



Trends in Herbicide Use On Roadside Rights-of-Way in Oklahoma

Dennis L. Martin*, Douglas P. Montgomery, Craig C. Evans and Steve M. Batten

Horticulture & Landscape Architecture, Oklahoma State University, Stillwater, OK



Background

The Oklahoma Department of Transportation (ODOT) utilizes an integrated roadside vegetation management (IRVM) program consisting of selective mowing and herbicide use for roadside right of way management and weed control.

The Oklahoma State University roadside vegetation management program annually surveys ODOT field divisions concerning their weed management programs utilized in the safety zone immediately adjacent to the Interstate and state highway system in Oklahoma.

The survey gathers information pertaining to the identity of major targeted weeds, acreage treated, herbicides utilized, dates of application, weed control efficacy, new weed problems, applicator crew sizes, and use of non-traditional hours for herbicide application.



Figure 1. Roadside vegetation managers face many challenges including weed control and mowing requirements in roadside turf as well as weed invasion along cable cross-over protection barriers. Vegetation encroachment into the cracks and seams in concrete and asphalt pavement will eventually destroy the pavement over time if left unmanaged.

Survey results are used to assess current vegetation management program successes and challenges (Figure 1) as well as to formulate enhancements to future management programs, necessary research and continuing education (Figure 2) on RVM for ODOT employees.



Figure 2. Research tours conducted by the Oklahoma State University Roadside Vegetation Management program train Oklahoma Department of Transportation personnel on new herbicide management programs for weeds in roadside rights of way.

Acknowledgements

We gratefully acknowledge support from the Oklahoma Department of Transportation and the Oklahoma Agricultural Experiment Station for their financial support of this on-going research effort.

Materials and Methods

A 23 question survey was sent by email to approximately 83 ODOT field maintenance facilities organized into 8 field Divisions around Oklahoma during 2002 - 2011.

The 23 question survey gathers information pertaining to the identity of major targeted weeds, acreage treated, herbicides utilized, dates of application, weed control efficacy, new weed problems, applicator crew sizes, and use of non-traditional hours for herbicide application.

Surveys are sent to ODOT in late winter of each year and completed survey forms are returned by US Mail to the OSU program by ODOT in September of each year.

An Annual Herbicide Program Report covering roadside vegetation management is compiled by our team for ODOT each year.

This poster focuses only on major trends in herbicide use and acreage treated during the period 2002 – 2011.

Results

Total ODOT managed acres treated for weeds during the period 2002 to 2011 averaged 92,955 acres per year, ranging from a low of 53,074 acres in 2006 to a high of 122,217 acres in 2007 (Table 1).

In 2007 total acres treated for weeds increased by 31.5% over the 10 year average. This was due in part to higher rainfall that lead to increased weed pressure as well as an effort to increase the visual appeal of rights of way during the 2007 Oklahoma Statehood Centennial year.

Widespread drought during 2006 and 2011 lead to a reduction of 43% and 5.5% respectively, from the long term mean in total acres treated for weeds.

In 2011 only 87,806 acres were treated for weeds by ODOT, representing a 20.4% reduction from 2010 acreage treated (110,360 acres).

In 2011 69% of ODOT maintenance superintendents utilized weekends and evenings to complete herbicide applications (data not shown). Use of non-traditional work hours increases the ability to utilize periods of lower wind speeds, reduced traffic loads, increased motorist visibility of herbicide application trucks bearing strobe lights at night and increased visibility of spray patterns illuminated with spot lights at night.

Atrazine use under a 24c (Special Local Needs Label) was phased out of use by ODOT on Oklahoma roadsides prior to the loss of the special label, with the last use on Oklahoma roadsides being 2005. Glyphosate + 2,4-D replaced atrazine for winter weed control in 2006 and subsequent years.

Reduced use of MSMA for johnsongrass control was apparent in 2010 and 2011 following announcement of the 2009 Organic Arsenical Phase out Plan for MSMA use on roadsides.

Conclusions

Yearly surveying of the ODOT roadside vegetation management program furnishes results useful in tracking trends in the surveyed parameters.

Nine meetings with ODOT Divisional Pesticide Applicators are held each year to discuss weed control treatments, successes and failures from the previous season.

An Annual Herbicide Program Survey is submitted to ODOT each year by 31 December to allow for planning for the upcoming growing season.

The Annual Survey is useful in formulating both research and educational program for ODOT during the next year.

Fourteen annual pesticide applicator continuing education workshops are conducted in February through March each year serving over 700 ODOT service personnel concerning roadside vegetation management and weed management trends from the previous year gained in part through the Annual Survey.

Table 1. Comparison of herbicide acreages treated across several years for major herbicide treatment combinations (weed targets). Some treatments are not show, but acreage totals within years are the entire acreages treated for weeds by ODOT each year.

Major Herbicide Treatments and Target Weeds in Bermudagrass Roadsides									
Year	atrazine (winter annual weed control)	glyphosate +/- 2,4-D +/- AMS (winter annual weed control)	glyphosate +/- 2,4-D +/- aminopyralid +/- AMS (winter annual weed control)	glyphosate +/- sulfometuron (johnsongrass control)	glyphosate + sulfometuron + metsulfuron- methyl (Johnsongrass and broadleaf control)	glyphosate + sulfosulfuron (johnsongrass control)	glyphosate + Imazapic +/- 2,4-D (johnsongrass control)	MSMA +/- sulfometuron/ sulfosulfuron (johnsongrass control)	Total Acres Treated with Selected Herbicide Applications
2002	12,721	32,737	0	20,710	0	10,019	0	8,342	86,837
2003	11,857	32,381	0	24,040	0	11,485	0	6,109	89,729
2004	9,121	37,450	0	12,997	0	8,420	100	5,451	66,218
2005	6,788	42,403	0	28,986	0	7,851	1,053	11,220	91,768
2006	0	8,752	0	27,971	0	8,275	80	6,798	53,074
2007	0	29,478	34,532	13,870	0	30,906	0	12,708	122,217
2008	0	34,129	18,874	19,789	0	14,641	0	7,819	95,252
2009	0	32,483	21,033	28,998	0	12,609	7,506	7,751	110,380
2010	0	31,002	23,174	25,552	3,357	16,031	2,894	6,276	110,360
2011	0	34,204	32,417	6,414	6,816	5,859	450	1,647	87,806