

Farmer Skill and Knowledge Checklist: What Maine Farmers Need to Know about Pesticides

Developed by Kerry Bernard, Pesticide Safety Education Professional, University of Maine Cooperative Extension and Richard Brzozowski, Program Administrator, University of Maine Cooperative Extension.

This checklist is a guide to the types of skills and knowledge necessary for farmers and farm workers who use or will use pesticides on crops. Increasing your level of knowledge and skill in pesticide use can help you:

- Keep yourself and others safe by minimizing pesticide exposure
- Achieve better and more economical pest control
- Prevent chemical damage to crops
- Avoid fines and lawsuits

If you're just starting out, don't be intimidated by this list; just make sure you give yourself enough time to learn proper use and handling of pesticides and earn the appropriate license before making applications. If you're a licensed and experienced applicator, remember you can always learn more. Stay diligent, keep your pesticide knowledge fresh, and don't let your certification(s) lapse.

Circle your current and desired (target) competence using this scale:

- 1=No knowledge/skill
2=Some knowledge/skill
3=Well-informed/experienced

Recommended knowledge	My current level			My target level		
Licensing						
Know which type of applicator's license makes sense for your operation.	1	2	3	1	2	3
Be able to obtain core certification and any appropriate category certification(s).	1	2	3	1	2	3
Know how to maintain certification through continuing education.	1	2	3	1	2	3
Pest Management						
Know how to implement an integrated pest management (IPM) plan.	1	2	3	1	2	3
Be able to recognize beneficial organisms.	1	2	3	1	2	3
Be able to identify common pests and diseases in your crop(s).	1	2	3	1	2	3

Know how to get help identifying uncommon pests and diseases.	1	2	3	1	2	3
Understand the lifecycles and disease transmission cycles of common pests.	1	2	3	1	2	3
Know how to avoid preventable pest and disease problems.	1	2	3	1	2	3
Know how to monitor pests through scouting and the use of traps.	1	2	3	1	2	3
Be familiar with the economic thresholds for your crop(s).	1	2	3	1	2	3
Know how to utilize cultural, mechanical, and biological controls.	1	2	3	1	2	3
Understand how to time applications for optimal effectiveness.	1	2	3	1	2	3
Label						
Be able to read and interpret pesticide labels.	1	2	3	1	2	3
Know when to check the pesticide label (before purchase, storage, use, disposal).	1	2	3	1	2	3
Be able to determine if the pesticide is labeled for how you intend to use it.	1	2	3	1	2	3
Be able to determine what personal protective equipment (PPE) is necessary when handling the product.	1	2	3	1	2	3
Be able to determine (and calculate) the proper application rate of a product for the crop.	1	2	3	1	2	3
Be able to determine the proper application frequency of a product for the crop.						
Be able to determine how close to harvest you can apply a product to the crop.	1	2	3	1	2	3
Product selection						
For an organic farm, know which types of products are permitted.	1	2	3	1	2	3
Be familiar with different formulations, their advantages and disadvantages.	1	2	3	1	2	3
Be able to determine the approximate amount of product needed.	1	2	3	1	2	3
Know how to select products for pesticide resistance management.	1	2	3	1	2	3
Understand how product selection can affect next year's crop (plant back times).	1	2	3	1	2	3
Equipment						
Be able to determine what equipment is best for a given pesticide application.	1	2	3	1	2	3
Know how to inspect and repair/replace the parts of a sprayer.	1	2	3	1	2	3
Understand how boom height and configuration affects crop coverage.	1	2	3	1	2	3
Understand how nozzle type affects coverage and application rates.	1	2	3	1	2	3
Know how to identify a worn or clogged nozzle.	1	2	3	1	2	3
Know how to unclog a nozzle safely and without damaging it.	1	2	3	1	2	3
Understand how pump pressure affects coverage and application rates.	1	2	3	1	2	3
Understand how sprayer speed affects coverage and application rates.	1	2	3	1	2	3
Be able to clean equipment thoroughly and safely.	1	2	3	1	2	3
Know how to best store equipment over the winter.	1	2	3	1	2	3
Calibration						
Know when and how to calibrate equipment.	1	2	3	1	2	3
Be able to calculate how much area is to be treated.	1	2	3	1	2	3
Be able to calculate how much area one tank of spray mix will treat.	1	2	3	1	2	3

Be able to calculate how much product to add to the spray tank.	1	2	3	1	2	3
Mixing						
Be able to mix pesticides without sloshing, spilling, and excessive exposure.	1	2	3	1	2	3
Know how to check for compatibility if combining products for an application.	1	2	3	1	2	3
Know the proper order for adding chemicals to the mix tank.	1	2	3	1	2	3
Understand how adjuvants can affect the safety and effectiveness of pesticides.	1	2	3	1	2	3
Understand how adding chemicals can impact a product's phytotoxicity.	1	2	3	1	2	3
Risk						
Understand that risk is a function of toxicity multiplied by exposure.	1	2	3	1	2	3
Understand what the signal words on pesticide products denote.	1	2	3	1	2	3
Know how to minimize pesticide exposure.	1	2	3	1	2	3
Understand that ALL pesticides have risks, even botanicals and biopesticides.	1	2	3	1	2	3
Safety						
Understand how to choose and wear PPE correctly.	1	2	3	1	2	3
Know what type(s) of respirator(s) you can use and how to perform a fit check.	1	2	3	1	2	3
Know how to inspect, maintain, clean, and store PPE, including respirators.	1	2	3	1	2	3
Understand how pesticides enter the body.	1	2	3	1	2	3
Know the difference between acute toxicity and the chronic effects of pesticides.	1	2	3	1	2	3
Be able to recognize the symptoms of pesticide related illness.	1	2	3	1	2	3
Be able to distinguish between pesticide related illness and heat stress.	1	2	3	1	2	3
Know what to do in the event of pesticide related illness or injury.	1	2	3	1	2	3
Understand restricted entry intervals (REI) and know how to adhere to them.	1	2	3	1	2	3
Understand cross-contamination and how to avoid it with pesticides.	1	2	3	1	2	3
Know how to prevent leaks, spills, and exposures during pesticide transport.	1	2	3	1	2	3
Know how to prevent leaks, breakdown, and unauthorized access during storage.	1	2	3	1	2	3
Be prepared for a spill, and know what to do and to whom to report it to if one occurs.	1	2	3	1	2	3
Regulations						
Understand how pesticide rules and regulations apply to you.	1	2	3	1	2	3
Understand and be able to comply with the Worker Protection Standard (WPS).	1	2	3	1	2	3
Understand what if any obligations you have to notify neighbors of applications.	1	2	3	1	2	3
Be able to keep full and accurate records of every application for two years.	1	2	3	1	2	3
Recognize the label as a legal document. THE LABEL IS THE LAW!	1	2	3	1	2	3
Understand the regulations protecting water quality and follow them.	1	2	3	1	2	3
Recognize the special restrictions on products with the Environmental Protection Agency (EPA) bee advisory box.	1	2	3	1	2	3
Understand the concept of drift and how to minimize it.	1	2	3	1	2	3
Be aware of the consequences of drift (illness, lawsuits, fines, damages, etc.).	1	2	3	1	2	3

Be able to recognize and map out sensitive areas to avoid during applications.	1	2	3	1	2	3
Understand how droplet size impacts drift.	1	2	3	1	2	3
Know what wind conditions are acceptable during applications.	1	2	3	1	2	3
Be able to recognize signs of an inversion.	1	2	3	1	2	3
Be prepared for visits from Board of Pesticides Control inspectors.	1	2	3	1	2	3

Resources for Applicators:

- Maine Board of Pesticides Control – thinkfirstspraylast.org, pesticides@maine.gov, 207.287.2731
- NPIC – npic.orst.edu, npic@ace.orst.edu, 800.858.7378
- U.S. EPA – epa.gov/pesticides, pesticidequestions@epa.gov
- Pesticide Educational Resources Collaborative (PERC) – pesticideresources.org
- University of Maine Cooperative Extension
 - extension.umaine.edu/ipm/pesticide-safety
 - kerry.bernard@maine.edu
 - 207.581.3884
 - *Pesticide Education (Core) Manual: A Guide To Proper Use And Handling*, University of Maine, 2015

Pesticide safety information may change over time. This information is provided for educational purposes only and was published 5/2019.

Although pesticides can be an essential tool in pest management, the improper use and disposal of these chemicals present a continuing risk to humans, animals, and the environment. It's important for applicators to understand that becoming certified is about more than just protecting themselves—it's also about protecting our domestic and wild animals, environment, our landscapes, and our communities.

Misuse of pesticides can result in, or contribute to, serious injury, illness, or death. Cooperative Extension does not guarantee the safety or effectiveness of any product or practice. Users of any pesticides, and Extension's educational materials, do so at their sole risk and assume all risk from using such pesticides and materials, whether they follow recommendations or not. The user bears all responsibility for resulting damages to property, human health, or the environment. Cooperative Extension and the University of Maine System shall not be responsible for any damages, INCLUDING, BUT NOT LIMITED TO, ANY AND ALL DAMAGE OR LOSS TO REAL OR PERSONAL PROPERTY, PERSONAL INJURY OR DEATH, RESULTING FROM THE NEGLIGENCE OF COOPERATIVE EXTENSION, THE UNIVERSITY, ITS TRUSTEES, FACULTY, AGENTS, EMPLOYEES OR VOLUNTEERS.

Always follow directions on pesticide labels! Failure to do so violates federal law. Application timing and proper calibration are as important as using the right product. Cooperative Extension makes no warranty or guarantee of any kind, expressed or implied, concerning the use of any pesticide product or practice.

Information in this publication is provided purely for educational purposes. No responsibility is assumed for any problems associated with the use of products or services mentioned. No endorsement of products or companies is intended, nor is criticism of unnamed products or companies implied.

© 2019

Call 800.287.0274 (in Maine), or 207.581.3188, for information on publications and program offerings from University of Maine Cooperative Extension, or visit extension.umaine.edu

The University of Maine is an EEO/AA employer, and does not discriminate on the grounds of race, color, religion, sex, sexual orientation, transgender status, gender expression, national origin, citizenship status, age, disability, genetic information or veteran's status in employment, education, and all other programs and activities. The following person has been designated to handle inquiries regarding non-discrimination policies: Sarah E. Harebo, Director of Equal Opportunity, 101 North Stevens Hall, University of Maine, Orono, ME 04469-5754, 207.581.1226, TTY 711 (Maine Relay System).