

IMPLEMENTATION OF PESTICIDE APPLICATOR CERTIFICATION SCHOOLS AND CONTINUING EDUCATION WORKSHOPS

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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				
in²	square inches	645.2	square millimeters	mm ²
ft²	square feet	0.093	square meters	m ²
yd²	square yard	0.836	square meters	m ²
A	acres	0.405	hectares	ha
mi²	square miles	2.59	square kilometers	km ²
VOLUME				
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft³	cubic feet	0.028	cubic meters	m ³
yd³	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)				
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C
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/in²	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				
mm²	square millimeters	0.0016	square inches	in ²
m²	square meters	10.764	square feet	ft ²
m²	square meters	1.195	square yards	yd ²
ha	hectares	2.47	acres	A
km²	square kilometers	0.386	square miles	mi ²
VOLUME				
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m³	cubic meters	35.314	cubic feet	ft ³
m³	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)				
°C	Celsius	1.8C+32	Fahrenheit	°F
ILLUMINATION				
lx	lux	0.0929	foot-candles	fc
cd/m²	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 who will be applying herbicides must be Certified Pesticide Applicators under the requirements administered by the Oklahoma Dept. 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 & certification and
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 25 years, annual pesticide applicator Certification schools have been conducted on an “as-needed” basis as a part of the joint roadside vegetation management & training projects between ODOT and the Oklahoma State University (OSU). These schools provide timely initial training of ODOT personnel who will be attempting to become Oklahoma Certified Pesticide Applicators.

Under Task 1 in our FY2011 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 qualify 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 24 years. We proposed and were contracted to conduct these continuing education (CEU) workshops under Task 1 in our FY2011 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 ditch areas that contain either seasonal or permanent standing water and/or stream banks that adjoin rights-of-way.

4.0 PURPOSE

The purpose of the Pesticide Applicator Certification schools are to train participants to understand the fundamentals of integrated pest management (IPM) and to pass Oklahoma Certified Applicator testing requirements so as to become Certified Applicators. 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 FY2011 CERTIFIED APPLICATOR SCHOOLS

Division and Maintenance Engineers were contacted by phone and email in spring and summer of 2010 to estimate i) the number of participants for fall 2010 Certification schools as well as ii) determine suitability of propose specific training dates and locations of training. At the same time, the 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 a August 25, 2011 memo sent by email to ODOT Division and Maintenance Engineers and ODAFF. Additionally, in that email 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> (verified 7 March 2012). The specific training materials to be acquired by the Divisions for their personal were i) *Applying Pesticides Correctly* (Revised 2008), 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 2010 (Fed FY2011). The Fed FY 2011 certification schools were conducted on October 12 – 14, at Meridian Technology Center, Stillwater, November 2 – 4, Kiamichi Technology Center, McAlester and December 7 – 9, Red River Technology Center, Duncan. The schools were presented at these locations due to conflicting ODOT training at respective divisional headquarters at Divisions 2, 4 and 7. Eight (8), twenty two (22) and twenty one (21) ODOT employees [51 total] participated in the three schools, respectively, compared to 65 participants in Fed FY2010 (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 if information was not clear and a question and answer segment was provided immediately following each topic lecture. Our instructors for the schools were Extension Associates Mr. Craig Evans, M.S. and Mr. Douglas Montgomery, M.S.

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 record keeping, 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 2008), 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 & ACHIEVEMENT OF CERTIFICATION

On the third day of each of three FY2011 schools, pesticide applicator testing was conducted from 9:00 a.m. - 12:00 p.m. by representatives of the Oklahoma Department of Agriculture, Food & 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 51 participants in the three Certification Schools, 51 people tested for Certification and 44 passed both the core and Category 6 (Right of Way) exam to become Oklahoma Certified Pesticide Applicators in Category 6: Right-of-Way. Thus, the FY2011 ODOT Certified Applicator School participants had an overall 86% pass rate in taking the Certification exams.

5.5 POST-TESTING NOTICE OF CERTIFICATION OF PERSONNEL

Following the testing of ODOT employees, the ODAFF provided the test scores and notification of achievement of Certification in the ROW category to OSU RVM program Extension Associate Mr. Craig Evans. Mr. Evans then sent the information on these 51 individuals to their respective ODOT Division Headquarters, to the ODOT Maintenance Division headquarters in Oklahoma City and to the ODOT Planning & Research Division.

5.6 POST-TESTING RECORD KEEPING AT OKLAHOMA STATE UNIVERSITY

Upon receiving the results of testing and certification from ODAFF for ODOT participants at the three Certification schools, Mr. Craig Evans, 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 (14) Pesticide Applicator Continuing Education (CEU) Workshops were conducted in FY2011. The locations, dates and attendance at each of the workshops are shown in Table 1. The workshops were approved by the ODAFF as program OK-11-004 and awarded up to four (4) pesticide applicator continuing education units (CEUs) in Category 6 (Right-of-way) and Category 10 (Demonstration & Research) as well as up to one (1) CEU in Category 5 (Aquatic). The training agenda for the CEU programs is shown in Table 2.

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 605 Certified Pesticide Applicators were trained in the FY2011 CEU workshops as compared to 644 individuals in FY2010. This represents a decrease of 41 individuals or a 6% decrease in attendance from 2010. It is believed that some of this decrease is due to reduction in work force due to retirements and migration of trained ODOT employees into oil-field industry positions.

6.2 CEU AWARDING AND POST WORKSHOP RECORD KEEPING

Attendance records of participants in the ODAFF approved CEU programs were supplied to ODAFF so that attendees would be awarded CEUs by ODAFF. Attendance records were also supplied to ODOT Division and Maintenance Engineers, the Maintenance Division Headquarters and the Planning & Research Division. Our records of attendance maintained under Task 2 of Joint Project 2156 were updated to reflect the participation of the 605 applicators in the 2011 CEU workshops.

7.0 SUMMARY AND CONCLUSIONS

Three (3) pesticide applicator Certification schools were conducted in fall of 2010 to train a total of 51 participants. Fifty-one of the attendees at these workshops took the ODAFF administered Certification exams. Forty-four (44) participants passed both the Core and Category 6: Right-of-Way exam to become Oklahoma Certified Pesticide Applicators in Category 6 (an 86 percent pass rate). Division and Maintenance Engineers as well as ODOT Maintenance Division Headquarters and the State Planning & 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 (14) Pesticide Applicator Continuing Education (CEU) Workshops were conducted across 8 ODOT field Divisions in February and March of 2011. A total of 605 Certified Applicators received continuing education training. Records of participation in ODAFF approved CEU programs by ODOT personnel were furnished to the ODAFF as well as the ODOT field Divisions, the Maintenance Division Headquarters and the Planning & 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 Federal FY2011 the OSU-RVM program maintained records of pesticide applicator Certification status and educational session participation for 841 ODOT Certified Pesticide Applicators. These records were carried forward into Federal FY2012 under the terms of the current Joint 2156 ODOT/OSU Project.

Table 1. 2011 ODOT Herbicide Applicator Continuing Education (CEU) Workshop Schedule and Attendance.

CEU Workshop Dates	Day of Week	ODOT Division	Location	Attendance by Division
February 8	Tuesday	Div. 5	Clinton HQ	Div 5 - 104
February 9	Wednesday	Div. 5	Clinton HQ	
February 10	Thursday	Div. 6	Woodward – High Plains Technology Center	Div 6 - 33
February 22	Tuesday	Div. 1	Muskogee HQ	Div 1 - 92
February 23	Wednesday	Div. 1	Muskogee HQ	
March 1	Tuesday	Div. 3	Ada HQ	Div. 3 - 51
March 3	Thursday	Div. 2	Antlers HQ	Div 2 - 39
March 4	Friday	Div. 3	Ada HQ	Div. 3 - 29
March 8	Tuesday	Div. 8	Tulsa HQ	Div 8 - 85
March 9	Wednesday	Div. 8	Tulsa HQ	
March 22	Tuesday	Div. 4	Perry HQ	Div 4 - 82
March 23	Wednesday	Div. 4	Perry HQ	
March 29	Tuesday	Div. 7	Duncan HQ	Div 7 - 90
March 30	Wednesday	Div. 7	Duncan HQ	
Total ¹				605

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

Table 2. Agenda for the 2011 25th Annual Oklahoma Department of Transportation Herbicide Applicator Continuing Education Workshops.

Time	Topic	Presenter
8:45 – 9:00	Registration	
9:00 – 9:15	Opening Comments by ODOT & OSU	
9:15 – 9:55 (40 min)	Sprayer Calibration, How to Do It Right	Craig Evans, OSU
	Classroom exercise to properly calibrate large capacity, truck mounted herbicide sprayers and backpack sprayers. Backpack sprayers are used for aquatic weed control efforts will be covered.	
9:55 – 10:15 (20 min)	Invasive Plant Council Update	Doug Montgomery, OSU
	Update on the Oklahoma Invasive Plant Council (OkIPC) meeting agenda and topic discussions introduced at the 2010 OKIPC meeting in Oklahoma City, July 14th	
10:15 – 10:35	Break	
10:35 – 11:05 (30 min)	2011 ODOT Herbicide Survey Results and 2011 Recommendations	Craig Evans, OSU
	Results from the 2010 Herbicide Program Survey and new vegetation management recommendations.	
11:05 – 11:35 (30 min)	Pigweeds: The Plague of the Future?	Doug Montgomery, OSU
	ODOT vegetation managers have recognized the increase in pigweed infestation on roadsides. This program will train applicators about pigweeds species and their management in Oklahoma.	
11:35 – 12:35	Lunch	
12:35 – 1:05 (30 min)	Herbicide Resistance In Weed Species	Craig Evans, OSU
	Causes of herbicide resistance, the approaches to counteract development of herbicide resistance and what to do if weed species on Oklahoma rights-of-way exhibit herbicide resistance characteristics.	
1:05 – 1:35 (30 min)	Switchgrass Expansion on ODOT Rights-of-Way	Doug Montgomery, OSU
	The 2010 Herbicide Program Survey Results indicate that switchgrass is becoming a major clear zone weed species. ODOT applicators will learn ID & management strategies.	
1:35 – 1:55	Break	
1:55 – 2:10 (15 min)	ODAFF Websites Update	Craig Evans, OSU
	Update on the new ODAFF CEU Status Indicator and ODAFF Sensitive Crop Locator.	
2:10 – 2:40 (30 min)	Update on the Registration and Roadside Use of Pastora®, Streamline™ and Perspective™ Herbicides	Doug Montgomery, OSU
	Updates on three new herbicide products; their active ingredients, labeled use sites, application rates, weeds controlled, use in resistance management and use precautions.	
2:40 – 3:00 (20 min)	MSMA, Its Future with ODOT and ODOT's Contingency Plans	Craig Evans, OSU
	Updates from the October 28, 2010 webinar <i>the Future of MSMA Turf Uses; Meeting of Organic Arsenical Products Task Force with Turf Specialists and Weed Scientists</i> meeting. ODOT applicators and vegetation managers will be updated on issues and concern voiced during the meeting. ODOT applicators will also be trained regarding control options that will replace MSMA.	

8.0 REFERENCES

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4. Martin, D.L., C.C. Evans and D.P. Montgomery. 2010. Implementation of Pesticide Applicator Certification Schools and Continuing Education Workshops. Annual Report For Federal FY2010 For ODOT SPR Item Number 2156 Dept. of Horticulture & Land. Arch. OK State. Univ. 8 pages.