# 2003 Report on
# Roadside Vegetation Management
# Equipment & Technology

## Project 2156: Section 9

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## 1.0 Introduction

The objective of this report is to provide Oklahoma Department of Transportation (ODOT) personnel with recommendations concerning the implementation of new equipment or technologies that will benefit in the management of vegetation in the roadside right-of-way. The focus of this particular report is to encourage ODOT to implement promising computer technologies into their roadside vegetation management programs. During the remainder of the current Joint Project 2156 (Roadside Vegetation Management Training, Consultation and Development of Educational Resources) significant efforts will be made by OSU Roadside Vegetation Management (RVM) personnel to increase the use and effectiveness of computers with regards to the many vegetation issues ODOT personnel deal with each year. Personal computers are currently being underutilized as a tool in assisting ODOT vegetation managers in communications, data transfer, training activities, and in documentation of maintenance.

## 2.0 Herbicide Program Computer Support Technologies

Personal computers (PC) have become one of the most useful tools that roadside vegetation managers have available to make themselves more effective and efficient at managing roadside plants. Depending on an individual's computer skills and the quality of their computer set-up, the PC can also be one of the most frustrating tools. It is the current understanding of OSU RVM personnel that most if not all ODOT statewide maintenance personnel have immediate access to a PC. It is also the current understanding that ODOT routinely keeps these computers updated with the necessary hardware (memory, hard drives, floppy/CD drives, internet connectivity, etc). The ODOT currently uses its computers for more and more daily tasks and this is a trend that should continue. It is therefore logical that ODOT should try and use its computers to benefit its personnel operating in the area of roadside vegetation management.

### ODOT Personal Computers and Hardware

Personal communications with several of the field divisions and county facilities during the last three years has revealed that most of the current ODOT PCs are inadequate to fulfill the recommendations included in this report. Current ODOT computers need to have adequate hardware and software, internet connectivity and e-mail capability to conduct roadside vegetation management business. This capability needs to include but is not necessarily limited to the necessary processor speed/channel technology, graphics processing and display capability, hard drive (HD) space, media drives (floppy, compact disks [CD], digital video discs [DVD]s) and random access memory (RAM) to allow the necessary software packages to work effectively. Existing PCs also need to have working read-write CD drives while future purchases should have DVD-Read capability as some of the media used by the OSU-RVM program to supplement future education and communication efforts will be DVD technology. Rather than providing minimum suggested hardware specifications in terms of processor speed and memory, we simply recommend that new purchases or upgrades of existing hardware include the minimum components above, with specifications capable of handling the latest “recommended system

requirements" associated with the most demanding software that ODOT intendes to use (see Appendices A through D of this report).

**Electronic Communications (e-mail)**

Sending hard copy documents through the U.S. Mail still has its place, however, with the advent of electronic mail (e-mail) one can do in minutes what the US Mail took several days to perform. Currently OSU RVM personnel have frequent e-mail communications with both ODOT Field Division personnel and Division 9 Headquarters personnel. There is very limited use of e-mail communications between OSU RVM personnel and county/interstate maintenance personnel due to the inability of county personnel to use e-mail. The use of e-mail to communicate with the county level personnel would greatly enhance information flow with respect to timely vegetation management program reminders, upcoming training sessions, as well as in the transfer of training and certification data. Sending attached documents is also an efficient way of communicating program information; especially weed control treatment information. Sending an attached digital weed control recommendation as opposed to giving the same information over the phone would potentially help in clarity and accuracy of communications.

Our experience in working with ODOT field staff indicates that they are experiencing a few compatibility issues related to sending and receiving of attached documents to e-mail. While the ability of field personnel to view attached word processing documents (attachments in MS Word format) doesn't seem to be a problem, opening and viewing of graphics files, photographs, and spreadsheets have been at issue in the recent past. These issues should be addressed in order to improve communications and optimized benefits of digital information transfer technology. It should be mentioned that any e-mail correspondence to a county or interstate facility would also be copied to appropriate field division maintenance personnel by our staff.

**Software Requirements**

To take full advantage of the educational resources that the OSU RVM program is preparing to create under Joint Project 2156, ODOT field facilities will likely need to add select pieces of software to some of their PCs. Acrobat Reader (Version 6.0) is a free software package that could be easily installed on ODOT computers and would be used to view portable document format (PDF) documents. The Acrobat Reader software is available free of charge from web address: http://www.adobe.com/products/acrobat/acrrsystemreqs.html#60win. The recommended and minimum required system operating hardware and support software for Acrobat Reader software to function are also detailed at the website and are referenced in Appendix A of this document. System requirements of software will dictate the necessary computer hardware that is needed to implement the recommendations of this report.

Many of the future OSU annual reports and training materials will be available not only in hard copy but also in PDF format. ODOT computers will need the Acrobat Reader software to view and/or print additional copies of the documents. With Acrobat Reader software they will not be able to edit PDF documents. It is important to note that we do not deem it necessary for

ODOT to edit these types of documents, so "Reader" software is quite adequate. Acrobat Reader is also the software needed to read and/or download current herbicide labels and material safety data sheets from web sites such as CDMS on-line (Crop Data Management Systems, Naso-Hart Building, 423 Fourth Street, 7th Floor, Marysville, CA 95901) at web address www.cdms.net.

Over five years ago, the visual aids in the presentations at the annual ODOT CEU Herbicide Applicator Workshops provided by the OSU RVM program were switched to a completely digital format. All educational presentations were/are subsequently given using a digital projector interfaced to a portable PC, with the PC running Microsoft Power Point™ software. To view the annual training slides, interested parties would need access to Microsoft PowerPoint (Version 5.1.26 or later) software. See Appendix B for computer system requirements. MS PowerPoint is available from Microsoft Corporation, for a fee. Most commonly, PowerPoint is provided with Microsoft Office software packages (for purchase software). Details on purchasing PowerPoint can be obtained through local computer/software stores or on the web at: www.microsoft.com. We do not feel it appropriate to discuss prices of this software since ODOT would likely be able to negotiate prices with the manufacturer since many copies of the software would be needed.

In the winter 2004 workshops, a video (using a DVD) will also be used in addition to Power Point slide presentations. We would like to make all of the annual presentations and non-copyrighted videos available to each county facility for future reference. While ODOT personnel are exposed to the information in these presentations at the workshops each year, the presentations would be available for filing and future reference to attendees in the form of CDs. CDs are a very inexpensive storage media. To view digital videos, parties would need to have access to software such as WinAmp 5.02 player or RealPlayer™. These video software players are available free of charge at web addresses: www.winamp.com or http://www.real.com/, respectively. System requirements for these software packages are shown in Appendices C and D, respectively.

**Expanding Educational and Training Opportunities**

As previously mentioned, educational programs that are based in a digital format have a few very distinctive advantages over past conventional training. Currently ODOT herbicide training is accomplished with annual workshops that satisfy both state certifications requirements ODAFF (Oklahoma Department of Agriculture, Food, and Forestry) and ODOT requirements (Equipment Operators Training Program). Occasionally some ODOT certified personnel cannot attend scheduled training programs. There are not a large number of suitable alternatives for those particular personnel unless we look towards electronic training. The ODAFF has not allowed certified herbicide applicators to get official training credits (CEUs) for completing on-line training programs in the past. However, it is very likely in the near future that approved on-line training will be available for personnel whom find themselves in a training predicament. In no way does OSU support replacing today's conventional training efforts with electronic training, but it would be very useful as a supplement or as a band-aid to help out a few personnel whom have fallen short on their annual training requirements.

**Computer Security Issues**

As with anything done on the computer the issue of security comes into play. The basic rule of thumb is anything that is maintained or communicated electronically is vulnerable to computer viruses, theft, or use in an unofficial business capacity. As far as protecting computers from viruses and the like it is a matter of maintaining the necessary virus detection programs and following up with timely software upgrades. This is and should be standard procedure for any computer that works on-line or uses shared documents from other computers. As far as security issues and verification of future on-line training efforts are concerned, the ODAFF, OSU, or any other entity that was to offer on-line training would be required to have a means of verifying attendees to satisfy ODAFF requirements. Other security issues will likely arise but the fact that one is using electronic communications means that quick adjustments can be made.

## 3.0 Summary with Recommendations

It is the recommendation of the OSU RVM program that ODOT, along with OSU, make a concerted effort to expand the use of PCs in assisting with its roadside vegetation management programs across the state. In many instances ODOT currently maintains its computers well but there are some tasks that could be done to specifically benefit their herbicide program. We recommend that personnel involved in vegetation management have ready access to PCs that have e-mail access (choice of software rests with ODOT) as well as machines that have pdf viewing capability (Acrobat Reader 6.0 software suggested), capability to view PowerPoint presentations (Microsoft PowerPoint 2002 software or later versions recommended) as well as video play capability (WinAmp 5 or RealPlay 10 software recommended). To comply with these recommendations, the appropriate computer hardware, software and internet connectivity must be obtained (see Section 2.0 of this report).

The OSU RVM program will immediately begin offering (ODOT to request by verbal or written means) copies of all training programs to ODOT personnel in the form of CDs. The OSU RVM program will also make all annual reports available on CDs. The OSU RVM personnel will also be producing a new training manual in 2005 which will be available on CD. It will be critical for ODOT to make sure that their computers are able to take advantage of these and any future electronic documents.

The OSU RVM personnel are not “computer experts” but rather regular personal computer users who utilize computers to best perform our responsibilities. We encourage ODOT personnel to seek out computer hardware, software and connectivity expertise within ODOT or through computer technical support resources in private industry. This being said, we are available on a limited basis to ODOT personnel that are involved in the vegetation management effort in order to help them find answers to software need & compatibility issues and make recommendations so that ODOT personnel can take advantage of the benefits that computers have to offer with regards to improved roadside vegetation management practices.

## Appendix A

### Adobe Reader™ (Version 6.0.1) System Requirements For Operation Under Windows System Software

-Intel® Pentium® processor
-Microsoft® Windows 98 Second Edition, Windows Millennium Edition, Windows NT® 4.0 with Service Pack 6, Windows 2000 with Service Pack 2, Windows XP Professional or Home Edition, Windows XP Tablet PC Edition
-32MB of RAM (64MB recommended)
-60MB of available hard-disk space
-Internet Explorer 5.01, 5.5, 6.0, or 6.1

Source: Adobe Acrobat Reader website at:
http://www.adobe.com/products/acrobat/acrrsystemreqs.html

## Appendix B

## PowerPoint™ (Version 2002) Minimum System Requirements For Operation Under Windows System Software

| | |
|---|---|
| Computer/Processor | Computer with Pentium 133 megahertz (MHz) or higher processor; Pentium III recommended |
| Memory | RAM requirements depend on the operating system used:<br>• **Windows 98, or Windows 98 Second Edition**<br>24 MB of RAM plus an additional 8 MB of RAM for PowerPoint<br>• **Windows Me, or Microsoft Windows NT®**<br>32 MB of RAM plus an additional 8 MB of RAM for PowerPoint<br>• **Windows 2000 Professional**<br>64 MB of RAM plus an additional 8 MB of RAM for PowerPoint<br>• **Windows XP Professional, or Windows XP Home Edition**<br>128 MB of RAM plus an additional 8 MB of RAM for PowerPoint |
| Hard Disk | Hard disk space requirements will vary depending on configuration; custom installation choices may require more or less. Listed below is the minimum hard disk requirement for Outlook:<br>• 115 MB of available hard disk space<br>An additional 115 MB is required on the hard disk where the operating system is installed. Users without Windows XP, Windows 2000, Windows Me, or Office 2000 Service Release 1 (SR-1) require an extra 50 MB of hard disk space for System Files Update. |
| Operating System | Windows 98, Windows 98 Second Edition, Windows Millennium Edition (Windows Me), Windows NT 4.0 with Service Pack 6 (SP6) or later,* Windows 2000, or Windows XP or later. |
| Drive | CD-ROM drive |
| Display | Super VGA (800 × 600) or higher-resolution monitor with 256 colors |
| Peripherals | Microsoft Mouse, Microsoft IntelliMouse®, or compatible pointing device |

* Systems running Windows NT 4.0 SP6 must have Microsoft Internet Explorer 4.01 SP1 or later.

### Additional items or services required to use certain features:

- For multimedia and sound:
    - Accelerated video card or MMX processor for improved graphics rendering
- For speech recognition (available for U.S. English only):
    - Pentium II 400-MHz or higher processor
    - 128 MB of RAM or more
    - Close-talk microphone and audio output device

- Microsoft Exchange, Internet SMTP/POP3, IMAP4, or other MAPI-compliant messaging software required to use e-mail
- Microsoft Exchange Server required for certain advanced collaboration functionality in Microsoft Outlook®
- Collaboration features compatible with Office 97 or later
- Some Internet functionality may require Internet access and payment of a separate fee to a service provider; local or long-distance charges may apply
- 14,400 or higher-baud modem
- Graphics tablet recommended for handwriting-input features

Source: Microsoft Corporation Website: www.microsoft.com

## Appendix C

### WinAmp™ (Version 5) Minimum & Recommended Computer System Requirements For Operation Under Windows System Software

**Minimum system requirements**

- 500MHz Pentium III or comparable
- 64MB RAM
- 15MB Hard Disk Space
- 16bit Sound Card
- Windows 98 SE, Windows ME, Windows 2000, Windows XP, Windows 2003
- 1x speed or greater CD Burner (Required for Burning)
- 2x speed or greater CDROM (Required for Ripping)

**Recommended system requirements**

- 1.5 GHz Pentium IV or comparable
- 128MB RAM
- 30MB Hard Disk Space
- 32bit Sound Card
- Windows 2000, Windows XP
- 8x speed or greater CD Burner (Required for Burning)
- 16x speed or greater CDROM (Required for Ripping)

Source: WinAmp website at: http://www.winamp.com/player/faq/#30

## Appendix D

**RealPlayer™ (Version 10) Minimum & Recommended Computer System Requirements For Operation Under Windows System Software**

**RealPlayer Minimum System Requirements**
- 350MHz Intel Pentium II processor or equivalent
- 64MB of RAM(128MB on Windows XP or later)
- 52MB available disk space
- 28.8Kbps modem (audio only)
- 16-bit sound card and speakers
- 65,000-color video display card set to display at 800x600 (video)
- Windows 98SE, Windows ME, Windows NT 4.0 with Service Pack 6 or later(playback only), Windows 2000 with Service Pack 2 or later, or Windows XP
- IE 5.0 or later

**RealPlayer Recommended System Requirements**
- 500 MHz Intel Pentium III processor or greater (supports simultaneous record/playback features) (supports simultaneous record/playback features)
- 128MB of RAM
- High-speed Internet connection (audio/video)
- Full Duplex sound card and speakers
- 65,000-color video display card set to display at 800x600 or higher (video)
- CD writer (for CD burning features)
- 700+ MB available disk space for writing Media and MP3 CDs (not required for audio CDs)
- DVD player and DVD playback software (for DVD playback)
- Analog recording requires an inline audio cable or microphone.
- Windows 98SE, Windows ME, Windows 2000 with Service Pack 2 or later, or Windows XP
- Internet Explorer 6.0 or later
- Windows Media Player 9.0 or later
- QuickTime 6.4 or later
- If using Screen-Reader software: JAWS (v4.02 or greater recommended) or WindowEyes (v4.21 or greater)

If current Minimum System Requirements are not met there may be an option of obtaining a previous version of the video player that has reduced system requirements.

Source: RealOne™ website at: http://www.real.com/moreinfo/playerplus_sysreq.html