



Michigan Department of
AGRICULTURE
& Rural Development

**Generally Accepted Agricultural
and Management Practices for
Pesticide Utilization and
Pest Control**

January 2012

Michigan Department of Agriculture
& Rural Development
PO Box 30017
Lansing, MI 48909

PH:(517) 373-9797
www.michigan.gov/mda

In the event of an agricultural pollution emergency such as a chemical/fertilizer spill, manure lagoon breach, etc., the Michigan Department of Agriculture & Rural Development and/or Michigan Department of Environmental Quality should be contacted at the following emergency telephone numbers:

Michigan Department of Agriculture & Rural Development: (800) 405-0101

**Michigan Department of Environmental Quality
Pollution Emergency Alerting System (PEAS): (800) 292-4706**

If there is not an emergency, but you have questions on the Michigan Right to Farm Act, or items concerning a farm operation, please contact the:

**Michigan Department of Agriculture & Rural Development
Right to Farm Program
P.O. Box 30017
Lansing, Michigan 48909
(517) 373-9797
(877) 632-1783-Toll Free
(517) 335-3329 FAX**

**Authority: Act 93 of 1981, as amended
TOTAL NUMBER OF COPIES PRINTED: 100
TOTAL COST: \$ 158.23 COST PER COPY: \$ 1.58**

TABLE OF CONTENTS

PREFACE	iii
I. INTRODUCTION	1
II. PESTICIDE UTILIZATION AND PEST CONTROL PRACTICES	2
Pesticide Labels	2
Certification	4
Application Equipment, Methods and Pesticide Formulations	4
Equipment Use and Calibration	6
Worker and Handler Safety	6
Alternative Pest Management Techniques	7
Protection of the Environment	7
Agriculture Pollution Emergencies	8
Excess Spray Mixtures and Rinsates	8
Mixing and Loading	9
Application and Standards for Use	9
Record Keeping	11
Transport of Pesticides	12
Disposal of Unused Pesticides	12
Disposal of Pesticide Containers	12
On Farm Storage and Containment of Pesticides	13
Pesticide Use Recommendations and Technical Assistance	14
APPENDIX I REFERENCES ON STATE AND FEDERAL LAWS AND REGULATIONS	16
APPENDIX II REFERENCES ON AGENCY RECOMMENDATIONS	20
Review Committee	22

PREFACE

The Michigan legislature passed into law the Michigan Right to Farm Act (PA 93 of 1981, as amended), which requires the establishment of Generally Accepted Agricultural and Management Practices (GAAMPs). These practices are written to provide uniform, statewide standards and acceptable management practices based on sound science. These practices can serve producers in the various sectors of the industry to compare or improve their own managerial routines. New scientific discoveries and changing economic conditions may require necessary revision of the practices.

The Generally Accepted Agricultural and Management Practices that have been developed are the following:

- 1) 1988 - Manure Management and Utilization
- 2) 1991 - Pesticide Utilization and Pest Control
- 3) 1993 - Nutrient Utilization
- 4) 1995 - Care of Farm Animals
- 5) 1996 - Cranberry Production
- 6) 2000 - Site Selection and Odor Control for New and Expanding Livestock Production Facilities
- 7) 2003 - Irrigation Water Use
- 8) 2010 - Farm Markets

These practices were developed with industry, university and multi-governmental agency input. As agricultural operations continue to change, new practices may be developed to address the concerns of the neighboring community. Agricultural producers who voluntarily follow these practices are provided protection from public or private nuisance litigation under the Right to Farm Act.

This GAAMP does not apply in municipalities with a population of 100,000 or more in which a zoning ordinance has been enacted to allow for agriculture provided that the ordinance designates existing agricultural operations present prior to the ordinance's adoption as legal non-conforming uses as identified by the Right to Farm Act for purposes of scale and type of agricultural use.

The Web site for the 2012 GAAMPs is <http://www.michigan.gov/gaamps>.

I. INTRODUCTION

American agricultural producers have been able to meet the demands of the public for food through the use of improved agricultural technology. For the past 50 years, agricultural technology has included the use of pesticides and other pest management techniques. Virtually all agricultural commodities produced in Michigan may be threatened by serious pest problems and treated with pesticides to prevent or overcome insect, disease, nematode, vertebrate, or weed pests. Currently, agricultural pesticides, as broadly defined by the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), are utilized for livestock and crop protection and production.

The use of pesticides has, however, caused environmental and human safety concerns. These include the appearance of pesticide contamination in surface and groundwater in Michigan, destruction of beneficial or non-target organisms, appearance of resistant pest species, and pest population resurgence. Strategies for managing pests continue to be developed to reduce undesirable pesticide effects.

Agricultural producers in Michigan are encouraged to adopt practices that utilize pesticides only as needed. Such practices employ the appropriate use of all available information, methods, and technologies to achieve the desired commodity quality and yield while minimizing any adverse effects on non-target organisms, humans, and the environment. Such practices include, but are not limited to, Integrated Pest Management (IPM), organic production methods, or sustainable agriculture. These practices normally involve environmental and biological monitoring such as scouting, trapping, use of pest prediction models, etc., to help producers determine when pest populations reach the economic action threshold and selection and use of safe and effective control measures. These may include, but are not limited to, biological, chemical (biopesticides and reduced risk pesticides), cultural, mechanical, regulatory-controls (e.g. inspections, quarantines, fumigation, sanitation, etc.), and other pest management methods.

Agricultural producers who comply with pesticide labels and labeling, relevant state and federal laws, Michigan State University (MSU) pesticide recommendation bulletins, and follow pertinent sections of these Generally Accepted Agricultural and Management Practices (GAAMPs) for Pesticide Utilization and Pest Control, will meet provisions of PA 93 of 1981, as amended, the Right to Farm Act, which is administered by the Michigan Department of Agriculture & Rural Development (MDARD).

A farm or farm operation that conforms to these and other applicable current GAAMPs adopted under the Michigan Right to Farm Act (PA 93 of 1981, as amended) shall not be found to be a public or private nuisance. This protection also covers farm operations that existed before a change in the land use or occupancy of land within one mile of the boundaries of the farmland, if before that change, the farm would not have been a

nuisance. Likewise, this conditional protection applies to any of the following circumstances:

- a. A change in ownership or size.
- b. Temporary cessation or interruption of farming.
- c. Enrollment in governmental programs.
- d. Adoption of new technology.
- e. A change in type of farm product being produced.

II. PESTICIDE UTILIZATION AND PEST CONTROL PRACTICES

PESTICIDE LABELS

All pesticides intended for sale bear labels mandated by law that contain their legal and authorized uses and information on how to store, mix, apply, and dispose of the product and container. In addition to labels manufacturers also provide supplemental labeling, which includes other specific use directions. Everyone using pesticides must follow label and labeling instructions.

1. Pesticide labels and labeling contain specific information that constitutes the legal parameters for pesticide use. Labels and product information may contain the following:
2. Trade name, common name, chemical name, inert ingredients of toxicological concern, formulation, U.S. Environmental Protection Agency (EPA) registration number, amount of active ingredient per unit, and net contents of the package.
3. Manufacturer or formulator name, address and telephone number, and EPA establishment number.

Required signal words and precautionary statements by toxicity category:

- a. Class I - Danger-Poison includes skull and crossbones; poisonous if swallowed. Do not breathe vapor. Do not get in eyes, on skin, or on clothing.
- b. Class II - Warning may be fatal if swallowed. Do not breathe vapors. Do not get in eyes, on skin, or on clothing.
- c. Class III - Caution harmful if swallowed. Avoid breathing vapors. Avoid contact with skin.
- d. Class IV – Caution no caution statement required.

4. Use classification:
 - a. Restricted use - requires applicator certification to purchase and use.
 - b. Unclassified (general use) - applicator certification not required.
5. Statement of practical treatment: includes first aid for human exposure.
6. Precautionary statements: includes worker safety rules, environmental hazards, endangered species, physical hazards, and the statement "KEEP OUT OF REACH OF CHILDREN."
7. General information about the pesticide.
8. Information on storage and disposal of the pesticide and container.
9. Application procedures (may include equipment, volume, pressure requirements, weather, adjuvants, mixing, cleaning, field preparation, etc.).
10. Pests controlled.
11. Specific use recommendations, including but not limited to: site, maximum allowable rate, timing, crop and pest life stage, rotational restrictions, minimum number of days between last application and harvest, etc.
12. Reentry interval, and/or restricted entry interval.
13. Use restrictions (Examples: depth to groundwater, soil types, sensitive sites, setbacks, etc.).
14. Reference to Federal Worker Protection Standard of 1992.
15. Reference to State Management Plans for Groundwater Protection.

For detailed information on specific label requirements, refer to MSU Extension Bulletins E-2195 and E-2182.

CERTIFICATION

Purchasers and applicators of restricted-use pesticides must comply with the certification requirements of the 1994 Michigan Natural Resources and Environmental Protection Act, PA 451 of 1994, as amended (PA 451), Part 83 and detailed in Regulation 636 "Pesticide Applicators." This requires studying training manuals prepared by MSU Extension and passing an examination administered by MDARD.

Recertification is required every three years and may be obtained by one of two methods. The applicator may study a training manual (Extension Bulletin E-2195) and pass an examination, or attend classes accredited by MDARD for continuing education credits and obtain sufficient credits for the specific category of certification. Both methods ensure that additional information was provided to applicators in the safe and effective use of restricted-use pesticides.

A current listing of approved pesticide applicator certification training seminars can be found at www.mda.state.mi.us/industry/schedule.html.

The listing for the pesticide certification exams can be found by following these steps: Go to www.michigan.gov/mda, Click on Licensing; Click on Pesticides; Click on Pesticide Application Certification; Click on Examination Process and Examination Schedule; Click here to go to map of the State of Michigan; and Click on a county or region.

APPLICATION EQUIPMENT, METHODS, AND PESTICIDE FORMULATIONS

There are many types of pesticide application equipment and many pesticide formulations. Application methods for particular formulations may be specified on the label. To prevent degradation of water resources (and therefore, to comply with federal and state laws) the applicator should choose a method that is accurate in applying the pesticide to the target.

A person applying pesticides may employ any method of application not prohibited by the pesticide label or labeling. Innovative application methods and equipment not specifically prohibited on a label or labeling are encouraged if they can improve the accuracy of application to the target and/or reduce total active ingredient or spray volume used.

Generally accepted methods of pesticide application include, but are not limited to, the following equipment, methods, and formulations:

EQUIPMENT	METHOD	FORMULATION
airplane/helicopter	aerial	aerosol
air assisted applicator	banding	aqueous suspension
air blast sprayer	chemigation	bait
backpack sprayer, duster	controlled droplet application (cda)	control release formulation
controlled droplet applicator	dips & drenches	dispersible granule
electrostatic sprayer	dusting	dry flowable
fabric mesh & other products impregnated with pesticides	early pre-plant (epp)	dry soluble
fogger	foliar spray	emulsifiable concentrate
fumigation equipment	hopperbox treatment	emulsifiable solution
granular applicator	granular surface application	encapsulated
ground sprayer	impregnated on fertilizer	flowable
hand gun	In furrow	gas
hand sprayer	Injection	granule
hopperbox application	pre-emergence (pre)	Liquid
incorporation into asphalt	pre-transplant	oil solution
injector	Pre-plant incorporated (ppi)	pellet
irrigation equipment (chemigation)	post-directed	ready to use
low volume applicator	post-emergence (post)	soluble granules
mister	post-transplant	soluble powder
recycling sprayer	ropewick	water dispersible granule
roller	seed treatment	wettable powder
speed treated	ultra low volume (ulv)	
spreader		
transplanter & seeder		
wick		

EQUIPMENT USE AND CALIBRATION

The operator shall inspect and maintain all pesticide application equipment to ensure the proper and safe operation of equipment, as well as, the appropriate rate and distribution of application. Equipment must be correctly calibrated at least annually, and leaks minimized to apply specific materials and formulations of pesticides at the intended rate and distribution pattern.

For detailed information on specific label requirements refer to MSU Extension Bulletin E-2195.

WORKER AND HANDLER SAFETY

Any person applying or handling pesticides or working in pesticide treated areas must be knowledgeable in the safe use and handling of pesticides. Everyone must use safety equipment specified on pesticide labels.

The Federal Worker Protection Standard of 1992 protects employees involved in the production of agricultural products on farms, forests, greenhouses, and nurseries from occupational exposure to agricultural pesticides. For both handlers and workers, the standard requires training, notification, and information on the proper use of protective equipment. Handlers include those who apply, load, mix, transport, clean and repair pesticide application equipment, etc. Workers include persons who may physically come in contact with pesticides in treated areas while performing tasks related to production and harvesting. Both need to be trained on the recognition of pesticide poisoning symptoms, how to avoid exposure, and emergency assistance, as well as, be provided personal protective equipment and transportation for medical assistance. Handlers need additional training. Employers are required to provide the training, personal protective equipment, decontamination sites, transportation, central notification points, field posting for the duration of the restricted-entry intervals, and maintain pesticide application records for three years. For specific information concerning this law, refer to the EPA-prepared book, "The Worker Protection Standard for Agricultural Pesticides, How to Comply, What Employers Need to Know."

Enforcement of the standard occurs in two phases. Label specific requirements will be enforceable when they appear on pesticide labels. These requirements include:

1. Using label specified personal protective equipment;
2. Obeying label specific restrictions on entry to treated areas during the restricted-entry intervals; and
3. Obeying the requirement on labels that provide oral warnings and/or treated area posting.

The generic requirements enforced as of January 1, 1995, include:

1. Providing decontamination supplies
2. Training of workers and handlers
3. Providing certain notification and information
4. Cleaning, inspecting, and maintaining personal protective equipment
5. Emergency assistance.

ALTERNATIVE PEST MANAGEMENT TECHNIQUES

Growers may use alternatives to pesticides to manage pests. These may include, but are not limited to, audible cannons, ultra-sonic and audio sound equipment, strobe lights, firearms, balloons, scarecrows, streamers, netting, traps and fences for wildlife management, tillage for weed control, controlled burning, traps for pest management, transgenic plants, introduced or managed biological control agents, mechanical controls, resistant varieties, cover crops, crop vacuums, flammers, mulching, composting, crop rotation, pheromones for mating disruption and trapping, weather monitoring equipment for pest prediction, etc. All such techniques should be used according to dealer and/or manufacturer recommendations and must be used according to federal and state agency recommendations and/or regulations.

PROTECTION OF THE ENVIRONMENT

Agriculture involves management of biological systems to produce food, feed, fur, and fiber. Pesticides and other pest management practices cause a specific effect in a biological system.

For agriculture to be sustained at biologically and economically sound production levels, growers should recognize their responsibility to be stewards of the soil and the environment. Growers should be aware of environmentally sensitive conditions in their production system and adjust management practices to ensure future productivity and environmental integrity. For example, growers should limit use of highly or moderately leachable pesticides in areas with coarse-textured soils or high water tables. (Reference Natural Resources Conservation Service [NRCS] Technical Guide 595-Pest Management Standard, MSU pesticide recommendations, etc.)

A person applying pesticides in agricultural production should follow label instructions and use good judgment to avoid adverse effects to human health and the environment. A pesticide applicator should make a determined effort to:

1. Assess pest populations and apply pesticides only when needed to manage these pests during the vulnerable or appropriate stage of their life cycle.

2. Avoid directing a pesticide application beyond the boundaries of the target site.
3. Avoid the potential for drift or runoff. (See page 10 - #2. Pesticide Drift for information regarding a drift management plan.)
4. Avoid applications that would result in exposure of persons within or adjacent to the target site, except when such pesticides have approved use patterns permitting treatment of populated areas for specific pest management programs. (e.g., gypsy moth, mosquito, etc.)
5. Avoid applications that would lead to contamination of aquifers (PA 451 of 1994 as amended, Part 87, and Part 31, Rule 2203) or runoff to surface waters (Reference NRCS Technical Guide 595-Pest Management Standard.) Applicators need to be aware of, and adhere to, any pesticide use directions or references on pesticide labels concerning state management plans. These plans are specifically developed for the protection of groundwater.
6. Utilize safety measures including backflow safety devices when applying pesticides through irrigation systems.

AGRICULTURE POLLUTION EMERGENCIES

The Michigan Department of Agriculture & Rural Development has a toll-free, 24-hour hotline available for reporting agricultural pesticide, fertilizer, and manure spills. The **MDARD Agriculture Pollution Emergency (APE) Hotline, (800) 405-0101**, is designed to improve response time and provide appropriate technical assistance, reducing the environmental risk associated with an agricultural chemical spill.

Users of agricultural pesticide, fertilizer, and manure products should report all uncontained spills or releases to the MDARD APE Hotline. MDARD has the responsibility to initiate response activities to immediately stop or prevent further releases at agrichemical spill sites and will do so through possible interaction and assistance from the Michigan Department of Environmental Quality (MDEQ). The main goal of the MDARD Spill Response Program is to clean up all agrichemical spills quickly and completely and get the recovered material out to where it can be used for its intended purpose. This goal is accomplished through providing immediate response, technical assistance, a common sense approach to clean up, and utilization of legal land application of recovered materials.

EXCESS SPRAY MIXTURES AND RINSATES

Use excess mixtures or rinsates on labeled application sites at or below labeled rates as listed on the label. Excess pesticide mixtures include, but are not limited to: leftover solution when spraying is done; haul-back solutions from a spraying job interrupted by weather, and equipment breakdown. All rinsates, including pesticide container rinsate, should be put in the sprayer as part of the mixing solutions.

MIXING AND LOADING

Pesticides should be mixed and loaded according to label directions in a manner that does not harm individuals, animals, or the environment. The greatest risk occurs when handling pesticide concentrates. Follow these practices to reduce risk:

1. Pesticide mixing and loading areas should be located in such a manner as to reduce the likelihood of a spill or overflow contaminating a water supply. Acceptable areas may include temporary or permanent sites, which are described in MSU Extension Bulletin E-2335 and E-2195.
2. Review the label before opening the container so that you are familiar with current mixing and usage directions. If two or more pesticides are to be mixed, they must be compatible and mixed in the proper order.
3. Measure accurately. Keep all measuring devices in the pesticide storage area to avoid their being used for other purposes. Measuring containers or devices should be rinsed and the rinse water put into the spray tank.
4. Avoid back-flow when filling a spray tank to prevent water source contamination. The simplest technique is an air gap where the fill hose does not come in contact with the tank water. Back-flow prevention devices may also be used. (Reference MSU Extension Bulletin E-2195).
5. A sprayer should be monitored while it is being filled.
6. Mix only the amount you plan to use immediately. Pesticides should be applied as soon as possible to maintain product effectiveness and reduce the potential for accidental discharge.
7. Clean up spills immediately. Material spilled during mixing or loading may be applied to labeled sites at or below labeled rates. All spills to the soils and/or waters of Michigan must be reported to the state of Michigan according to the Natural Resources and Environmental Protection Act of 1994. Spills exceeding reportable quantities, under SARA Title III, must be reported to the appropriate agencies (Reference MSU Extension Bulletin E-2575) as well as the Michigan Department of Agriculture & Rural Development, APE Hotline, (800) 405-0101.

APPLICATION AND STANDARDS FOR USE

The Pesticide Use Regulation 637 contains components that are applicable to private applicators using pesticides for agricultural operations.

1. Spill Kits

Any person who mixes, loads, or otherwise uses pesticides shall have immediate access to a spill kit. The spill kit requirement does not apply to a person who

used single containers of use dilution pesticides in a quantity that is less than 16 ounces.

Spill kits should contain materials appropriate to the material being applied and equipment being used.

2. Pesticide Drift

All pesticide applications are required to be made in a manner that minimizes off-target drift. When pesticide off-target drift is anticipated due to the nature of the application, a Drift Management Plan shall be utilized by the applicator to minimize the occurrence and adverse effects of off-target drift.

The Drift Management Plan shall include drift minimization practices. Such practices may include, but are not limited to, any of the following:

- a. The use of the largest spray droplets that are created by a combination of special nozzles, pressures, and particulating agents to accomplish the objectives of the applications.
- b. The use of specialized equipment that is designed to minimize off-target drift.
- c. The use of the closest possible spray release to the target.
- d. The use of the lowest effective rates of application of the pesticide.
- e. The establishment of a no-spray buffer zone. The buffer zone may be treated with non-powered equipment.
- f. The identification of the maximum wind speed and direction under which applications can be made.
- g. The use of wind shields or windbreaks to contain spray drift or deflect spray drift away from sensitive areas.
- h. Other specific measures stated in the plan that are effective in minimizing the incidence of off-target drift.

A Drift Management Plan shall be in writing, and MDARD will consider the presence and use of a written Drift Management Plan as a factor in determining appropriate enforcement action in the event of drift.

Pesticide off-target drift does not include the off-target movement of a pesticide by means of erosion, volatilization, or windblown soil particles after the application of a pesticide.

RECORD KEEPING

Farm operators should maintain accurate records of all agricultural crop applications of pesticides for at least three years, and preferably five years.

The federal pesticide recordkeeping regulations, the federal worker protection standards, and the Michigan Right to Farm current GAAMPs all have requirements related to pesticide recordkeeping. The following table is intended to clarify which data are required for each. The federal recordkeeping regulations and worker protection standards are laws. Right to Farm GAAMPs are voluntary guidelines.

USDA Record Keeping Regulations (Redkp)

The data required by these regulations must be kept by private pesticide applicators for each restricted use pesticide application.

Worker Protection Standards (WPS)

The information listed in the table must be posted for at least 30 days after the end of the restricted-entry interval (REI), or, if there is no REI, for at least 30 days after the end of the application.

Michigan Right to Farm (RTF)

A portion of the Right to Farm document addresses pesticide recordkeeping. By following these voluntary guidelines, producers can reduce their liability.

Table Comparing Record Keeping Requirements for Private Pesticide Applicators

Federal Recordkeeping Regulations (Redkp), Worker Protection Standards (WPS), Michigan Right to Farm (RTF)

Data to Record	Redkp	WPS	RTF
Month/day/year	x	x	x
Time of application		x	
Pesticide brand/product name	x	x	x
Pesticide formulation			x
EPA registration number	x	x	x
Active ingredient(s)		x	
Restricted-entry interval (REI)		x	
Rate per acre or unit			x
Crop, commodity, stored product, or site that received the application	x		x
Total amount of pesticide applied	x		x
Size of area treated	x		x
Applicator's name	x		x
Applicator's certification number	x		x
Location of the application	x	x	x
Method of application			x
Target pest			x
Carrier volume per acre			x

Developed by the Michigan State University Pesticide Education Office - (updated 11/7/95)

Commercial applicators have 30 days to send a copy of records required by USDA to clients. If a medical emergency occurs before 30 days, commercial applicators must provide the necessary information immediately upon request.

For federally restricted use pesticides (RUP), records must incorporate all information required by Title XIV of the Federal Food, Agriculture, Conservation and Trade Act Subtitle H, Section 1491, Pesticide Record Keeping.

TRANSPORT OF PESTICIDES

A person transporting pesticides will do so in such a manner as to avoid discharge into the environment, human exposure, and contamination of animal feed and human food.

DISPOSAL OF UNUSED PESTICIDES

Michigan residents may dispose of unused and unwanted pesticides through the Michigan Clean Sweep Program. The Michigan Groundwater Stewardship Program, in cooperation with county and local units of government, has established permanent Clean Sweep sites located throughout the state.

Individual Michigan residents may dispose of pesticides by taking them to one of these Clean Sweep sites where they will be collected, packaged for shipping, and disposed of properly. There is no charge for this service. Program costs are covered by the Michigan Groundwater Stewardship Program and a grant from the EPA, and services provided by the local cooperators.

DISPOSAL OF PESTICIDE CONTAINERS

Always dispose of containers in a way that minimizes impact on the environment and is consistent with the label specifications. It is desirable to use reusable, returnable, or recyclable containers when available. Pesticide containers should be emptied completely, rinsed when appropriate, and in general rendered a non-hazardous waste.

1. Triple rinse or use other recommended practices, such as pressure rinsing to clean all glass, metal, or plastic containers to render them non-hazardous waste (Reference AM-95, MSU Extension Bulletin E-2784 and E-2195).
2. After rinsing, puncture metal and plastic containers. They can then be recycled or buried in a sanitary landfill approved under PA 451 of 1994, as amended, Part 115.
3. Michigan has had an agriculture plastic pesticide container recycling program in operation since 1992. This program allows for the grinding and recycling of clean plastic containers. For more information on this program, contact MDARD at (517) 241-3933 or Michigan Agri-Business Association at (517) 336-0223.

4. Dispose of rinsed glass containers in a sanitary landfill approved under PA 451 of 1994, as amended, Part 115.
5. Open burning of pesticide containers is prohibited by state statute, PA 451 of 1994, as amended, Part 55.

ON FARM STORAGE AND CONTAINMENT OF PESTICIDES

All pesticides should be stored in a manner that maintains environmental quality, ensures human and animal safety, and preserves product and container integrity. (Reference MSU Extension Bulletin E-2335, E-2195, and NRCS Agricultural Containment Facilities - 702). Legal storage requirements are on pesticide labels.

1. Bulk pesticide storage site - A site should be selected that minimizes potential for contamination of surface or groundwater by drainage, runoff, or leaching. Locate the storage site an adequate distance away from wells, surface water, and other sensitive areas. For purposes of these practices, a bulk storage area is an area where pesticides are stored over 15 days in a single container greater than 55 gallons (liquid) or 100 pounds (dry material).
 - a. Existing bulk pesticide storage areas should be located a minimum of 50 feet from any single-family residential water well, 200 feet from a public water supply, and a minimum of 200 feet from surface water. If an existing bulk storage area is located closer than 50 feet from a single-family residential water well, 200 feet from a public water supply, or less than 200 feet from surface water, appropriate security measures should be taken to prevent pesticide contamination of surface water or groundwater.
 - b. New bulk pesticide storage areas should be located a minimum of 150 feet from any single family residential water well and a minimum of 200 feet from surface water. When planning a new facility, see MSU Extension Bulletin E-2335 or NRCS ACF-702 for information on design and construction and for the required set-back distance from drinking water supplies. The set-back distance from any Type I or Type IIA public water supply well is 2,000 feet, if the public water supply does not have a well-head protection program. If there is a well-head protection program, the facility must be located outside the delineated well-head protection area. For Type IIB and Type III public water supply wells, the set-back is 800 feet. For more information on these set-back distances, see PA 399 of 1976, as amended, the State of Michigan, Safe Drinking Water Act, PA 368 of 1976, as amended. The Michigan Public Health Code, as amended.

These set-back distances pertain to bulk pesticide storage sites and facilities and do not include application sites. A storage facility is a place for the safe keeping

of pesticides. An application site is where pesticides can be used according to label specifications.

2. Storage facility - Pesticides should be stored in a facility that is securable to prevent unauthorized access (Reference MSU Extension Bulletin E-2784, MSU Extension Bulletin E-2335 and MSU Extension Bulletin E-2195).
 - a. Keep all pesticides out of the reach of children, pets, livestock, and unauthorized people.
 - b. Within the storage area, store pesticides in a manner to prevent cross contamination with other pesticides or accidental misuse. Store pesticides away from food, feed, potable water supplies, veterinary supplies, seeds, and protective equipment.
 - c. The storage facility should be ventilated to reduce dusts and fumes.
 - d. Keep pesticides cool, dry, and out of direct sunlight. Consider freeze protection, as necessary.
 - e. Post the pesticide storage area with highly-visible, weather-proof signs that indicate that pesticides are stored there. Also post "NO SMOKING" signs.
 - f. Store pesticides only in their original labeled containers, or containers appropriate for pesticide storage that are properly labeled.
 - g. Have absorbent materials, such as cat litter box filler or sawdust and clean-up equipment immediately available. A fire extinguisher approved for chemical fires should also be easily accessible.
 - h. The storage of combustible and flammable chemicals may require special storage requirements. Contact your local fire chief and refer to National Fire Prevention Association (NFPA) Code 395 for further information.

PESTICIDE USE RECOMMENDATIONS AND TECHNICAL ASSISTANCE

Michigan State University Extension provides education and recommendations on correct and effective use of pesticides on most agricultural commodities grown in Michigan (See Appendix II).

Growers meet pesticide rate standards for GAAMPs if they apply pesticides at or less than legal labeled rates. Pesticide uses for commodities not included in MSU recommendations but in accordance with their respective labels or labeling will also meet the application rate requirements of these GAAMPs.

The Natural Resources Conservation Service (NRCS) role is to provide technical assistance to agricultural producers. Its Field Office Technical Guide (FOTG) provides the standards, which establish minimal acceptable elements of conservation plans designed to maintain soil productivity and protect the environment.

Financial assistance may be available through USDA Farm Bill programs. The Michigan Groundwater Stewardship Program (MGSP) provides for technical assistance, grants, research, and demonstration projects for agricultural producers to facilitate improvement of their practices that may impact groundwater.

Spill Response Program - This program helps reduce environmental impacts associated with pesticide, fertilizer, and manure spills. If a spill occurs, agri-chemical users call MDARD's 24-hour hotline at (800) 405-0101. This gives access to information, technical assistance, and in some cases, financial assistance for dealing with the control, containment, and cleanup of a spill. MGSP provides funding for this program.

Clean Sweep Program - Individuals can bring unwanted pesticides to one of Michigan's Clean Sweep sites for proper disposal at little or no cost to the landowner. The MGSP, along with the Environmental Protection Agency and local agencies, pays for the disposal of these pesticides. A list can be found at <http://www.michigan.gov/mda>.

The Michigan Certified Crop Adviser (CCA) is a nationally-recognized, voluntary certification program developed through the collaborative effort of the public sector and the agriculture industry to ensure high standards for crop advisers. It is intended for anyone who makes nutrient, pesticide, crop, or environmental recommendations to producers including dealers, distributors, applicators, consultants, manufacturers, allied industries, and state and federal agency personnel. The CCA program is administered by state boards in association with the American Society of Agronomy, which handles similar programs for specialists in agronomy, crop consulting, weed science, and other agricultural disciplines. In Michigan, the Michigan Agri-Business Association manages the program.

NOTE: APPENDICES ARE PROVIDED FOR INFORMATION PURPOSES.

APPENDIX I

REFERENCES ON STATE AND FEDERAL LAWS AND REGULATIONS

State and Federal Laws and Regulations: A person applying agricultural pesticides in Michigan must comply with all relevant state and federal laws and regulations. These include, but are not limited to:

1. The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) of 1947, as amended. This is the basic federal law regulating pesticide registration and use in the United States. A new part of this law requires states to implement a state management plan for specific pesticides that may contaminate groundwater. Pesticide applicators are required to adhere to state components of this plan.
2. Federal Worker Protection Standard of 1992. This regulation was written by U.S. Environmental Protection Agency (EPA) governing the protection of employees on farms, forests, nurseries, and greenhouses from occupational exposures to agricultural pesticides. They are intended to reduce the risk of pesticide poisoning and injuries among agricultural workers and pesticide handlers through appropriate exposure reduction measures. The regulations expand the requirements for insuring warnings about pesticide applications, use of personal protective equipment, and restriction on entry to treated areas. New requirements are added for decontamination, emergency assistance, maintaining contact with handlers of highly toxic pesticides, and pesticide safety training.
3. Federal Record Keeping. Authorized by the 1990 Federal Food, Agriculture, Conservation and Trade Act (Farm Bill), new requirements are being developed for record keeping of federally restricted use pesticides (RUP) by certified applicators.
4. The Superfund Amendments and Reauthorization Act (SARA) of 1986 Title III: Emergency Planning and Community Right-to-Know. This federal law provides mechanisms to prepare for chemical emergencies. Persons storing pesticides that are considered to be extremely hazardous by EPA above "Threshold Planning Quantities", must notify the State Emergency Response Commission within MDEQ, the Local Emergency Planning Committee and the local fire chief that they store at least one of these chemicals above threshold at some time. The location of the storage facility and name and telephone number of a responsible person must be reported also. If there is a spill or release of one of these chemicals above the "Reportable Quantity", the same organizations must be notified. MSU Extension Bulletin E-2575 contains information to help farmers comply with the law.

5. The Endangered Species Act (ESA) of 1973, as amended. This federal law protects endangered species and their habitats from the adverse effects of pesticides. Pesticide labels will contain information on endangered species and restricted use areas.
6. National Fire Prevention Association (NFPA) Code 395. The Michigan State Fire Marshall has adopted the NFPA Code 395, which regulates the storage of combustible and flammable liquid chemicals with a flash point below 200° F on the farm. If you construct a new chemical storage facility, contact your local building inspector to be sure you are in compliance with the code's construction, diking, and location requirements. The code sets requirements for the amount and location of stored chemicals; the type, construction and size of containers and fire prevention devices that need to be incorporated into structures.
7. The Natural Resources and Environmental Protection Act, PA 451 of 1994, as amended.
 - a. Part 31, Water Resources Protection (formerly PA 245 of 1929, the Michigan Water Resources Commission Act, as amended). This part provides broad substantive bases for protection and conservation of surface and groundwater resources of the state.
 - b. Part 55, Air Pollution Control (formerly PA 348 of 1965, Air Pollution Control, as amended). MDEQ has statutory authority, powers, duties, functions, and responsibilities for rule making and issuance of permits and orders for air pollution control including burning of pesticide containers. The Part provides for control of air pollution that may be in the form of a dust, fumes, gas, mist, odor, smoke, or vapor, in quantities that are or can become injurious to human health or welfare, animal life, plant life, or to property, or that interfere with the enjoyment of life or property.
 - c. Part 83, Pesticide Control (formerly PA 171 of 1976, Michigan Pesticide Control Act, as amended). This part regulates registration, distribution, labeling, storage, disposal, and application of pesticides in Michigan. The Act was amended in 1993 to allow MDARD to respond to incidents of confirmed groundwater contamination.

Applicator Certification Regulation 636 and Pesticide Use Regulation 637 were established as a requirement of Part 83 Pesticide Control, PA 451 of 1994, the Natural Resources and Environmental Protection Act, as amended to provide regulation for pesticide use.
 - d. Part 87, Groundwater and Freshwater Protection (formerly PA 247 of 1993, Michigan Groundwater and Freshwater Protection Act, as amended). This establishes the necessary legal authorities to develop and implement voluntary, proactive management practices for pesticides and fertilizers that are protective of groundwater. The Act provides for

technical assistance, grants, and research and demonstration projects that will be available to agricultural producers so they can change current practices that may be impacting groundwater. The Act also establishes a statewide advisory committee and regional groundwater stewardship teams that will work directly with producers.

- e. Part 111, Hazardous Waste Management (formerly PA 64 of 1979, the Hazardous Waste Management Act, as amended). This part protects public health and the natural resources of the state from harmful effects of hazardous wastes. When pesticides are not used according to label directions, are out of condition, or are suspended or canceled, they may become hazardous wastes and have strict transportation, treatment, storage, and disposal requirements. This also includes pesticide containers that are not triple rinsed or power washed.
 - f. Part 115 Solid Waste Management (formerly PA 641 of 1978, the Michigan Solid Waste Management Act, as amended). This part provides for proper design and licensing of non-hazardous landfills and provides disposal requirements for various types of wastes. It lists over 60 approved licensed landfills that can accept properly rinsed pesticide containers. The MDEQ Environmental Resource Management Division number is (517) 373-2730.
 - g. Part 201, Environmental Response (formerly PA 307 of 1982, the Environmental Response Act, as amended). This part provides for the identification, risk assessment, and priority evaluation of environmental contamination and provides for response activity at certain facilities and sites. This Act also provides an exemption from liability for farmers if they follow the pesticide label and Generally Accepted Agricultural and Management Practices. Any spills or discharges of polluting material (including pesticides) that may potentially reach any surface or ground water must be controlled and reported to the MDARD's Pollution Emergency Hot Line at (800)-405-0101, or the MDEQ's PEAS at (800) 292-4706.
8. PA 154 of 1974, the Michigan Occupational Safety and Health Act (MIOSHA), as amended. The Michigan Department of Community Health and Michigan Department of Labor and Economic Growth jointly enforce this law to protect workers who handle or during normal working conditions might be exposed to pesticides. Employers are required to develop and implement a written employee training program as well as insure that all pesticides or other hazardous chemical containers are properly labeled. For hazardous chemicals other than pesticides, the employer is required to have Material Safety Data Sheets available for employee review. In case of pesticide, labeling information may be furnished if Material Safety Data Sheets are unavailable. Copies of Material Safety Data Sheets for pesticides are normally available from pesticide manufacturers or distributors. Additionally, farmers are advised to cooperate with

their local fire department and local emergency planning committees in furnishing requested information.

9. PA 399 of 1976, the State of Michigan Safe Drinking Water Act, as amended. An Act to protect the public health; to provide for supervision and control over public water supplies; to provide for the classification of public water supplies; and to provide for continuous, adequate operation of privately owned, public water supplies. This act sets forth standard isolation distances from any existing or potential sources of contamination and regulates the location of public water supplies with respect to major sources of contamination.
10. PA 368 of 1978, the Michigan Public Health Code, as amended. An Act to protect and promote the public health; to codify, revise, consolidate, classify, and add to the laws relating to public health; to provide for the prevention and control of diseases and disabilities; and to provide for the classification, administration, regulation, financing, and maintenance of personal, environmental, and other health services and activities.

APPENDIX II

REFERENCES ON AGENCY RECOMMENDATIONS

Michigan State University pesticide use and pest control recommendations are contained in, but not limited to, the following publications and computer programs available from the MSU Educational Materials Distribution Center at <http://www.emdc.msue.msu.edu/> or by calling (517) 353-6740 or from the local MSU Extension office:

- E-0154 Michigan Fruit Management Guide
- E-0312 Insect, disease, and nematode control for commercial vegetables
- E-0434 Weed control guide for field crops
<http://www.emdc.msue.msu.edu/Bulletin/PDF/E0434.pdf>
- E-0433 Weed control guide for vegetable crops
<http://www.emdc.msue.msu.edu/Bulletin/PDF/E0433.pdf>
- E-1582 Insect, nematode and disease control in Michigan field crops.
- E-2178 Chemical Control of Insects, Diseases, Weeds and Nematodes for Commercial Turf Managers
<http://www.emdc.msue.msu.edu/Bulletin/PDF/E2178.pdf>
- E-2676 Christmas Tree Pests Manual
- NCR-251 Effective Herbicide Use on Christmas Tree Plantations
- NCR 521 Control of Diseases on Commercial Greenhouse Crops
- E-2696 Insect Control for the Greenhouse Industry – Poster
<http://www.emdc.msue.msu.edu/Bulletin/PDF/E2696.pdf>

MSU Extension bulletins and other resources relevant to these Generally Accepted Agricultural and Management Practices can be obtained through the MSU Educational Materials Distribution Center at this Web site <http://www.emdc.msue.msu.edu/> or from the local MSU Extension office.

- E-2182 Reading a Pesticide Label (English and Spanish)
<http://www.emdc.msue.msu.edu/Bulletin/PDF/E2182.pdf>
- E-2575 Emergency Planning for the Farm
<http://www.emdc.msue.msu.edu/Bulletin/PDF/E2575.pdf>

E-2195 Pesticide applicator core training manual: certification, recertification, and registered technician training
<http://www.pested.msu.edu/Resources/bulletins/E2195.html>

E-2215 Using Pesticides Safely: A Guide for the Applicator

E-2335 On-Farm Agrichemical Storage and Handling

E-2784 Safe Transport, Storage, and Disposal of Pesticides

Useful USDA. Natural Resources Conservation Service publications include:

Technical Guide 595-Pest Management Standard

Agrichemical Containment Facility Practice 702

Useful Worker Protection Standard Publications include:

The Worker Protection Standard for Agricultural Pesticides - How to Comply, What Employers Need to Know

Protect Yourself From Pesticides - Guide for Agricultural Workers

Protect Yourself From Pesticides - Guide for Pesticide Handlers

Protect Yourself From Pesticides - Safety Poster

Protect Yourself from Pesticides: Safety Training for Agricultural Workers - Flip Chart

Pesticide Handlers and the Worker Protection Standard: EPA-Approved Pesticide Safety Training for Your Pesticide Handlers. Available in English and Spanish. VT 048-EN, VT 048-SP.

Pesticide Safety for You and Your Family's Health. EPA-Approved Pesticide Safety Training for Your Workers. Available in English and Spanish. VT 046-EN, VT 046-SP.

These may be available at the MDARD office, local MSU Extension office, or at the EPA National Agricultural Compliance Assistance Center located at 901 North 5th Street, Kansas City, KS 66101, (888) 663-2155, Web site: www.epa.gov/agricultureagcenter@epa.gov.

Web-site for MSUE Bulletins: <http://www.bookstore.msue.msu.edu>

REVIEW COMMITTEE

Listed below is the committee to make the annual review for the Generally Accepted Agricultural and Management Practices for Pesticide Utilization and Pest Control.

Dr. Larry Olsen-Chair
Entomology Department
Michigan State University
18B Food Safety &
Toxicology
East Lansing, MI 48824
517-355-8421
olsenl@msu.edu

Randy Ettema
DuPont Crop Protection
9 Sunburst Court
Frankenmuth, MI 48734
989-652-3739
randall.j.ettema@usa.dupont.com

Dr. Mary Hausbeck
Michigan State University
Plant Pathology Department
140 Plant Biology Lab
East Lansing, MI 48824
517-355-4534
hausbec1@msu.edu

Jack Knorek
Michigan Department of
Agriculture & Rural Development
P.O. Box 30017
Lansing, MI 48909
517-335-2874
knorekj@michigan.gov

Dr. Dale Mutch
Kellogg Biological Station
5700 East Gull Lake Drive
Hickory Corners, MI 49060
269-671-2412
mutchd@msu.edu

Terri Novak
Michigan Department of
Environmental Quality,
Agricultural Pollution
Prevention Program
P.O. Box 30457
Lansing, MI 48909
517-241-8526
novaktl@michigan.gov

Dr. Don Penner
Michigan State University
Crop & Soil Sciences
470 Plant & Soil Sciences
Building
East Lansing, MI 48824
517-355-0271 ext. 1227
pennerd@msu.edu

Scott Piggott
Michigan Farm Bureau
7373 West Saginaw
P.O. Box 30960
Lansing, MI 48917
517-323-7000 ext. 2021
spiggot@michfb.com

Brian Rowe
Michigan Department of
Agriculture & Rural Development
P.O. Box 30017
Lansing, MI 48909
517-373-4905
roweb@michigan.gov

Dr. Ruth Shaffer
USDA-NRCS
3001 Coolidge Road,
Suite 250
East Lansing, MI 48823
517-324-5239
ruth.shaffer@mi.usda.gov

Dr. Kurt Thelen
Michigan State University
480 Crop & Soil Sciences
Building
East Lansing, MI 48824
517- 355-0271 ext. 1232
thelenk3@msu.edu

Dr. Bernard Zandstra
Michigan State University
Department of Horticulture
A440 Plant & Soil Science
East Lansing, MI 48824
517-353-6637
zandstra@msu.edu