Exam Knowledge Expectations for
Qualified Applicator Certificate & Qualified Applicator License
J – Demonstration and Research Category

Use these knowledge expectations (KEs) to help study the suggested material,
Demonstration and Research Uses of Pesticides **(2003 Edition)**
Knowing the information from all of the KEs should prepare you for taking the exam.

Chapter 1 Laws and Regulations

A. List some research uses of pesticides.
B. Explain how research on genetically modified crops is treated in California.
C. Describe the purpose of the California Research Authorization program.
D. Describe the situations in which
   a. you must obtain a California Research Authorization
   b. you would be exempt from obtaining a California Research Authorization
E. Distinguish between pesticide uses that are and are not in conflict with the label.
F. List the steps necessary to complete a California Research Authorization.
G. Describe the regulations that apply to the experimental unregistered use of pesticides.
H. List the acreage limitations under a California Research Authorization.
I. Describe the requirement to destroy crops treated with certain experimental pesticides and list the methods used to destroy a variety of crops.
J. Explain when residue testing might be necessary when conducting experiments.
K. List the types of notification you must provide to the local county agricultural commissioner when working under an approved California Research Authorization.
L. Explain the requirements to fill out and submit Experimental Trial Reports and Experimental Pesticide Use Reports.
M. Describe the posting requirements when using pesticides in various research situations.
N. List the protective clothing required when using experimental compounds whose toxicity has not been fully evaluated.
O. Explain the safety precautions to take when handling experimental pesticides.
P. List the situations in which you are exempt from obtaining a restricted-use permit.
Q. Describe the federal Experimental Use Permit (EUP).
R. Explain the requirement to obtain a federal EUP, and the restrictions that apply to the experimental use of pesticides under an EUP.

Chapter 2 Research Experiments and Demonstrations

A. Define the two demonstration types and the situations that are best suited to each type.
B. Describe the goal of research experiments.
C. List the steps necessary to conduct a research experiment.
D. Explain how to design an experiment to test a hypothesis objectively.
E. Define terms and concepts that are fundamental to successfully setting up, conducting, and analyzing research experiments.

Exam Knowledge Expectations for
Qualified Applicator Certificate & Qualified Applicator License
J – Demonstration and Research Category

Use these knowledge expectations (KEs) to help study the suggested material,
Demonstration and Research Uses of Pesticides **(2003 Edition)**
Knowing the information from all of the KEs should prepare you for taking the exam.

F. Describe the two main sources of experimental error.
G. List some of the characteristics that can vary among experimental units that are receiving treatment.
H. Explain how to avoid and prevent errors in experimental designs and while conducting experiments.
I. Explain how blocking helps increase an experiment's validity.
J. Describe procedures that help ensure treatment effects are measured in an unbiased way.
K. Explain why check or control plots are important when conducting field research.
L. Explain why replication is important when conducting research experiments.
M. Explain why randomization is important when conducting research experiments.
N. List the types of experimental designs typically used in field experiments.
O. Describe the factors that influence a researcher's choice of experimental design.
P. Explain how to collect data from a research experiment.
Q. Describe various sampling procedures used to collect data.
R. Describe Federal Insecticide Fungicide Rodenticide Act's (FIFRA) Good Laboratory Practice provisions.
S. Define key terms related to the Good Laboratory Practice standards.

Chapter 3 Making Teaching Effective

A. Explain the importance of understanding the target audience.
B. Describe the learning preferences of adults.
C. List and describe the steps necessary to build effective curriculum for adult learners.
D. Define performance objectives and explain what they should do.
E. Describe how to create effective handouts.
F. List methods for keeping your knowledge of pesticide application methods, safety, and appropriate uses up to date.
G. Explain how to create a good teaching environment.
H. List various teaching methods and explain the advantages and disadvantages of each.
I. Explain how to incorporate hands-on activities and role-play into a demonstration.
J. Explain how visual aids can help make a demonstration more effective.
K. Describe methods used to evaluate the effectiveness of a teaching program.

Chapter 4 Protecting People and the Environment

A. Explain why health and safety hazards must be considered before making a pesticide application.
B. Describe how people get exposed to pesticides.

Exam Knowledge Expectations for
Qualified Applicator Certificate & Qualified Applicator License
J – Demonstration and Research Category

Use these knowledge expectations (KEs) to help study the suggested material,
Demonstration and Research Uses of Pesticides **(2003 Edition)**
Knowing the information from all of the KEs should prepare you for taking the exam.

C. Describe the ways pesticides can enter the body.
D. Describe common symptoms of pesticide exposure in people.
E. List the symptoms of heat stress.
F. Describe ways that pesticides can impact nontarget organisms.
G. Explain how pesticides get into groundwater and surface water.
H. Describe ways to reduce the impact of pesticides on the environment.
I. Describe procedures, additives, formulation types, and conditions that help keep pesticides on target.
J. Describe the things researchers must do to ensure pesticides are handled safely.
K. List the steps necessary to measure and mix pesticides properly.
L. Explain how to triple-rinse empty pesticide containers and how to dispose of them properly.
M. Describe required steps to take to help protect fieldworkers from pesticide exposure.
N. Identify the ways in which applicators can help protect the public from pesticide exposure.
O. Describe the proper weather conditions for the safe application of pesticides.
P. Explain how to dispose of excess materials properly and legally.
Q. Explain why it is important to clean application equipment after use, and list proper sites for cleaning.
R. List the steps to take to ensure proper personal hygiene after handling pesticides.
S. Describe where to find information about first aid for a person involved in a pesticide incident and explain what to do if
    a. you get pesticides on your clothing
    b. you get pesticides in your eyes
    c. you inhale pesticides
    d. you swallow pesticides
T. Describe how to respond to the misapplication of pesticides.
U. Describe what to do when faced with a pesticide leak or spill.
V. Describe what to do when faced with a pesticide fire.
W. Describe the liabilities associated with pesticide applications.

Chapter 5 Application Equipment

A. List the types of application equipment and describe the advantages and limitations of each type.
B. List the types of application equipment used to apply dust or granular pesticides, and describe the situations in which each should be used.
C. Explain the importance of thoroughly checking all components of application equipment before operating the equipment.

Exam Knowledge Expectations for
Qualified Applicator Certificate & Qualified Applicator License
J – Demonstration and Research Category

Use these knowledge expectations (KEs) to help study the suggested material,
Demonstration and Research Uses of Pesticides **(2003 Edition)**
Knowing the information from all of the KEs should prepare you for taking the exam.

D. Explain why accurate calibration is essential to safe, effective pest control.

E. Describe how to calibrate liquid sprayers, and be able to calculate speed, gallons/minute (for low and high pressure sprayers), and nozzle output using formulas.

F. Calculate the amount of pesticide active ingredient or product to apply to a known area.

G. List the steps necessary to calibrate dust and granule application equipment.

H. Make the calculations needed to create a pesticide mixture of a certain percentage of active ingredient.

I. Explain how to mix pesticides on a parts-per-million basis.