IMPLEMENTATION OF PESTICIDE APPLICATOR CERTIFICATION SCHOOLS AND CONTINUING EDUCATION WORKSHOPS

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16. ABSTRACT

The Oklahoma Department of Transportation's (ODOT) herbicide applicator training program consists of initial pesticide applicator training schools followed by independent Certification testing and then on-going yearly continuing education workshops. In support of this on-going effort three pesticide applicator initial certification schools were conducted by Oklahoma State University (OSU) extension staff in fall of 2012 to train a total of 128 ODOT participants. All of the attendees at these workshops took the Core as well as Right of Way Certification exams administered by the Oklahoma Department of Agriculture, Food & Forestry (ODAFF). Seventy-nine percent (101 participants) passed both the Core and Category 6 (Right-of-Way) examinations to become Oklahoma Certified Pesticide Applicators. Fourteen Pesticide Applicator Continuing Education (CEU) Workshops were conducted by OSU extension staff across a total of eight ODOT Field Divisions in 2013 to provide 640 Certified Applicators with continuing education training. Records of participation in ODAFF approved CEU programs by ODOT personnel were furnished to ODAFF as well as the ODOT Field Divisions, the Maintenance Division Headquarters and the Planning and Research Division. Participation in CEU workshops resulted in granting of CEU credit to ODOT participants in the workshops. The ODOT participants also gained knowledge on various Integrated Pest Management (IPM) and Integrated Vegetation Management (IVM) products, topics and techniques. This increase or maintained operational knowledge of the participants should insure continued effective vegetation management skills.

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SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS				
SYMBOL	**WHEN YOU KNOW**	**MULTIPLY BY**	**TO FIND**	**SYMBOL**
LENGTH				
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
AREA				
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yard	0.836	square meters	m^2
A	acres	0.405	hectares	ha
mi^2	square miles	2.59	square kilometers	km^2
VOLUME				
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
NOTE: volumes greater than 1000 L shall be shown in m^3				
MASS				
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
TEMPERATURE (exact degrees)				
^oF	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	^oC
ILLUMINATION				
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	$candela/m^2$	cd/m^2
FORCE and PRESSURE or STRESS				
lbf	poundforce	4.45	newtons	N
lbf/in^2	poundforce per square inch	6.89	kilopascals	kPa

APPROXIMATE CONVERSIONS FROM SI UNITS				
SYMBOL	**WHEN YOU KNOW**	**MULTIPLY BY**	**TO FIND**	**SYMBOL**
LENGTH				
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
AREA				
mm^2	square millimeters	0.0016	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.195	square yards	yd^2
ha	hectares	2.47	acres	A
km^2	square kilometers	0.386	square miles	mi^2
VOLUME				
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m^3	cubic meters	35.314	cubic feet	ft^3
m^3	cubic meters	1.307	cubic yards	yd^3
MASS				
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
TEMPERATURE (exact degrees)				
^oC	Celsius	1.8C+32	Fahrenheit	^oF
ILLUMINATION				
lx	lux	0.0929	foot-candles	fc
cd/m^2	candela/m^2	0.2919	foot-Lamberts	fl
FORCE and PRESSURE or STRESS				
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in^2

*SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380.

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1.0 INTRODUCTION

The Oklahoma Department of Transportation (ODOT) uses an integrated roadside vegetation management (IRVM) program to provide cost-effective management for vegetation on roadside right-of-way (1). IRVM involves proper vegetation selection, installation and post-installation management. Generally post-installation vegetation management involves selective mowing and weed control (1). The ability to properly select and apply herbicides for right-of-way weed control is a technical skill that is not traditionally taught in primary or secondary school. This specialized training is not otherwise available to ODOT through any current in-house training, nor through the normal non-contractual services provided by the Oklahoma Cooperative Extension Service.

Each year there is some turnover in ODOT roadside vegetation management field staff which necessitates an on-going pesticide applicator training and certification effort for new employees. Also, the vegetation management arena is ever changing. This is due to changes in state and federal rules/regulations, new herbicide product development, new pesticide application equipment, product patent expiration and subsequent generic product offerings, changes in industry product marketing agreements, changes in products being awarded the state competitive bid contract, and lastly, ever emerging and evolving weed problems. This fluidity in the vegetation management profession necessitates an on-going education effort to ODOT herbicide applicators.

The every changing vegetation management scene led the ODOT Director in 1995 to develop ODOT Herbicide Program Policy Directive D-504-1 (2). The Directive amongst several requirements, states that all personnel applying herbicides must be Certified Pesticide Applicators under the requirements administered by the Oklahoma Department of Agriculture, Food and Forestry (ODAFF). The Directive (2) also requires anyone involved in the herbicide application to attend an annual training program pertinent to vegetation management.

2.0 OBJECTIVES

1. To conduct yearly herbicide applicator certification schools that will help prepare new ODOT personnel for subsequent pesticide applicator testing and certification.
2. To provide each of the eight ODOT Field Divisions with yearly herbicide applicator continuing education (CEU) workshops.

3.0 BACKGROUND AND SIGNIFICANCE OF WORK

For the past 27 years, annual pesticide applicator certification schools have been conducted on an “as-needed” basis as a part of the joint roadside vegetation management and training projects between ODOT and Oklahoma State University (OSU). These schools provide timely initial training of ODOT personnel attempting to become Oklahoma Certified Pesticide Applicators.

Under Task 1 in our FY2013 Joint Project Proposal covering *Roadside Vegetation Management Training and Consultation,* we proposed to continue to offer these schools which help prepare ODOT personnel for the rigors of two 100 question exams that must be passed for ODOT personnel to become certified in Oklahoma Category 6 (Right-of-Way). Certification in Category 6 (Right-of-Way) qualifies the applicator for use of pesticides for public road maintenance, power line maintenance, railroad right-of-way, storage tank areas, and other similar areas (3). Certification in Category 5 (Aquatic) qualifies the applicator for treatment of weeds in standing or running water in man-made and/or natural impoundments, streams, etc. (3). Category 6 certification excludes public health activities (e.g. mosquito control) and water in totally closed systems.

ODOT Field Divisions have hosted yearly CEU workshops in Category 6 (Right-of-Way) for the last 27 years. We proposed and were contracted to conduct these continuing education (CEU) workshops under Task 1 in our FY2013 Joint Project Proposal covering *Roadside Vegetation Management Training and Consultation.* These workshops have annually supplied current and vital information to approximately 650 Certified Applicators in ODOT each year. There will continue to be a need for some applicators to also obtain training in Oklahoma Category 5 (Aquatic Pest Control). This is due to the fact that some applicators need to treat aquatic sites located on lands managed by ODOT.

4.0 PURPOSE

The purpose of the Pesticide Applicator Certification schools was to train participants to understand the basics of integrated pest management (IPM) as well as to become Certified Applicators by passing the designated tests. After gaining a fundamental understanding of IPM and becoming a Certified Applicator, the individual is usually ready to be given specific assignments by in-house ODOT mentors. Trainees are prepared to be successful at managing weeds on Oklahoma roadsides. The initial Pesticide Applicator Certification prepares the new Certified Applicators for participation in annual pesticide applicator continuing education (CEU Workshops) so that they can comply with ODOT policy as well as maintain their certification in Oklahoma. Also, the initial training prepares the new applicator for training in the herbicide application equipment calibration workshops offered by the OSU RVM program under Task 4 of the Project 2156 proposal.

5.0 IMPLEMENTATION OF PESTICIDE APPLICATOR CERTIFICATION SCHOOLS AND TESTING

5.1 PREPARATIONS FOR FEDERAL FY2013 CERTIFIED APPLICATOR SCHOOLS

Division and Maintenance Engineers were contacted by phone and email in spring through fall of 2012 to estimate i) the number of participants for fall 2012 certification schools as well as ii) determine suitability of propose specific training dates and locations of training. At the same time, ODAFF was contacted to determine the availability of personnel to administer the Oklahoma Certified Pesticide Applicator core and category specific exams. Upon obtaining this information from all parties, the dates, times and locations of the three certification schools were set and the necessary information was provided in emails sent in August and September 2012 to ODOT Division and Maintenance Engineers and ODAFF.

Additionally, in those emails the Division and Maintenance leaders were asked to secure the three training documents for their participants using the order form for Pesticide Applicator Certification Manuals from Oklahoma State University Central Mailing Services via the internet at: http://pested.okstate.edu/order.pdf. The specific training materials to be acquired by the Divisions for their personal were i) *Applying Pesticides Correctly* (Revised 2012), ii) the Category 6: *Right-of-Way Study Guide* (Revised 2009) and iii) the *Oklahoma Pesticide Laws & Rules* (Revised 2008).

5.2 PESTICIDE APPLICATOR CERTIFICATION SCHOOLS

Three (3) Pesticide Applicator Certification Schools were presented to Oklahoma Department of Transportation (ODOT) employees in 2012 (Fed FY2013). The Fed FY 2013 certification schools were conducted on October 2-4 at ODOT Division 4 Headquarters (Perry), November 6-8 at ODOT Division 7 Headquarters (Duncan) and December 11-13 at ODOT Division 1 Headquarters (Muskogee). Fifty-three, twenty-one and fifty-four ODOT employees [128 total] participated in the three schools, respectively, compared to a total of 51 and 66 ODOT participants in Fed FY2011 (4) and Fed FY2012, respectively (4).

The first and second day of each of the three schools were conducted from 8:45 a.m. to 3:30 p.m. The schools were held using a classroom-style set up. Presentation of information was via an oral lecture using Smart Board peripheral display technology, Microsoft Power Point visual aids, and printed handouts were also provided. Participants were encouraged to ask questions during the lecture. A question and answer segment was provided immediately following each topic lecture. Our instructors for the schools were Extension Associate Mr. Douglas Montgomery, M.S. and Turfgrass Specialist Dennis Martin, PhD for the first school and Mr. Montgomery for the second and third schools.

5.3 SPECIFIC TOPICS OF PESTICIDE APPLICATOR CERTIFICATION SCHOOLS

Topics included in each of the three ODOT Certified Applicator Schools were: integrated pest management (IPM), IPM terminology, state and federal rules and regulations, pest identification, mechanical and cultural pest management strategies, understanding pesticide labels and material safety data sheets (MSDS), personal protective equipment (PPE), pesticide selection, pesticide application techniques, spray system technologies, environmental protection, application recordkeeping, proper pesticide storage and disposal and how to obtain pesticide applicator continuing education. These topics were drawn from the three key training manuals that Division and/or Maintenance Engineers had acquired for their employees in advance of the training. The training included and was consistent with the presentation of information in the i) *Applying Pesticides Correctly* (Revised 2012), ii) the Category 6: *Right-of-Way Study Guide* (Revised 2009) and iii) the *Oklahoma Pesticide Laws & Rules* (Revised 2008). OSU personnel also handed out copies of supplemental information that would be useful to ODOT personnel as they assumed their roll in ODOT vegetation management activities following initial certification as Oklahoma Pesticide Applicators.

5.4 APPLICATOR TESTING AND ACHIEVEMENT OF CERTIFICATION

On the third day of each of three FY2012 schools, pesticide applicator testing was conducted from 9:00 a.m. - 12:00 p.m. by representatives of the Oklahoma Department of Agriculture, Food and Forestry (ODAFF). ODOT personnel first took the core exam; a 100 question multiple choice written exam. ODAFF representatives then scored the participants core exam. Personnel that passed the core exam were next allowed to take the 100 question multiple choice written category specific exam. The category specific exam of most interest to ODOT was the Category 6 (Right-of-Way) exam although in some years there are ODOT personnel that also take the Category 5 (Aquatic Weed Control) exam.

Passing the core exam and category specific exam was required in order to become a Certified Pesticide Applicator in Oklahoma. Of the 128 participants in the three certification schools, 128 people tested for certification and 101 passed both the core and Category 6 (Right-of-Way) exam to become Oklahoma Certified Pesticide Applicators in Category 6. Thus, the FY2013 ODOT Certified Applicator School participants had an overall 79% pass rate in taking the certification exams compared with an overall pass rate of 86% for participants in FY2011 (4) and 93% in FY2012 (5).

5.5 POST-TESTING NOTICE OF CERTIFICATION OF PERSONNEL

Following the testing of ODOT employees, ODAFF provided the test scores and notification of achievement of certification in the Right-of-Way category to OSU RVM program Extension Associate Mr. Doug Montgomery. Mr. Montgomery then sent the information on these 128 individuals to their respective ODOT Division Headquarters, to the ODOT Maintenance Division headquarters in Oklahoma City and to the ODOT Planning and Research Division.

5.6 POST-TESTING RECORDKEEPING AT OKLAHOMA STATE UNIVERSITY

Upon receiving the results of testing and certification from ODAFF for ODOT participants at the three certification schools, Ms. Stephanie Larimer, Senior Secretary, and Mr. Doug Montgomery, Extension Associate in our program, entered the applicator names, ODOT employee number, employee Certified Applicator number, Division of employment, date of testing, testing score and categories of certification into our certified pesticide applicator database. This database is maintained under the Task 2 Objective: *Maintain Pesticide Applicator Training Records for ODOT Certified Pesticide Applicators*, as a part of the Joint Project 2156: *Roadside Vegetation Management Training & Consultation*. Several times per year, ODOT administrative personnel request verification of applicator certification status and the number of CEUs earned by applicators participating in past OSU CEU programs.

6.0 IMPLEMENTATION OF PESTICIDE APPLICATOR CONTINUING EDUCATION (CEU) WORKSHOPS

6.1 PESTICIDE APPLICATOR CONTINUING EDUCATION WORKSHOPS

Fourteen Pesticide Applicator Continuing Education (CEU) Workshops were conducted in FY2013. The locations, dates and attendance at each of the workshops are shown in Table 1. The workshops were approved by ODAFF as program OK-13-009 and awarded up to four pesticide applicator continuing education units (CEUs) in Category 6

(Right-of-way) as well as up to one CEU in Category 5 (Aquatic). The training agenda for the CEU programs is shown in Table 2. Our instructors for the CEU Workshops were Extension Associate Mr. Douglas Montgomery, M.S., then Extension Assistant, now Extension Associate Mr. Clayton Hurst, B.S. and Turfgrass Specialist Dennis Martin, PhD.

Participant numbers were high enough that two workshops were required in each Division with the exception of Division 2 and 6, in which only a single workshop was offered. A total of 640 Certified Pesticide Applicators were trained in the FY2013 CEU workshops as compared to a total of 605 individuals in FY2011 (4) and 610 in FY2012 (5). This represents a 4.9% increase in attendance from 2012. It is believed that some of this increase is in response to ODOT's efforts to fill employee positions vacated in FY2012. Loss of work force may be a result of retirements and migration of trained ODOT employees into other construction or maintenance type occupations.

6.2 CEU AWARDING AND POST WORKSHOP RECORDKEEPING

Attendance records of participants in the ODAFF approved CEU programs were supplied to ODAFF so that attendees could be awarded CEUs by ODAFF. Attendance records were also supplied to ODOT Division and Maintenance Engineers, the Maintenance Division Headquarters and the Planning and Research Division. Our records of attendance maintained under Task 2 of Joint Project 2156 were updated to reflect the participation of the 640 applicators in the 2013 CEU workshops.

7.0 SUMMARY AND CONCLUSIONS

Three pesticide applicator certification schools were conducted in fall of 2012 to train a total of 128 participants. All of the attendees at these workshops took the ODAFF administered certification exams. Of these 128 people, 101 participants passed both the Core and Category 6 (Right-of-Way) exam to become Oklahoma Certified Pesticide Applicators in Category 6 (a 79% percent pass rate). Division and Maintenance Engineers as well as ODOT Maintenance Division Headquarters and the State Planning and Research Division were furnished with applicator contact information and certification status/information. Certified applicator information was used to update the pesticide applicator records maintained by OSU for ODOT.

Fourteen Pesticide Applicator Continuing Education (CEU) Workshops were conducted across a total of 8 ODOT Field Divisions in the months of February, March and June of 2013. Two of the original workshops scheduled for February were moved to June due to poor weather conditions. A total of 640 Certified Applicators received continuing education training. Records of participation in ODAFF approved CEU programs by ODOT personnel were furnished to ODAFF as well as the ODOT Field Divisions, the Maintenance Division Headquarters and the Planning and Research Division. Participation in CEU workshops resulted in granting of CEUs to ODOT participants in the workshops. ODOT participants also gained knowledge on various Integrated Pest Management and Integrated Vegetation Management products, topics and techniques. This increase or maintained operational knowledge of attendees and should insure continued effective vegetation management skills. This training is believed to be essential in delivery of cost-effective vegetation management on Oklahoma roadsides.

As of the close of March 2013, the OSU-RVM program maintained records of pesticide applicator certification status and educational session participation for 966 ODOT Certified Pesticide Applicators. These records will be carried forward into Federal FY2014 under the terms of the current Joint 2156 ODOT/OSU Project.

Table 1. 2013 ODOT Herbicide Applicator Continuing Education (CEU) Workshop Schedule and Attendance.

CEU Workshop Dates	Day of Week	ODOT Division	Location	Attendance by Division
February 13	Wednesday	Div. 4	Perry HQ	Div. 4 - 78
June 19	Wednesday	Div. 4	Perry HQ	
February 19	Tuesday	Div. 3	Ada	Div. 3 - 83
June 11	Tuesday	Div. 3	Ada HQ	
February 21	Thursday	Div. 2	Antlers HQ	Div. 2 - 55
February 27	Wednesday	Div. 7	Duncan HQ	Div. 7 - 93
February 28	Thursday	Div. 7	Duncan HQ	
March 12	Tuesday	Div. 5	Clinton HQ	Div. 5 - 107
March 13	Wednesday	Div. 5	Clinton HQ	
March 14	Thursday	Div. 6	Woodward – High Plains Technology Center HQ	Div. 6 - 39
March 20	Wednesday	Div. 1	Muskogee HQ	Div. 1 - 94
March 21	Thursday	Div. 1	Muskogee HQ	
March 27	Wednesday	Div. 8	Tulsa HQ	Div. 8 - 83
March 28	Thursday	Div. 8	Tulsa HQ	
			Total[1]	640

[1] Total attendance represents the total number of ODOT employees who attended that were also Certified Oklahoma Pesticide Applicators.

Table 2. Agenda for the 2013 27th Annual Oklahoma Department of Transportation Herbicide Applicator Continuing Education Workshops.

Time	Topic	Presenter
8:45-9:00	**Registration**	
9:00-9:45	**1. Weighing and Measuring Herbicides Accurately / Doug Montgomery.** This presentation will discuss the differences in handling and measuring liquid and dry forms of herbicides. It will discuss common mistakes and errors that lead to inaccurate measuring and the potential problems associated with inaccurate measuring of herbicides.	
9:45-10:30	**2. Personal Protective Equipment and Herbicides / Dennis Martin or Clayton Hurst.** This presentation will discuss the basic function and use of Personal Protective Equipment (PPE) used in ODOT herbicide programs. The PPE requirements and responsibilities from both labels and worker protections standards and proper care and maintenance of PPE materials will be addressed.	
10:30-10:45	**Break**	
10:45-11:15	**3. Perspective® Herbicide Use Recommendations (new E-958) / Doug Montgomery.** This presentation will discuss selective weed control recommendations for ODOT use of the new herbicide Perspective®. Rate, timing of application, tank mix combinations, special considerations, and spectrum of weed control will be discussed along with specific environmental and safety precautions. The new OSU publication E-958 will be distributed.	
11:15-11:30	**4. Updates on MSMA Roadside Use / Dennis Martin or Clayton Hurst.** This presentation will be an update of the recent and current regulatory status of MSMA herbicide and its future use as an ODOT roadside weed control product. Recent 2012 EPA decisions will be discussed that address additional reviews to reinvestigate the reregistration status of MSMA and its regulatory status.	
11:30-11:45	**5. Updates on the Endangered Species Act and ODOT Herbicide Programs / Doug Montgomery.** This presentation will discuss ODOT responsibilities with regards to Endangered Species Act compliance and their use of herbicides. Attention will be given to herbicide label information, compliance documentation, and how it affects today's specific ODOT herbicide use.	
11:45-12:45	**Lunch**	
12:45-1:00	**6. Introduction to the new OSU RVM Website / Doug Montgomery.** This presentation will introduce ODOT personnel to the new OSU Roadside Vegetation Management website. This presentation will discuss how to access this site and the types of information available on the new site. The new website will provide ODOT applicators with easy access to OSU Roadside Weed Control Research Reports, Herbicide Compatibility Reports, Herbicide Equipment Reports, Recordkeeping Forms, Herbicide Complaint Forms, Noxious Weed Complaint forms, along with additional links and information.	

Continued on next page

Table 2. (Continued from previous page) Agenda for the 2013 27th Annual Oklahoma Department of Transportation Herbicide Applicator Continuing Education Workshops.

Time	Topic	Presenter

1:00-1:30 7. Today's Johnsongrass Control Options / Dennis Martin or Clayton Hurst. This presentation will discuss today's johnsongrass control options that are available to ODOT along with OSU recommendations. Rate, timing of application, use precautions, spectrum of weed control, and comparative costs will be discussed.

1:30-1:45 Break

1:45-2:15 8. Broadleaf Weed Identification and Control Options / Doug Montgomery. This presentation will discuss the key identification characteristics of the most troublesome broadleaf weed species along Oklahoma roadsides. Life cycle, herbicide control options, use precautions, and special adjuvant requirements will be addressed.

2:15-2:45 9. Controlling Weeds with Wiper Applications (w/Grass Works-Weed Wiper Video ~10 minutes) / Dennis Martin or Clayton Hurst. This presentation will discuss the use of wiper-type applicators for controlling roadside weeds with special attention to switchgrass. Herbicide ratios along with timing of wiper applications will be discussed along with how to implement these treatments into an existing mowing program. A short video from Grass Works, Inc., manufacturer of the Weed Wiper (commercial brand of wiper applicator), will be used to support this oral presentation.

2:45-2:50 Final comments/Adjourn

8.0 REFERENCES

1. Montgomery, D.P., D.L. Martin and C.C. Evans. 2009. Section 1.0 Introduction. Roadside Vegetation Management Guidelines. 4th Edition. Oklahoma State University. Dept. of Horticulture & Landscape Architecture. 258 Pages.

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5. Martin, D.L., C.C. Evans and D.P. Montgomery. 2013. Implementation of Pesticide Applicator Certification Schools and Continuing Education Workshops. Annual Report For Federal FY2012 For ODOT SPR Item Number 2156. Dept. of Horticulture & Landscape Architecture. Oklahoma State University. 9 pages.