

Exam Knowledge Expectations for Qualified Applicator Certificate & Qualified Applicator License M – Non-Soil Fumigation Category

Use these knowledge expectations (KEs) to help study the suggested material, *Non-Soil Fumigation, A Pesticide Applicator Study Manual* (2023). Knowing the information from all of the KEs should prepare you for taking the examination.

Chapter 1. Fumigant Basics

- A. Explain what a fumigant is and specify what makes fumigants different from other pesticides.
- B. Explain how fumigants change from a liquid or a solid into a gas.
- C. Outline the chemical characteristics of fumigants.
- D. Describe and explain the factors that affect movement of fumigants through an application site.
- E. List the common fumigants used for non-soil fumigation.
- F. Describe the characteristics of common fumigants used for non-soil fumigation.
- G. Discuss the importance of accurate pest identification.
- H. Explain pest factors that determine use of fumigation as a control method.
- I. Explain the importance of choosing the proper application rate and timing of application.

Chapter 2. Fumigant Labels and Fumigant Handling

- A. Describe the importance of a pesticide label and its legal implications for an applicator.
- B. Define the terms “label” and “labeling.”
- C. Describe fumigant-specific information found on the label.
- D. Outline the procedures for transporting fumigants.
- E. Describe the proper storage of fumigants.
- F. Describe how to respond to fumigant spills, leaks, exposure, or accidents.
- G. Explain how to safely dispose of leftover fumigant and fumigant containers.

Chapter 3. Planning for a Fumigation

- A. Describe factors to consider when selecting an application method to use for a particular site.
- B. Explain the importance, and outline the process of, inspecting the application site prior to fumigation.
- C. List and explain how certain site characteristics and environmental factors can impact a fumigation.
- D. Explain why label statements may limit applications when conditions are unfavorable.
- E. Understand how to calculate the amount of product required for a treatment area.
- F. Describe how to determine area and volume of a structure to be fumigated.
- G. Explain the importance of sealing a fumigation site.
- H. List the methods used to seal an area for fumigation.
- I. List the two main reasons for air monitoring of fumigant levels.
- J. Explain when, where, and how to take air samples.
- K. Discuss why proper calibration of your monitoring equipment is important.
- L. Compare and contrast equipment you might use to monitor site fumigant levels.
- M. Explain when and how to notify authorities about a fumigation.

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Chapter 4. Fumigation Safety

- A. Explain how applicators and others (handlers, bystanders) may be exposed to fumigants.
- B. Describe common mistakes that lead to direct exposure to fumigants.
- C. Describe the concerns, signs, and symptoms of human exposure to fumigants.
- D. List measures you can take to minimize exposure to fumigants.
- E. Outline first aid measures to take if someone is exposed to a fumigant.
- F. Describe when and where to take air monitoring samples.
- G. Explain the fumigant air concentrations that require handlers and applicators to wear respirators.
- H. Describe actions to take when an applicator experiences sensory irritation from a fumigant.
- I. Describe situations when handlers and workers must leave the work area entirely.
- J. Specify who should and should not be present in areas being fumigated.
- K. Specify who should and should not be present during aeration of a site.
- L. Define the two types of buffer zones and how to determine their size.
- M. Specify who is permitted to be in a buffer zone.
- N. Explain the requirements on posting warning signs.
- O. Explain the importance of posting treated sites, who must comply with posting, and who is responsible for posting.
- P. Explain a Fumigation Management Plan (FMP), its importance, and when it is required.
- Q. List and describe the elements of an FMP and resources that can help you prepare it.
- R. Specify who is responsible for verifying the accuracy of the FMP.
- S. Explain how long you must keep an FMP on file, where to keep the plan, and who must have access to it.
- T. Describe the purpose of a Post-Application Summary (PAS) and describe its elements.
- U. Specify who must prepare the PAS and when it must be completed.

Chapter 5. Personal Protective Equipment

- A. Explain the importance of following label directions for personal protective equipment (PPE).
- B. List the PPE needed for fumigation.
- C. Compare and contrast PPE for different kinds of non-soil fumigants.
- D. Explain how to properly use PPE.
- E. Describe the different types of respirators used in fumigations. Compare these respirators to other respirators that are not designed for use in fumigations.
- F. Explain the requirements for replacing respirator cartridges or canisters.
- G. Explain the importance of a medical evaluation before using respirators.
- H. Explain when the use of a self-contained breathing apparatus (SCBA) is indicated and how to use it.

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Chapter 6. Fumigation Methods and Application Equipment

- A. Describe the application methods and equipment commonly used for non-soil fumigation.
- B. Discuss the possible compatibility concerns for fumigants and application equipment, including tanks, hoses, and tubing.
- C. Describe how rate of air exchange, temperature, and sorption/desorption affect aeration time.
- D. Define half-loss time and load factor.
- E. Describe the basic procedures and precautions for aerating a fumigation chamber, a sealed building, or a tarpaulin fumigation.
- F. Discuss what to do when there is an equipment failure.

Chapter 7.1. Chamber Fumigation

- A. Describe the uses of chamber fumigation.
- B. List any specialized equipment needed for a chamber fumigation.
- C. List potential pests you can control through chamber fumigation.
- D. Explain any unique label requirements for chamber fumigation.

Chapter 7.2. Commodity, Post-Harvest, and Quarantine Fumigation

- A. Describe the uses of commodity and post-harvest fumigation.
- B. List any specialized equipment you need.
- C. Briefly outline potential pests you can control.
- D. Explain any unique label requirements for commodity and post-harvest fumigation.

Chapter 7.3. Burrow Fumigation for Vertebrates

- A. List any specialized equipment you need for burrow fumigations.
- B. Briefly outline potential pests you can control with burrow fumigations.
- C. Know the advantages and disadvantages of burrow fumigations.
- D. Explain any unique label requirements for burrow fumigation.

Chapter 7.4. Fumigation of Certain Structures

- A. Describe the uses of structural fumigation.
- B. List any specialized equipment you need for structural fumigations.
- C. Briefly outline potential pests you can control.
- D. Explain any unique label requirements for structural fumigation.

Chapter 7.5. Spot Fumigation

- A. Describe the uses of spot fumigation.
- B. List any specialized equipment you need for conducting spot fumigations.
- C. Briefly outline potential pests you can control with spot fumigation.
- D. Explain any unique label requirements for spot fumigation.

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Chapter 7.6. Fumigation of Transport Vehicles, Containers, and Ships

- A. Describe the uses of fumigation for transport vehicles, etc.
- B. List any specialized equipment you need to fumigate transport vehicles, etc.
- C. Briefly outline potential pests you can control by fumigating transport vehicles, etc.
- D. Explain any unique label requirements for vehicle and ship fumigation.

Chapter 7.7. Sewer Line Root Control

- A. Describe the problems roots can cause in sewer pipes.
- B. Explain the characteristics of roots and how they enter sewer pipes.
- C. Identify control strategies and formulations used for root control.
- D. Describe the PPE you need to wear when performing root control applications.
- E. Explain the basic application techniques and methods for root control in sewer pipes.
- F. Explain concerns with root control applications.
- G. Explain how to determine the effectiveness of root control management.

Chapter 7.8. Sanitizing Wooden Wine Barrels and Wine Bottle Corks

- A. Describe the purpose of sanitizing wine barrels and corks.
- B. Explain fumigation procedures to sanitize wine barrels and corks.
- C. Describe the formulation commonly used for sanitization of wine barrels and corks.
- D. Describe the PPE and air monitoring requirements related to fumigating wooden wine barrels and wine bottle corks.

Chapter 7.9. Remedial Wood Protection

- A. Differentiate between a) Sapwood and Heartwood and b) Softwood and Hardwood.
- B. List wood-destroying pests.
- C. Explain the purpose of remedial wood fumigations.
- D. Identify the fumigants used for remedial wood protection/preservation.
- E. Explain the application techniques and methods for remedial wood protection/preservation.
- F. Explain the environmental and public health concerns with remedial wood applications.
- G. Describe the factors that may influence the effectiveness of remedial wood treatment.

Chapter 8.1. Termites

- A. Discuss the importance of distinguishing between termites and ants.
- B. Describe the three types of termites and the termite life cycle.
- C. List the fumigants used to control termites.
- D. Discuss pest factors that influence the suitability of fumigation as a control method for termites.

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Chapter 8.2. Wood-Boring Beetles

- A. Discuss the importance of properly identifying the species of wood-boring beetle prior to control.
- B. List the three groups of wood-boring beetles and how to differentiate between the groups.
- C. List and discuss the pest factors that influence the suitability of fumigation as a control method for wood-boring beetles.

Chapter 8.3. Stored Commodity Pests

- A. Discuss the importance of accurately identifying stored commodity pests.
- B. Identify important stored commodity pests.
- C. Differentiate between primary and secondary feeders.
- D. Discuss the economic significance of stored commodity pests.
- E. List and discuss the pest factors that influence the suitability of fumigation as a control method for stored commodity pests.

Chapter 8.4. Miscellaneous Pests

- A. Discuss the importance of proper pest identification of rodents and microorganisms.
- B. Discuss management options for rodents and microorganisms.