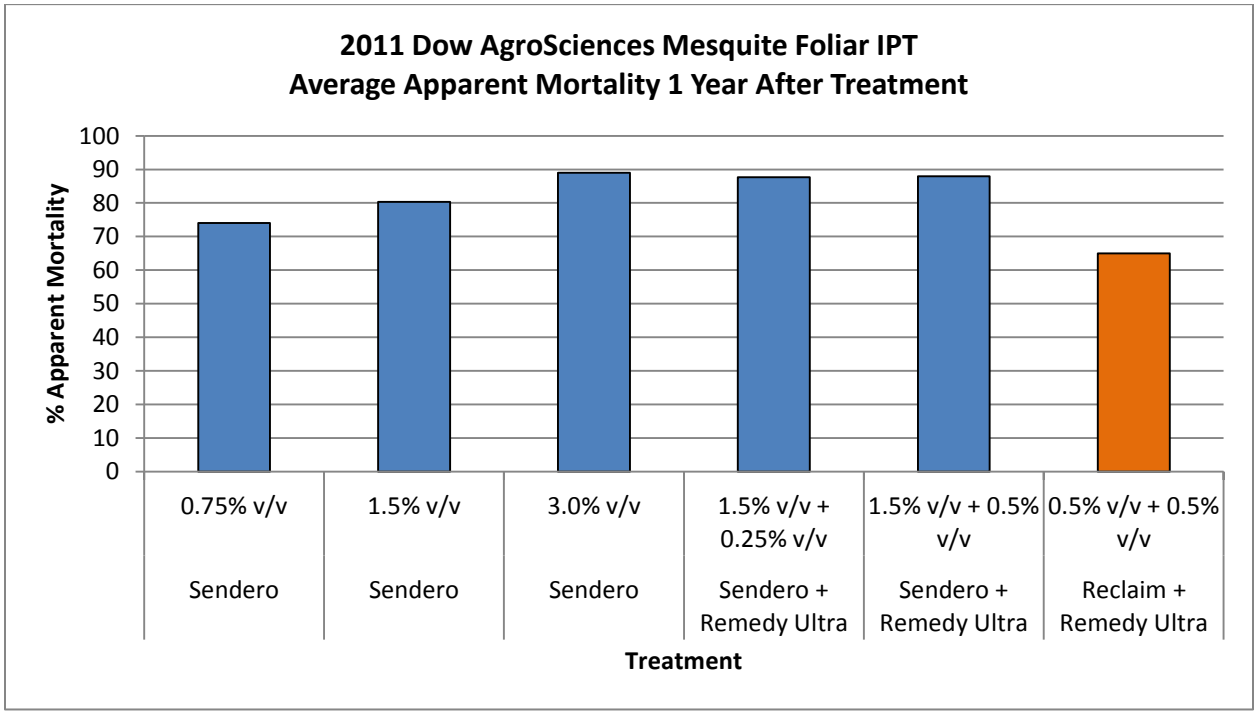

Figure 2. Average percent apparent mortality at 1 year after treatment for mesquite foliar IPT trials established in Ellis, Stephens and Erath Counties in 2011.

Table 4. Rates of application and results for Dow AgroSciences mesquite foliar IPT trials established in 2011. Methylated Seed Oil was added to all treatments at 1.0% volume/volume.

			% Apparent Mortality	
Treatment No.	**Herbicide**	**Rate (volume/volume)**	**1YAT**	**2 YAT**
2011 Ellis Co.				
1	Sendero	0.75%	86	
2	Sendero	1.50%	85	
3	Sendero	3.00%	100	
4	Sendero	1.50%	79	
	Remedy Ultra	0.25%		
5	Sendero	1.50%	85	
	Remedy Ultra	0.50%		
6	Reclaim	0.50%	88	
	Remedy Ultra	0.50%		
2011 Stephens Co.				
1	Sendero	0.75%	96	
2	Sendero	1.50%	97	
3	Sendero	3.00%	100	
4	Sendero	1.50%	97	
	Remedy Ultra	0.25%		
5	Sendero	1.50%	86	
	Remedy Ultra	0.50%		
6	Reclaim	0.50%	93	
	Remedy Ultra	0.50%		
2011 Erath Co.				
1	Sendero	0.75%	40	
2	Sendero	1.50%	59	
3	Sendero	3.00%	67	
4	Sendero	1.50%	87	
	Remedy Ultra	0.25%		
5	Sendero	1.50%	93	
	Remedy Ultra	0.50%		
6	Reclaim	0.50%	14	
	Remedy Ultra	0.50%		

Acknowledgements

This project was supported by Dow AgroSciences, McClennan, Bell, Erath, Stephens, Ellis, Callahan, Childress, Motley, Knox, Dickens, Burleson, Jack, Hood, Kent and McCulloch Counties and the cooperating landowners.