ALABAMA COOPERATIVE Extension SYSTEM
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ALABAMA A&M AND AUBURN UNIVERSITIES

Home Application of Fungicides

Nothing can be more frustrating to a gardener or homeowner than trying to determine the proper rate of fungicide to apply for disease control in a vegetable garden, on ornamentals, or on the lawn. Fungicide labels can be confusing, and they often do not indicate the amount of fungicide needed to mix smaller quantities.

This is particularly true of labels on larger fungicide containers, which provide rates on a per-acre basis. These recommendations aren't very useful to the gardener or homeowner who wishes to make only a gallon or two of spray mixture to treat a few plants or a small lawn.

The purpose of this publication is to teach homeowners how to calibrate small sprayers and to convert rates for large quantities to rates appropriate for home application. This publication includes three tables that will assist you in these conversions.

Table 1 converts wettable powder and liquid fungicide formulations from a per-acre or 100-gallon basis to teaspoons or tablespoons per gallon. In this table, wettable powder and other dry formulations are calculated to quantities required per gallon, weighed, and converted into a volumetric measurement of level teaspoons and tablespoons.

In examining Table 1, you may notice that wettable powders and dry formulations differ in density and bulk. For example, to make a 1-gallon quantity equivalent to 2 pounds per 100 gallons, it takes 1½ tablespoons of 3336 50 WG but only 1 level tablespoon of Maneb 80WG.

Liquid formulations are converted directly from larger rates to volumetric measurements of teaspoons and tablespoons.

Table 2 converts the amount of fungicide needed per acre to the amount needed for 1,000 square feet, which is the unit size most frequently used for determining fungicide rates for home lawns or turf. In this table, no distinction is made for differences in the weight of various wettable powder formulations.

Table 3 is a liquid conversion table. It provides a guide for converting from one liquid measure to another.

Small Sprayers

There are several types of sprayers for use on lawns, vegetable gardens, shrubs, and small fruit trees.

Small pump-up sprayers are the most common type of sprayer used around the home. Most pump-up sprayers are hand-held, although some can be strapped to the shoulder or the back. They are inexpensive and are excellent for spot-treating small areas in the lawn, small shrubs, and small vegetable gardens. Most of these sprayers have a single nozzle, but some backpack sprayers may also have a boom with two or three nozzles for treating lawns.

The major disadvantage of small pump-up sprayers is their limited spray volume capacity (only 1 to 3 gallons). This makes them unsuitable for spraying large areas.

Hose-end proportioner-sprayers are essentially quart-size jars equipped with a nozzle that attaches to the end of a water hose. Pesticides are added to the container and are metered out by water pressure. This sprayer puts out a lot of water compared to the quantity of pesticide expelled, so it is ideal for applying insecticides that require a substantial quantity of water to move them into the soil. Hose-end proportioners are not suited for applying foliar fungicides.

Manual, ground-driven "estate" sprayers are designed primarily to apply herbicides, but they are also good for applying fungicides and insecticides to the lawn. These sprayers usually have pneumatic tires and a boom with two or three nozzles. The tank capacity for these sprayers is usually 5 to 6 gallons. This type of sprayer is pulled or pushed manually, and the pump is ground-driven.

Table 1. Conversion From Rate-Per-Acre to Rate-Per-Gallon For Wettable Powder And Liquid Formulations

Fungicide	Rate/100 Gallons or Acre	Rate/Gallon	Application
Aliette T/O	6.4 - 12.8 oz.	1 - 2 t.	drench
Aliette T/O	2 - 5 lb.	2 - 4 T.	spray
Banner Maxx	8 fl. oz.	½ t.	spray
Banol 66.5F	25 fl. oz.	½ T.	drench
Banrot 40WP	6 - 12 oz.	½ - 1¼ t.	drench
Bayleton T/O	2 oz.	⅛ t.	drench
Bravo ULTREX	1.5 lb.	1 T.	spray
Captan 50WP	1 - 2 lb.	¾ - 1½ T.	spray
Chipco 26019 50WP	6 oz.	1 t.	drench
Chipco 26019 50WP	1 - 2 lb.	1 - 2 T.	spray
Cleary's 3336F 4F	10 - 20 fl. oz.	½ - 1¼ t.	spray
Cleary's 3336 50W	12 - 16 oz.	2 - 2½ t.	spray
Cleary's 3336 WP	1 lb.	2½ t.	drench
Daconil Weather Stik 6F	1.5 pt.	1.5 t.	spray
Dithane T/O 80WP	1.5 lb.	2 t.	spray
Fixed copper (48 - 53 %)	1 - 4 lb.	½- 2 T.	spray
Fore 80WP	1½ lb.	1 T.	spray
Heritage 50W	1 - 4 oz.	4 - 16 T.	spray
Junction	1.5 lb.	½ T.	spray
Kocide T/O	0.75 lb.	1 t.	spray
Maneb 80WP	1 - 2 lb.	½ - 1 T.	spray
Protect T/O	1.5 lb.	1 T.	spray
Rubigan AS	6 - 10 fl. oz.	⅓ - ⅔ t.	spray
Subdue MAXX	1 - 2 fl. oz.	3 - 12 drops	drench
Terraguard 50W	4 - 8 oz.	0.7 - 1.3 t.	spray
Thiram 75WP	1 - 2 lb.	¾ - 1½ T.	drench
Truban 30WP	3 - 10 oz.	¾ - 1½ t.	drench
Truban 25EC	4 - 8 fl. oz.	¼ - ½ t.	drench
Wettable sulfur 95%	1 - 2 lb.	½ - 1 T.	drench

Key: fl. oz. = fluid ounce; lb. = pound; T. = level tablespoon; t. = level teaspoon.

Estate or ground-driven sprayers provide excellent spray distribution. The major disadvantage is that they are heavy and difficult to operate on hilly terrain.

Small power sprayers are ideal for larger gardens or for orchards with medium-size fruit trees. These sprayers, powered by electric motors or gasoline engines, have a spray capacity of 15 to 50 gallons, so you must pull them with a small tractor. Small power sprayers can provide better coverage of larger fruit trees and cover larger areas faster than manual sprayers.

The major disadvantage to these power sprayers is that they are usually too expensive and require too much maintenance for most homeowners.

Calibrating Sprayers

Small sprayers for vegetable gardens, small trees, and ornamentals. Using this method, fungicides are mixed in a known volume of water. Because all of the plants' exposed surfaces are sprayed to the point of runoff, it is assumed that 100 gallons of spray mixture covers one acre. If the label recommends a given amount of fungicide on a per-acre basis, then that amount would be mixed in 100 gallons of water.

For example, the Maneb 80WP label recommends 2 pounds per acre, which means that 2 pounds of Maneb 80WP would be mixed in 100 gallons of water. To make 1 gallon of spray mixture, add 0.02 pound (½ tablespoon) of Maneb to 1 gallon of water.

Most homeowners do not have scales that can accurately measure such small quantities, so volumetric equivalents in tablespoons (T.) or in teaspoons (t.) for many of the commonly used fungicides are provided in Table 1. The wettable powders in this table have been weighed out and converted into either teaspoon or tablespoon volumetric measurements.

Small lawn sprayers. To calibrate a lawn sprayer, first determine the amount of spray to be delivered over a small area. Most fungicides for lawns are recom-

mended in a given amount per 1,000 square feet, so the easiest method is to calibrate the sprayer over a 1,000-square-foot area. You can determine the amount of spray delivered per 1,000 square feet by following these steps.

1. For a sprayer with a boom, first determine the effective swath width. Keeping the boom level and at a constant height above the surface, spray a bare area (such as your driveway) with water. This allows you to see the spray pattern easily. Measure the width of the spray pattern. This is the effective swath width.

For a sprayer with a single nozzle, determine the effective swath width by moving the spray nozzle from side to side. Adjust your walking speed, so that the entire swath is covered with solid spray pattern. The distance across the spray pattern in feet is the effective swath width.

Table 2. Conversion Of Rate-Per-Acre To Rate-Per-100-Feet and Rate-Per-1,000-Feet For Wettable Powder And Liquid Formulations

Rate Per Acre	Rate Per 100 Square Feet	Rate Per 1,000 Square Feet
	Wettable Powders	
1 lb.	¼ t.	2½ t.
2 lb.	½ t.	5 t.
3 lb.	¾ t.	2¼ T.
4 lb.	1 t.	3 T.
5 lb.	1¼ t.	4 T.
6 lb.	1½ t.	4½ T.
8 lb.	1¾ t.	⅔ c.
10 lb.	2 t.	½ c.
50 lb.	3⅓ T.	1⅛ lb.
100 lb.	¼ lb.	2¼ lb.
	Liquids	
1 c.	⅛ t.	1 t.
1 pt.	¼ t.	¾ T.
1 qt.	½ t.	1½ T.
1 gal.	2 t.	6 T.
25 gal.	1 c.	4½ pt.
50 gal.	1 pt.	4½ qt.
75 gal.	1½ pt.	1¾ gal.
100 gal.	1 qt.	2¼ gal.

NOTE: Dry formulations vary in bulk and density; therefore, the amounts given for wettable powders are estimates of the volume required. Since such small volumes and areas are involved, these estimates should be adequate.

Key: c. = cup; fl. oz. = fluid ounce; gal. = gallon; lb. = pound; pt. = pint; qt. = quart; T. = level tablespoon; t. = level teaspoon

2. To find the distance the sprayer must travel, divide 1,000 by the effective swath width in feet. Because the distance is usually more than 100 feet, you may need to make several passes.

Example: If the effective swath width of the sprayer measures 5 feet, divide 1,000 by 5. The answer is 200 feet, which is the distance the sprayer must travel to cover an area of 1,000 square feet. (Note: If there is not enough available space to mark off 200 feet, measure off a shorter distance such as 100 feet and travel the distance two times.)

3. To check the volume of spray delivered, first mark off the course and fill the sprayer with a known quantity of water. With the sprayer operating at the desired spray pressure, walk at a constant speed over the measured distance. When you're finished, measure the amount of water required to refill the tank to its original level. This is the volume of spray delivered per 1,000 square feet.

4. To obtain the desired application rate, mix the recommended amount of fungicide with the volume of spray it took to cover the 1,000 square feet. Think about this example: it took 2½ gallons of water to refill your tank to its original level after spraying a 200-foot course, and the label recommends 3 fluid ounces of Manzate 200DF per 1,000 square feet. Therefore, you would add 3 fluid ounces of Manzate 200DF for each 2½ gallons of water you add to the spray tank.

Table 3. Conversion Table For Liquids

1 fl. oz. = 30 cubic centimeters
1 fl. oz. = 2 T. or 6 t.
8 fl. oz. = 16 T. or 1 c.
16 fl. oz. = 1 pt. or 2 c.
32 fl. oz. = 1 qt. or 2 pt.
128 fl. oz. = 1 gal. or 4 qt.
1 gal. of water weighs 8.34 lb.
1 gal. of kerosene weighs 6.7 lb.
1 gal. of fuel oil weighs 7.2 lb.

Key: c. = cup; fl. oz. = fluid ounce; gal. = gallon; lb. = pound;pt. = pint; qt. = quart; T. = level tablespoon; t. = level teaspoon

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