tanbir86plp@gmail.com

Fungicide and Nematicide rate and dosage calculations

Fungicides for use in sprays are generally available as wettable or soluble powders and as liquid concentrates. These must be diluted, usually with water, before use. Other diluents, such as deodorized kerosene, may be used for special applications. Dusts and granules are applied without dilution.

The amount of active ingredient in liquid concentrates is expressed in pounds per gallon. In granules, dusts, wettable or soluble powders, andother solids it is nearly always expressed as percent by weight. Application rates are usually expressed as amount of pesticide product but sometimesthey may be expressed as pounds of active ingredient or actual toxicant. Actual toxicant and active ingredient are practically synonymous.

Conversion:

1 hectare = 107,639.10 Square Feet/ ~107,640 ft^2 = 10,000 Square meter=2.47 acre = 7.47 bigha

1 acre = 43560 ft^2 = 4046.86 m^2/ ~4047m^2 = 0.405 ha = 100 decimal =3.025bigha

1 bigha = 33.33 decimal = 1338 m^2 = 0.333 acre

1 decimal = 436 sq. feet = 40.5 sq. meter

1 bigha = 0.33 acre (33 decimal)

1 Kilogram = 1000 gram = 2.205 pound

1 ounce = 28.35 g (say 29 g)

1 Liter = 1000 ml

1 gallon = 4.5 lit = 8.36 pound

1 kilometer (km) = 0.62 mile

1 sq. meter = 10.76 sq. feet

10 lakh = 1 million

1 lakh = 0.1 million

1 core = 10 million

1 ppm = 1 part per one million

1 ppt = 1 part per one thousand

1 ppm = 1 ug/mL = 1 mg/L

1 kg/L = 1000000 mg/L

1% = 1/100

1ppm = 1/1000000

1ppm = 0.0001%

1% =10000ppm

1 g/100ml = 1%

Parts per million (ppm): This is a way of expressing very dilute concentrations of substances. Just as per cent means out of a hundred, so parts per million or ppm means out of a million. Usually describes the concentration of something in water or soil. One ppm is equivalent to 1 milligram of something per liter of water (mg/l) or 1 milligram of something per kilogram soil (mg/kg).

Formula:

1. Total Spray Volume = Area x Rate of Application
2. Correction Factor = 100/a. i (Active Ingredient)
3. $V_1S_1 = V_2S_2$(V = volume, S = Concentration)
4. Amount of fungicide (Kg) = {Conc. (ppm)x Total Spray Volume (L) x Correction Factor }/1000000

   OR, Amount of fungicide (Kg) = (% a. i Desired conc. x Desired volume)/% a. i in formulated fungicide
5. Dust/Granule required (Kg/ha) = (Recommended rate a. i x Area x 100)/ % a. i in formulation
6. Area of spay per minute (m^2/min) = spray swath x walking speed
7. Application rate per hectare = (Nozzle discharge x Area)/ Area sprayed per minute
8. Number of spray load/hectare = Application rate per hectare/ Tank capacity

1. A farmer sprayed 3 times of his 10 ha crop field with 20 ppm Bavistin 50 WP solution @ 250 gallon/ha. Calculate the amount of fungicide.

Solution:

Here,

Total Spray Volume = Area x Rate of Application

= 10x250 = 2500 gallons =11250 L

Correction Factor = 100/a. i (Active Ingredient)

= 100/50 = 2

We know,

Amount of fungicide (Kg) = {Concentration (ppm) x Total Spray Volume (L) x Correction Factor}/1000000

= 20x11250x2/1000000

= 0.45 Kg = 450 g

For, one time needed 450 g fungicide

So that, for 3 times needed = 450 x 3= 1350 g = 1.35 kg (Ans.)

2. How much ROVRAL® 50 % WP will be required to prepare 0.05% conc. for 3 L solution?

Solution:

Here,

% a. i desired conc. = 0.05

Desired volume = 3L

% a. i in formulated fungicide = 50

We know,

Amount of ROVRAL® 50 % WP (Kg) = (% a. i desired conc. x desired volume)/ % a. i in formulated fungicide

= 0.05 x 3/50

= 0.003 Kg

= 3 g (Ans.)

OR,

Here,

Correction Factor (C.F) = 100/a. i (Active Ingredient)

= 100/50 = 2

Concentration 0.05% = 500 ppm

Total Spray Volume = 3 L

We know,

Amount of ROVRAL® 50 % WP (Kg) = {Concentration (ppm) x Total Spray Volume (L) x Correction Factor}/1000000

= 500x3x2/1000000 = 0.003 Kg = 3 g (Ans.)

3. How much amount of water will be required to prepare 4% conc. for 5 L solution from 40%conc. formaldehyde?

Solution:

Here,

$V_1 = 5$ L, $S_1 = 4$

$V_2 = ?$ $S_2 = 40$

We know, $V_1S_1 = V_2S_2$

$V_2 = V_1S_1/ S_2$

$= 5X4/40 = 0.5$ L

Required amount of water = 5-0.5 = 4.5 L. (Ans.)

4. How will you prepare 250 ppm conc. for 2 L solution from Rovral 50 WP?

Solution:

Here,

Total Spray Volume = 2 L

Correction Factor = 100/50 = 2

We know,

Amount of Rovral (Kg) = {Conc. (ppm) x Total Spray Volume (L) x Correction Factor}/1000000

= 250x2x2/1000000

= 0.001 Kg = 1 g(Ans.)

5. Convert 3% Radomil to ppm concentration

Solution:

We know, 1% =10000ppm

3% Radomil = 30000 ppm (Ans.)

OR,

1 g/100ml = 1%

3% Radomil = 3 g/100ml

= 30 g/1000ml

= 30000 mg/1000ml

= 30000 ppm (1 ppm = 1 mg/L) (Ans.)

6. Convert 30 ppm Rovral to % concentration

Solution:

We know, 1ppm = 0.0001%

30 ppm = 0.003 %(Ans.)

OR,

30 ppm = 30 mg/1000ml

= 3 mg/100ml

= 0.003 g/100ml(1 g/100ml = 1%)

= 0.003 % (Ans.)

7. Control of Nematode calls for the application of 1.0 kg a. i/ha. If carbofuran3G is to be applied, how much needed for 0.75 ha?

Here,

Recommended rate a.i area = 1.0 kg a.i/ha

Area to be treated = 0.75 ha

% a.i in formulation = 3

We know,

Granule required (Kg/ha) = (Recommended rate a. I x Area x100)/ % a. i in formulation

= 1x 0.75x100/3

= 25 Kg(Ans.)

8. To walk in the paddy field and operate the sprayer with a spray swath of 1 m, a farmer covered 25 m/min., suppose the nozzle discharge was 0.5 L/min and tank capacity was 20 L. What is the application rate and number of spray load/ha?

Solution:

Here,

Spray swath = 1m and Walking speed = 25 m/min.

Nozzle discharge = 0.5L and Area = 1 ha = 10,000 m^2

We know,

Area of spay per minute (m^2/min) = spray swath x walking speed

= 1 m x 25 m/min = 25 m^2/min

Application rate per ha = (Nozzle discharge x Area)/ Area sprayed per minute

= 0.5 x 10000/25

= 200 L(Ans.)

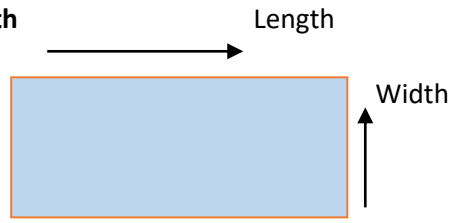
Number of spray load/ha = Application rate per ha/ Tank capacity

= 200/20

=10times (Ans.)

Calculating Area:

Rectangle Area: Area =Length x Width



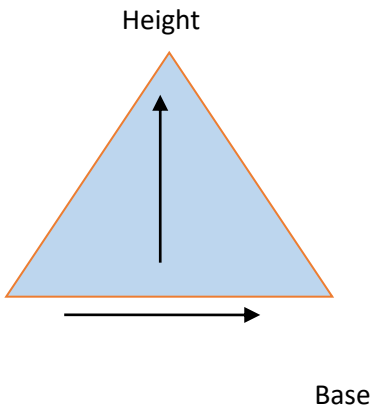
Example:

Length = 1320 ft.

Width = 120 ft.

We know, Rectangle Area =Length x Width = 1320 x 120 = 158 400 sq. ft. = 3.64 acre.

Triangle Area: Base x Height /2



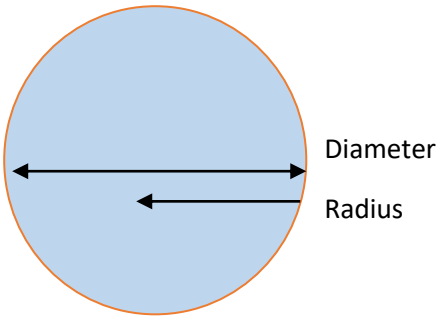
Example:

Base = 325 ft.

Height = 150 ft.

We know, Triangle Area: Base x Height /2 = 325 x 150/2 = 24375 sq. ft. = 0.56 acre.

Circle Area: πr^2



Example:

Diameter = 90 ft.

Radius = 45 ft.

We know, Circle Area: $\pi r^2 = 3.14 \times 45^2 = 6358.5$ sq. ft. = 0.15 acre.