
Section 21

Applying the Right Amount of Pesticide

Pesticide Rate

For the most effective pest control, you must:

- ▶ choose the right pesticide
- ▶ apply it at the right time
- ▶ apply the right amount of pesticide.

The amount of pesticide applied per unit of area or per plant is known as the **pesticide rate**.

The label on each pesticide product tells you the pesticide rate for specific pests on specific crops (or on livestock, if that is how you use pesticides).

Remember that a pesticide label is a legal document. You must follow the directions exactly – so read the label carefully.

- ▶ You must use the product **only** for the pests and the crops (or livestock) listed on the label.
- ▶ You must use the pesticide rate shown on the label.

Why worry about the amount of pesticide you use?

If you use too much pesticide, it may damage your crops, or cause damage to other plants or animals.

The extra pesticide may stay on the plants as residue, or run off into the soil. If you use too little pesticide, the treatment may not be effective.

Be sure that your application equipment will do the job correctly. It must apply the pesticide evenly over the whole crop at the pesticide rate shown on the label. ◀ Review the **Application Equipment** section in this manual for more information on how to calculate the output of equipment.

Calculate How Much Pesticide to Use for Spray Mix Applications

Once you have decided on a pesticide and know the pesticide rate, the next step is to calculate how much pesticide to use. You need to know how much pesticide and carrier to add to each tank and the amount of pesticide you need for the whole area.

This section reviews the different ways that pesticide rate is described, and tells you how to calculate the amount of pesticide and spray mix you need.

You will learn how to answer the following questions:

1. How large is the area you need to spray?
2. How much pesticide will you need to spray the area?
3. How much area can you spray with one **full** tank?
4. How much pesticide should you add to one **full** tank?
5. After you spray the full tank(s), how much area is left to spray?
6. How much pesticide should you add to the **part** tank to finish spraying the field?
7. How much spray mix (pesticide plus water) will you need for the **part** tank to finish spraying the field?

This section will show you how to do the mathematics to answer these questions. We will go step by step through each one of the examples to show you how to make the calculations. A pocket calculator will make it easier and faster.

Remember that you also need to know the sprayer output of the application equipment. ◀ Review the **Application Equipment** section in this manual if you have any questions.

How to Calculate the Amount of Pesticide You Need

1. How large is the area you need to spray?

- ▶ Multiply the length of the field by the width.
- ▶ **If you are using metres**, divide this number by 10,000 – the number of m² in a hectare. This gives you the number of hectares (ha).

$$\text{ha} = \frac{\text{length (m)} \times \text{width (m)}}{10,000 \text{ m}^2/\text{ha}}$$

- ▶ **If you are using feet**, divide the number by 43,560 – the number of ft² in an acre. This gives you the number of acres.

$$\text{acres} = \frac{\text{length (ft)} \times \text{width (ft)}}{43,560 \text{ ft}^2/\text{acre}}$$

2. How much pesticide will you need to spray the area?

What is the pesticide rate?

In Canada, labels give the pesticide rate in litres per hectare (L/ha), or kilograms per hectare (kg/ha).

- ▶ **If you measure the area of your fields in hectares**, you can use the pesticide rate shown on the label.
- ▶ **If you measure the area of your fields in acres**, you will have to change the pesticide rate shown on the label from litres (or kilograms) per hectare to litres (or kilograms) per acre. You can do this by multiplying the rate by 0.4. This changes the rate to litres (or kilograms) per acre.

metric rate (L/ha or kg/ha)	X 0.4 =	pesticide rate for acres (L/acre or kg/acre)
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When you have done the calculations above, and have the pesticide rate, you will be ready to calculate the amount of pesticide you need.

- ▶ Multiply the area you want to spray (Step 1 above) by the pesticide rate.

Litres or kilograms of pesticide you need =

area to spray (**ha**) X pesticide rate (L/ha or kg/ha)
or
 area to spray (**acres**) X pesticide rate (L/acre or kg/acre)

Calculations for a Full Tank

3. How much area can you spray with one full tank?

- ▶ Divide the tank size by the sprayer output. You find the sprayer output by calibrating your sprayer.

$$\frac{\text{tank size (L)}}{\text{sprayer output (L/ha)}} = \text{number of ha one tank will spray}$$

or

$$\frac{\text{tank size (L)}}{\text{sprayer output (L/acre)}} = \text{number of acres one tank will spray}$$

or

$$\frac{\text{tank size (gal)}}{\text{sprayer output (gal/acre)}} = \text{number of acres one tank will spray}$$

(Be sure you know whether your sprayer uses U.S. gallons or Imperial gallons).

4. How much pesticide should you add to one full tank?

Multiply the area sprayed by one tank (Step 3 above) by the pesticide rate you are using.

Litres or kilograms of pesticide to add to a full tank =

area sprayed by one tank (**ha**) X pesticide rate (L/ha or kg/ha)

or

area sprayed by one tank (**acres**) X pesticide rate
(L/acre or kg/acre)

Calculations for a Part Tank

5. How much area is left to spray?

- ▶ Subtract the area you have already sprayed from the total area.

Area left to spray =

total area — area already sprayed

or

total area — (number of tanks X area sprayed by one tank)

6. How much pesticide should you add to the part tank to finish spraying the total area?

- ▶ Multiply the area left to spray by the pesticide rate.

L or kg of pesticide to add to a part tank =

area left to spray (**ha**) X pesticide rate (L/ha or kg/ha)

or

area left to spray (**acre**) X pesticide rate (L/acre or kg/acre)

7. How much spray mix will you need for the part tank to finish spraying the total area?

- ▶ Multiply the area that is left to spray by the sprayer output.

Spray mix needed for a part tank =

area left to spray (**ha**) X sprayer output (L/ha)

or

area left to spray (**acre**) X sprayer output (gal/acre)

Sample Problem 1: Metric measure

You decide to apply pesticide to your crop. The pesticide rate is **3 L/ha**. You calibrate your sprayer and the output is **50 L/ha**. Your spray tank holds **400 L** of spray mix. Your field is **500 m** long and **200 m** wide.

1. How large is the **area** you need to spray?

$$\text{ha} = \frac{\text{length (m)} \times \text{width (m)}}{10,000 \text{ m}^2/\text{ha}} = \frac{500 \text{ m} \times 200 \text{ m}}{10,000 \text{ m}^2/\text{ha}} = 10 \text{ ha}$$

The area you need to spray is 10 ha.

2. How much **pesticide** will you need to spray the area?

The pesticide rate is 3 L/ha.

area to spray X **pesticide rate**

$$10 \text{ ha} \quad \times \quad 3 \text{ L/ha} = 30 \text{ L}$$

You will need 30 L of pesticide.

3. How much **area** can you spray with one **full** tank?

$$\frac{\text{tank size (L)}}{\text{sprayer output (L/ha)}}$$

$$= \frac{400 \text{ L}}{50 \text{ L/ha}}$$

$$= 8 \text{ ha}$$

One full tank sprays 8 ha.

4. How much **pesticide** should you add to one **full** tank?

area sprayed by one tank (ha) X pesticide rate (L/ha)

$$8 \text{ ha} \times 3 \text{ L/ha} = 24 \text{ L}$$

You should add 24 L of pesticide to a full tank.

5. After you spray the full tank, how much **area** is left to spray?

total area - area already sprayed

$$10 \text{ ha} - 8 \text{ ha} = 2 \text{ ha}$$

There are 2 hectares left to spray.

6. How much **pesticide** should you add to the **part** tank to finish spraying the field?

area left to spray (ha) X pesticide rate (L/ha)

$$2 \text{ ha} \times 3 \text{ L/ha} = 6 \text{ L}$$

You should add 6 L of pesticide to the part tank.

7. How much **spray mix** will you need for the **part** tank to finish spraying the field?

area left to spray (ha) X sprayer output (L/ha)

$$2 \text{ ha} \times 50 \text{ L/ha} = 100 \text{ L}$$

You will need 100 L of spray mix for the part tank.

Sample Problem 2: Imperial measure

You decide to apply **2.5 L/ha** of a pesticide to your crop. Your sprayer applies **20 gal/acre**. Your sprayer holds **200 gallons** of spray mix. Your field is **950 feet** long and **825 feet** wide.

1. How large is the area you need to spray?

$$\frac{\text{length (feet)} \times \text{width (feet)}}{43,560 \text{ ft}^2/\text{acre}} = \frac{950 \text{ ft} \times 825 \text{ ft}}{43,560 \text{ ft}^2/\text{acre}} = 17.99 \text{ or } 18 \text{ acres}$$

The area you need to spray is 18 acres.

2. How much **pesticide** will you need to spray the area? When your area is in acres, change the rate from L/ha to L/acre.

$$\text{L/ha} \quad \times \quad 0.4 \quad = \quad \text{L/acre}$$

$$2.5 \text{ L/ha} \quad \times \quad 0.4 \quad = \quad 1 \text{ L/acre}$$

The pesticide rate is 1 L/acre.

$$\text{area to spray} \quad \times \quad \text{pesticide rate}$$

$$18 \text{ acres} \quad \times \quad 1 \text{ L/acre} = 18 \text{ L}$$

You will need 18 L of pesticide.

3. How much area can you spray with one full tank?

$$\frac{\text{tank size (L)}}{\text{sprayer output (L/acre)}}$$

$$= \frac{200 \text{ gal}}{20 \text{ gal/acre}}$$

$$= 10 \text{ acres}$$

One full tank sprays 10 acres.

4. How much **pesticide** should you add to one **full** tank?

area sprayed by one tank (acres) X pesticide rate (L/ha)

$$10 \text{ acres} \times 1 \text{ L/acre} = 10 \text{ L}$$

You should add 10 L of pesticide to a full tank.

5. After you spray the full tank, how much **area** is left to spray?

total area - area already sprayed

$$18 \text{ acres} - 10 \text{ acres} = 8 \text{ acres}$$

There are 8 acres left to spray.

6. How much **pesticide** should you add to the **part** tank to finish spraying the field?

area left to spray (acres) X pesticide rate (L/acres)

$$8 \text{ acres} \times 1 \text{ L/acre} = 8 \text{ L}$$

You should add 8 L of pesticide to the part tank.

7. How much **spray mix** will you need for the **part** tank to finish spraying the field?

area left to spray (acres) X sprayer output (gal/acre)

$$8 \text{ acres} \times 20 \text{ gal/acre} = 160 \text{ gal}$$

You will need 160 gal of spray mix for the part tank.

Calculation for Granular Pesticides

Granular pesticides may be applied as a broadcast treatment (over the whole field) or as a band treatment.

The pesticide rate for granular pesticides is usually given as the amount of product to apply to a specific area.

Broadcast Treatment

For example: The label says to use **60 kg** of granular product per hectare. The field that will be treated is **2.6 ha**. The spreader is adjusted and calibrated so that its output is **60 kg/ha**. The hopper holds **30 kg**. The whole field will be treated (broadcast treatment).

1. Determine how large an area one hopperful will treat.

If you plan to treat a large area, you should first find out the area that can be treated by one hopperful.

- ▶ Calculate the area that one hopperful should cover, by dividing the hopper capacity by the calibrated output. (See below for how to do this).
- ▶ Apply one hopperful, then measure the area that was covered.
- ▶ Compare the actual area covered with your calculations to be sure that it is the same as the pesticide rate recommended on the label.

If the actual area covered is smaller, then you are applying too much pesticide. You are wasting pesticide and may damage your crops.

If the actual area covered is larger, then you are using too little pesticide, and the treatment may not be effective.

How to Calculate the Area One Hopperful Should Cover:

The output may be expressed in several ways. We will use kg/ha first, then do the same calculations if the output is measured in g/100 m².

1a. If the calibrated output is 60 kg/ha

Divide the hopper capacity by the calibrated output.

$$\frac{30 \text{ kg}}{60 \text{ kg/ha}} = 0.5 \text{ ha}$$

One hopperful should cover 0.5 hectare. This area can also be expressed as m². Converting to m² may make it easier to measure a test section.

To convert to m²:

Multiply by 10,000 (the number of m² in a hectare).

$$0.5 \text{ ha} \times 10,000 = 5,000 \text{ m}^2$$

One hopperful should cover 5,000 m².

The test area can be any combination of length and width that multiplies to 5,000 m². (For example, 250 m X 20 m, or 200 m X 25 m).

1b. If the calibrated output is 600 g/100 m²

You must first convert this output to grams per 1 m². Do this by dividing 600 g by 100 m².

$$\text{Output} = \frac{600 \text{ g}}{100 \text{ m}^2} = 6 \text{ g/m}^2$$

Then, divide the hopper capacity (30 kg = 30,000 g) by the calibrated output.

$$\frac{30,000 \text{ g}}{6 \text{ g/m}^2} = 5,000 \text{ m}^2$$

One hopper should cover 5,000 m².

The test area can be any combination of length and width that multiplies to 5,000 m².

2. Determine how much pesticide is required for the total treatment.

Multiply the size of the field by the calibrated output.

$$2.6 \text{ ha} \times 60 \text{ kg/ha} = 156 \text{ kg}$$

You will need 156 kg of pesticide for the total treatment.

3. Determine how many hoppers are required.

Divide the total pesticide required by the capacity of the hopper.

$$\frac{156 \text{ kg}}{30 \text{ kg}} = 5.2 \text{ hoppers}$$

You will use 5 full hoppers and a part one (0.2 or one-fifth).

Calculations for Livestock Applications

Ready to Use Pesticides for Livestock Applications

Ready to use pesticides are convenient. You don't need to mix them with water before you apply them. The pesticide label will tell you how much to apply. The pesticide rate is given as the amount of pesticide to apply in millilitres or litres per animal, based on the weight of the animals in kilograms.

Hint: To work with the weight of the animals in pounds, you must first change the pesticide mixture rate from a rate per kilogram to a rate per pound by multiplying by 0.45.

$\text{millilitres / kilogram} \times 0.45 = \text{millilitres / pound}$
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OR

$\text{millilitres / 100 kilograms} \times 0.45 = \text{millilitres / 100 pounds}$
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You will need to answer these questions:

1. What is the pesticide rate in mL/100 lb?
$$\text{pesticide rate (mL/100 kg)} \times 0.45 = \text{pesticide rate (mL/ 100 lb)}$$
2. How much pesticide will you apply to each animal?
$$\text{pesticide rate (mL/ 100 lb)} \times \text{weight of the animal (lb)} = \text{mL to apply per animal}$$
3. How much pesticide will you need to treat all the animals?
$$\text{mL to apply per animal} \times \text{number of animals to treat} = \text{total amount of pesticide}$$

Sample question:

You need to treat **45 animals** with a Ready-To-Use Insecticide. The average weight of the animals is **400 lb**. The pesticide rate is **20 mL/100 kg** of body weight.

1. What is the pesticide rate in mL/100 lb?
$$20 \text{ mL/100 kg} \times 0.45 = 9 \text{ mL/100 lb}$$
2. How much pesticide will you apply to each 400 lb animal?
$$9 \text{ mL/100 lb} \times 400 \text{ lb} = 36 \text{ mL}$$
3. How much pesticide will you need to treat all 45 animals?
$$36 \text{ mL} \times 45 \text{ animals} = 1,620 \text{ mL or 1.6 L}$$

Calculations for Livestock Applications

Pesticide Mixtures for Livestock Applications

You must apply some livestock pesticides as mixtures. The pesticide label will tell you to mix the pesticide with water (or sometimes with oil) before you apply it to your animals or to the surface areas of your buildings.

The label will tell you the pesticide rate in two steps:

1. **the amount of pesticide to add to water (mixing ratio)**
For example, mL of pesticide per L of water
2. **the amount of mixture that you need to apply to each animal or to an area**
For example, mL of pesticide mixture per kg of body weight, **or**
mL of pesticide mixture per m²

Mixing Ratios

Some labels will state the amount of pesticide you need to add to water as a mixing ratio. For example,

**“Dilute one part Louse Kill with five parts of water and stir vigorously.
One part Louse Kill makes 6 parts of diluted pesticide mixture.”**

This tells you that the mixing ratio is 1 part pesticide + 5 parts water = 6 parts mixture.

The **pesticide** is $\frac{1}{6}$ of the total pesticide mix

The **water** is $\frac{5}{6}$ of the total pesticide mix

Or the label may state,

**“Prepare the spray by mixing 250 millilitres of pesticide in each 10 litres of water.
Use 5 litres of spray to cover 100 square metres.”**

Hint: 1 L = 1000 mL

This tells you that the mixing ratio is 250 parts pesticide + 9,750 parts water
= 10,000 parts mixture.

The **pesticide** is $\frac{250}{10,000}$ of the total pesticide mix

The **water** is $\frac{9,750}{10,000}$ of the total pesticide mix

Calculations for Livestock Applications

Mixing Ratios, continued

Before you prepare a pesticide mixture, you will need to answer these questions:

1. How much **pesticide mixture** will you need to treat all the animals (or area of the buildings)?

$$\begin{array}{r} \text{amount of pesticide mixture} \\ \text{for each animal (or area)} \end{array} \times \begin{array}{r} \text{number of animals to treat} \\ \text{(or area to treat)} \end{array} = \begin{array}{r} \text{amount of} \\ \text{pesticide mixture} \end{array}$$

2. How much **pesticide** will you need to mix?

$$\frac{\text{part to mix of the pesticide}}{\text{total parts of pesticide mixture}} \times \begin{array}{r} \text{total amount of pesticide} \\ \text{mixture you need} \end{array} = \begin{array}{r} \text{amount of pesticide} \end{array}$$

3. How much **water** will you need to mix?

$$\frac{\text{part to mix of the water}}{\text{total parts of pesticide mixture}} \times \begin{array}{r} \text{total amount of pesticide} \\ \text{mixture you need} \end{array} = \begin{array}{r} \text{amount of water} \end{array}$$

Sample question:

You need to spray to control house flies in and around dairy cattle buildings. The total area is **800 m²**. Prepare the amount of spray you need by diluting **100 mL** of Livestock Premise Spray MEC Concentrate **with 3.9 L of water** to make a **total quantity of 4 litres**. Apply to the point of runoff. Four (4) litres of diluted pesticide mixture will treat a 100 square metres of surface.

1. How much **pesticide mixture** will you need to treat the buildings?

$$4 \text{ L}/100 \text{ m}^2 \quad \times \quad 800 \text{ m}^2 \quad = \quad 32 \text{ L}$$

2. How much **pesticide** will you need to mix?

$$\frac{100 \text{ mL}}{4,000 \text{ mL}} \quad \times \quad 32,000 \text{ mL} \quad = \quad 800 \text{ mL}$$

3. How much **water** will you need to mix?

$$\frac{3.9 \text{ L}}{4.0 \text{ L}} \quad \times \quad 32 \text{ L} \quad = \quad 31.2 \text{ L}$$

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Calculations to Find How Much Pesticide and Spray Mix to Use

You will find the following information in the questions:

- ▶ length and width of the field
- ▶ pesticide rate from the label in metric measure
- ▶ size of the spray tank
- ▶ sprayer output

Hint: If you prefer to work in the imperial measures of feet and acres, you must first change the pesticide rate from a rate per hectare to a rate per acre by multiplying by 0.4.

$$\text{Litres/hectare} \times 0.4 = \text{Litres/Acre}$$

1. How large is the **area** you need to spray?

$$\text{Ha} = \frac{\text{Length (m)} \times \text{Width (m)}}{10,000 \text{ m}^2/\text{ha}} \qquad \text{Acres} = \frac{\text{Length (ft)} \times \text{Width (ft)}}{43,560 \text{ ft}^2/\text{acre}}$$

2. How much **pesticide** will you need to spray the area?

$$\text{Area to spray} \times \text{Pesticide Rate}$$

3. How much **area** can you spray with one **full** tank?

$$\frac{\text{Tank Size}}{\text{Sprayer output}}$$

4. How much **pesticide** should you add to one **full** tank?

$$\text{Area sprayed by one tank} \times \text{Pesticide Rate}$$

5. After you spray the full tanks, how much **area** is left to spray?

$$\text{Total area} - \text{Area already sprayed}$$

6. How much **pesticide** should you add to the **part** tank?

$$\text{Area left to spray} \times \text{Pesticide Rate}$$

7. How much **spray mix** (pesticide plus water) will you need for the **part** tank?

$$\text{Area left to spray} \times \text{Sprayer output}$$

Review Questions



Field Sprayer (hectares) - Example 1

You decide to spray your corn field to control the weeds. The pesticide rate is **2 L/ha**. The sprayer holds **1200 L** of spray mix. Your sprayer applies **200 litres of spray mix per hectare**. Your field is **200 m** wide and **500 m** long.

$10,000 \text{ m}^2 = 1 \text{ ha}$

1. How many **hectares** is the field you need to spray?
2. How many litres of **pesticide** will you need to spray the whole field?
3. How many **hectares** can you spray with one **full** tank?
4. How many litres of **pesticide** should you add to one **full** tank?
5. After you spray the full tank, how many **hectares** are left to spray?
6. How many litres of **pesticide** should you add to the **part** tank?
7. How many litres of **spray mix** will you need for the **part** tank?

Field Sprayer (hectares) - Example 2

You decide to spray your soybean field to control the insects. The pesticide rate is **83 mL/ha**. The sprayer holds **900 L** of spray mix. Your sprayer applies **150 litres of spray mix per hectare**. Your field is **200 m** wide and **400 m** long.

$$10,000 \text{ m}^2 = 1 \text{ ha}$$

1. How many **hectares** is the field you need to spray?
2. How many millilitres of **pesticide** will you need to spray the whole field?
3. How many **hectares** can you spray with one **full** tank?
4. How many millilitres of **pesticide** should you add to one **full** tank?
5. After you spray the full tank, how many **hectares** are left to spray?
6. How many millilitres of **pesticide** should you add to the **part** tank?
7. How many litres of **spray mix** will you need for the **part** tank?

Field Sprayer (acres)

You need to spray a field to control the weeds. The pesticide rate is **2 L/ha**. Your sprayer holds **300 gallons** and your sprayer applies **15 gallons of spray mix per acre**. Your field is **1,210 ft** long by **900 ft** wide.

$$1 \text{ acre} = 43,560 \text{ ft}^2$$

$$\text{L/ha} \times 0.4 = \text{L/acre}$$

1. How many acres is the field you need to spray?
2. How many litres of pesticide will you need to spray the whole field?
Remember to change the pesticide rate from L/ha to L/acre.
3. How many acres can you spray with one **full** tank?
4. How many litres of pesticide should you add to a **full** tank?
5. After spraying the full tank, how many acres are left to spray?
6. How many litres of pesticide should you add to the **part** tank?
7. How many gallons of spray mix will you need for the **part** tank?

Greenhouse (square feet, acres)

You need to spray the greenhouse to control insects on the ornamental plants.

The pesticide rate is **1.5 kg per 1,000 litres of water**, which is enough to spray 1 acre. Your spray tank holds **400 litres**. You will spray **7** greenhouses. Each greenhouse is **40 feet by 200 feet**.

$$1 \text{ kg} = 1,000 \text{ g}$$

$$1 \text{ acre} = 43,560 \text{ ft}^2$$

1. How many square feet is the total area you need to spray? How many acres is this?
2. How many kilograms of pesticide will you need to spray the area?
3. How many acres (or square feet) can you spray with one **full** tank?
4. How many kilograms (or grams) of pesticide should you add to one **full** tank?
5. After spraying three (3) full tanks, how many acres (or square feet) are left to spray?
6. How many kilograms (or grams) of pesticide should you add to the **part** tank?
7. How many litres of water should you add to make up the **part** tank of spray mix?

Orchard (acres)

You need to spray an insecticide on your apple trees. The pesticide rate is **2.0 kg/ha**. Your sprayer holds **600 gallons** and your sprayer applies **100 gallons of spray mix per acre**. The area you will spray is **1,400 ft long by 400 ft wide**.

$$1 \text{ acre} = 43,560 \text{ ft}^2$$

$$\text{kg/ha} \times 0.4 = \text{kg/acre}$$

1. How many **acres** is the orchard area you need to spray?
2. How many kilograms of pesticide will you need to spray the orchard?
3. How many acres can you spray with one **full** tank?
4. How many kilograms of pesticide should you add to one **full** tank?
5. After you spray two full tanks, how many acres are left to spray?
6. How many kilograms (or grams) of pesticide should you add to the **part** tank?
7. How many gallons of spray mix will you need for the **part** tank?

Livestock Pour-On

You need to apply “Pour-On Lice Kill” to your beef cattle. You have **80** beef cattle with an average weight of **500 lb**. You must apply the mixture at **64 mL per 100 kg** of body weight of the animals. The pesticide label tells you to prepare a mixture of **one part Pour-On to eight parts water**.

Hint: To work with the weight of the animals in pounds, you must first change the pesticide rate from a rate per kilogram to a rate per pound by multiplying by 0.45.

$$\text{millilitres / 100 kilograms} \times 0.45 = \text{millilitres / 100 pounds}$$

1. How many **millilitres** of the pesticide mix will you need to treat **one animal**?
2. How many **litres** of the pesticide mix will you need to treat **80 animals**?
3. How many litres of **Pour-On Lice Kill** will you need to treat 80 animals?
4. How many litres of **water** will you need to mix to treat 80 animals?

Fly Control in a Barn

You have decided to use an insecticide to control a fly problem in your barn. The area of your barn that you wish to spray is **550 m²**. The label recommends the addition of **200 mL** of insecticide to **10 L** of water. Your backpack sprayer is calibrated to apply **4.5 L** of pesticide solution per **100 m²** and holds **15 L**.

1. How many litres of spray mix (water plus insecticide) do you need to treat the whole area?
2. How many millilitres of insecticide will you need to spray the whole area?
3. How many square metres does one **full** tank cover?
4. How many millilitres of pesticide should you add to one **full** tank?
5. After spraying the first tank, how many square metres are left to spray?
6. How many litres of water should you add to make up the **part** tank?
7. How many millilitres of pesticide should you add to the **part** tank?

Tear and Go Reference Page



Calculations to Find How Much Pesticide and Spray Mix to Use

You will find the following information in the questions:

- ▶ length and width of the field
- ▶ pesticide rate from the label in metric measure
- ▶ size of the spray tank
- ▶ sprayer output

Hint: If you prefer to work in the imperial measures of feet and acres, you must first change the pesticide rate from a rate per hectare to a rate per acre by multiplying by 0.4.

$$\text{Litres/hectare} \times 0.4 = \text{Litres/Acre}$$

1. How large is the **area** you need to spray?

$$\text{Ha} = \frac{\text{Length (m)} \times \text{Width (m)}}{10,000 \text{ m}^2/\text{ha}} \qquad \text{Acres} = \frac{\text{Length (ft)} \times \text{Width (ft)}}{43,560 \text{ ft}^2/\text{acre}}$$

2. How much **pesticide** will you need to spray the area?

$$\text{Area to spray} \times \text{Pesticide Rate}$$

3. How much **area** can you spray with one **full** tank?

$$\frac{\text{Tank Size}}{\text{Sprayer output}}$$

4. How much **pesticide** should you add to one **full** tank?

$$\text{Area sprayed by one tank} \times \text{Pesticide Rate}$$

5. After you spray the full tanks, how much **area** is left to spray?

$$\text{Total area} - \text{Area already sprayed}$$

6. How much **pesticide** should you add to the **part** tank?

$$\text{Area left to spray} \times \text{Pesticide Rate}$$

7. How much **spray mix** (pesticide plus water) will you need for the **part** tank?

$$\text{Area left to spray} \times \text{Sprayer output}$$