# IMPLEMENTATION OF PESTICIDE APPLICATOR CERTIFICATION SCHOOLS AND CONTINUING EDUCATION WORKSHOPS

## FINAL REPORT ~ FHWA-OK-14-18

ODOT SP&R ITEM NUMBER 2156 TASK 1

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December 11, 2014

## TECHNICAL REPORT DOCUMENTATION PAGE

| | | |
|---|---|---|
| 1. REPORT NO.<br>FHWA-OK-14-18 | 2. GOVERNMENT ACCESSION NO. | 3. RECIPIENT'S CATALOG NO. |
| 4. TITLE AND SUBTITLE<br>Implementation of Pesticide Applicator Certification Schools and Continuing Education Workshops | | 5. REPORT DATE<br>Dec 2014<br>6. PERFORMING ORGANIZATION CODE |
| 7. AUTHOR(S)<br>Dennis Martin, Ph.D., Professor<br>Clayton Hurst, B.S., Extension Associate | | 8. PERFORMING ORGANIZATION REPORT<br>7T |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>Oklahoma State University<br>Horticulture & Landscape Architecture Department<br>358 Agricultural Hall<br>Stillwater, OK 74078 | | 10. WORK UNIT NO.<br>11. CONTRACT OR GRANT NO.<br>ODOT SP&R Item Number 2156 |
| 12. SPONSORING AGENCY NAME AND ADDRESS<br>Oklahoma Department of Transportation<br>Materials and Research Division<br>200 N.E. 21st Street, Room 3A7<br>Oklahoma City, OK 73105 | | 13. TYPE OF REPORT AND PERIOD COVERED<br>Final Report<br>Oct 2013 - Sep 2014<br>14. SPONSORING AGENCY CODE |
| 15. SUPPLEMENTARY NOTES<br>7T | | |


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 2013 and mid-winter of 2014 to train a total of 103 ODOT participants. One hundred 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 (79 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 2014 to provide 637 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 Materials 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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| 17. KEY WORDS<br>Training, Herbicides, Weed Control, Vegetation Management, IPM, Integrated Pest Management, IVM, Integrated Vegetation Management | 18. DISTRIBUTION STATEMENT<br>No restrictions. This publication is available from the Materials & Research Div., Oklahoma DOT. | | |
| 19. SECURITY CLASSIF. (OF THIS REPORT)<br>Unclassified | 20. SECURITY CLASSIF. (OF THIS PAGE)<br>Unclassified | 21. NO. OF PAGES<br>17 | 22. PRICE<br>N/A |

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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<br>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). This effort involves proper vegetation selection, installation and post-installation management. After vegetation installment, management involves selective mowing and weed control (1) and occasional re-establishment on a limited basis. The ability to properly select and apply herbicides for right-of-way weed control is a technical skill that is not 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.

Because there is some turnover in ODOT roadside vegetation management field staff each year, an on-going pesticide applicator training and certification effort is necessary. 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, evolving weed problems. This fluidity in the vegetation management profession necessitates an on-going education effort to ODOT herbicide applicators.

In 1995 ODOT developed the Herbicide Program Policy Directive D-504-1 (2). The Directive includes requirements 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 herbicide application 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 28 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 FY2014 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 28 years. We proposed and were contracted to conduct these continuing education (CEU) workshops under Task 1 in our FY2014 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 FY2014 CERTIFIED APPLICATOR SCHOOLS

Division and Maintenance Engineers were contacted by phone and email in spring through fall of 2013 to estimate i) the number of participants for fall 2013 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 four certification schools were set and the necessary information was provided in emails sent in August and September 2013 to ODOT Division and Maintenance Engineers and ODAFF. Additionally, in those emails the Division and Maintenance leaders were asked to secure two 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 email also contained information explaining that the *Oklahoma Pesticide Laws & Rules* manual is no longer available for order and must now be downloaded and printed from the following website **(**http://www.oda.state.ok.us/forms/cps/cpl.pdf**)** or picked up at the ODAFF in Oklahoma City. 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

Four Pesticide Applicator Certification Schools were presented to Oklahoma Department of Transportation (ODOT) employees in 2013 and early 2014 (Fed FY2014). The Fed FY 2014 certification schools were conducted on November 19-21 at the Canadian Valley Technology Center (Chickasha), December 16-18 at ODOT Division 4 Headquarters (Perry), January 7-9 at ODOT Division 1 Headquarters (Muskogee) and the Kiamichi Technology Center (Atoka). Participants were 16, 22, 26, and 39 ODOT employees [103 total] in the four schools, respectively, compared to a total 128 ODOT participants in Fed FY2013 (6).

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. 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. Steve Batten, M.S. and Extension Associate Mr. Clayton Hurst, B.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 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 four FY2014 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 103 participants in the four certification schools, 100 people tested for certification and 79passed both the core and Category 6 (Right-of-Way) exam to become Oklahoma Certified Pesticide Applicators in Category 6. Thus, the FY2014 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) 93% in FY2012 (5) and 79% in FY2013 (6).

### 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. Clayton Hurst. Mr. Hurst then sent the information on these 100 individuals to their respective ODOT Division Headquarters, to the ODOT Maintenance Division headquarters in Oklahoma City and to the ODOT Materials 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. Clayton Hurst, 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 FY2014. The locations, dates and attendance at each of the workshops are shown in Table 1. The workshops were approved by ODAFF as program OK-14-005 and awarded up to four pesticide applicator continuing education units (CEUs) in Category 6 (Right-of-way) as well as up to three 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. Clayton Hurst, B.S., and Extension Associate, Mr. Steve Batten, M.S..

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 637 Certified Pesticide Applicators were trained in the FY2014 CEU workshops as compared to a total of 605 individuals in FY2011 (4), 610 in FY2012 (5) and 640 in FY2013 (6). This represents a 0.47% decrease in attendance from 2013.

### 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 Materials and Research Division. Our records of attendance maintained under Task 2 of Joint Project 2156 were updated to reflect the participation of the 637 applicators in the 2014 CEU workshops.

## 7.0 SUMMARY AND CONCLUSIONS

Four pesticide applicator certification schools were conducted from November of 2013 to January 2014 to train a total of 103 participants. One hundred of the attendees

at these workshops took the ODAFF administered certification exams. Of these 100 people, 79 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 Materials 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 one Workshop in April of 2014. Two of the original workshops scheduled for February were postponed due to winter weather conditions, one of the workshops took place in March and the other was conducted in early April. A total of 637 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 Materials 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 FY2014, the OSU-RVM program maintained records of pesticide applicator certification status and educational session participation for ODOT Certified Pesticide Applicators. These records will be carried forward into Federal FY2015 under the terms of the current Joint 2156 ODOT/OSU Project.

**Table 1. 2014 ODOT Herbicide Applicator Continuing Education (CEU) Workshop Schedule and Attendance.**

| CEU Workshop Dates | Day of Week | ODOT Division | Location | Attendance by Division |
|---|---|---|---|---|
| March 4 | Tuesday | Div. 7 | Duncan HQ | Div. 7- 83 |
| April 3 | Thursday | Div. 7 | Duncan HQ | |
| February 18 | Tuesday | Div. 1 | Muskogee HQ | Div. 1 - 88 |
| February 19 | Wednesday | Div. 1 | Muskogee HQ | |
| February 20 | Thursday | Div. 2 | Antlers HQ | Div. 2 - 73 |
| February 25 | Tuesday | Div. 4 | Perry HQ | Div. 4 - 80 |
| February 26 | Wednesday | Div. 4 | Perry HQ | |
| March 11 | Tuesday | Div. 5 | Clinton HQ | Div. 5 - 104 |
| March 12 | Wednesday | Div. 5 | Clinton HQ | |
| March 13 | Thursday | Div. 6 | Woodward – High Plains Technology Center | Div. 6 - 42 |
| March 18 | Thursday | Div. 3 | Ada HQ | Div. 3 - 87 |
| March 19 | Wednesday | Div. 3 | Ada HQ | |
| March 25 | Thursday | Div. 8 | Tulsa HQ | Div. 8 - 80 |
| March 26 | Wednesday | Div. 8 | Tulsa HQ | |
| | | | Total[1] | 637 |

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

**Table 2. Agenda for the 2014 - 28th Annual Oklahoma Department of Transportation Herbicide Applicator Continuing Education Workshops.**

| Time | Topic | Presenter |
|---|---|---|

**8:45-9:00 Registration**

**9:00-9:35 Broadleaf Weed Identification and Available Control Options / Steve Batten**
This presentation will discuss some of the more problematic broadleaf weed species encounter in road side areas. Plant descriptions will be discussed and different growth stages will be shown in an effort to help applicators improve his or her weed identification and herbicide application timing. Control measures will be explored including selecting chemical control options, proper application timing, and application techniques.

**9:35-10:15 Information Gathering Tools for a Successful Applicator /Clayton Hurst.**
This presentation will aim to improve an applicators ability to attain useful information related to herbicide use and IPM. Gathering information before making herbicide applications is an important part of a successful weed control program.

**10:15-10:30 Break**

**10:30-11:10 Grass Type Weed Identification and Available Control Option /Steve Batten**
This presentation will discuss some of the more problematic grassy weed species encounter in roadside areas. Plant descriptions will be discussed and different growth stages will be shown in an effort to help applicators improve weed identification and herbicide application timing. Control measures will be explored including selecting chemical control options, rates, use precautions, proper application timing, and application techniques.

**11:10-11:40 EsplAnade™ 200 SC Herbicide Use Recommendations / Clayton Hurst.**
This presentation will introduce EsplAnade™ 200 SC to the ODOT applicators as a new tool for weed control programs. Product use recommendations will be discussed including application rates, application timing, and effective tank mix combinations, illustrated with the findings of OSU-RVM research. Special considerations will be discussed regarding environmental and safety concerns.

**11:40-12:40 Lunch**

**12:40-1:40 Managing the Development of Herbicide Resistant Weeds /Clayton Hurst.**
This presentation will introduce and explain the concept of herbicide resistance. The importance of a dynamic weed control program and ideas on how to improve a program from an herbicide resistance perspective will be presented. Program improvement strategies like active ingredient rotation from season to season and or tank mix combinations using chemicals with different MOA groups will be discussed. Proper herbicide use along with Integrated Pest Management techniques will be stressed.

**1:40-1:55 Break**

**Continued on next page**

**Table 2. (Continued from previous page) Agenda for the 2014 - 28th Annual Oklahoma Department of Transportation Herbicide Applicator Continuing Education Workshops.**

| Time | Topic | Presenter |
|---|---|---|

**1:55-2:45 Proper Herbicide Mixing and Loading Techniques and Personal Protective Equipment/ Steve Batten.** The presentation will discuss proper handling of herbicides, from the mixing and loading process to application as well as the selection of proper personal protective equipment (PPE). Dry and liquid measurements, the use of scales and volumetric measuring devices will be covered.

**2:45-2:55 Final Comments/Adjourn**

## 8.0 REFERENCES

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