

XS1 - SURVEY PROBLEMS

Instructions to trainer: cut out each of the four problems below, and distribute one to each group. Each group should read their problem and the trainer will ask another group to quickly answer it with the first thing that comes to their minds.

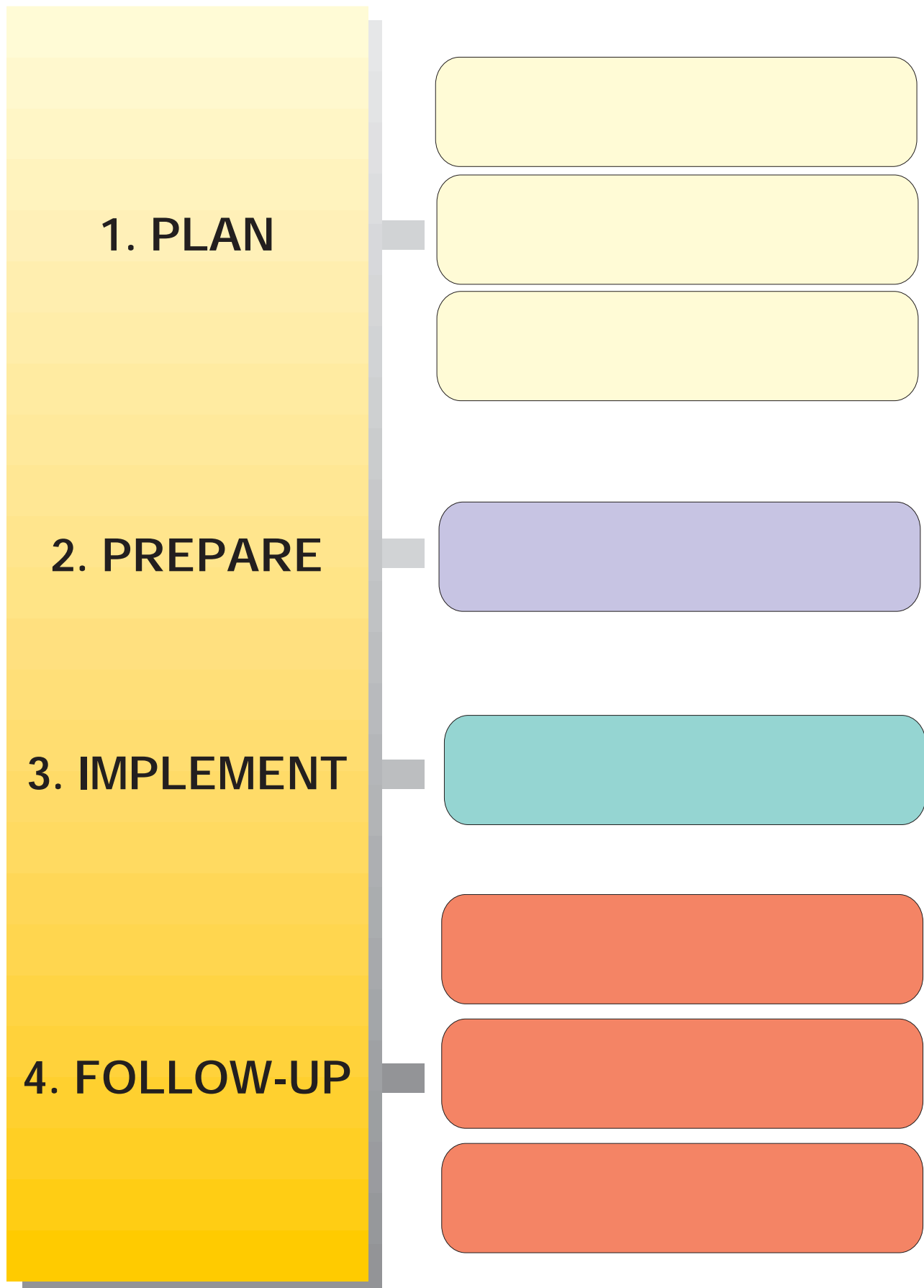
You think that there might have been some rains and maybe some locusts present somewhere but you have no information. What do you do?

You hear on the news that swarms are invading your country. What do you do?

Locals report large locust infestations? What do you do?

You do not think that it has rained or there are any locusts. What do you do?

XS4A - THE SURVEY PROCESS



XS4B - THE SURVEY PROCESS (PIECES FOR THE EXERCISE)

Instructions:

1. make enough photocopies of this sheet, so that each group has a complete set of pieces
2. using scissors, carefully cut out each piece along the outline border
3. distribute one complete set of pieces and a blank Survey Process skeleton to each group
(pieces should be mixed up in random order)
4. ask each group to put the pieces in the correct (or logical) order

Who? Where? When?

Who? Where? When?

**Survey type?
(assessment, search)**

**Survey type?
(assessment, search)**

**Survey method?
(ground, air)**

**Survey method?
(ground, air)**

equipment

equipment

**Collect, record &
transmit data**

**Collect, record &
transmit data**

we found everything?

we found everything?

assessment? search?

assessment? search?

control?

control?

XS6A - ASSESSMENT SURVEY

Introduction

You have received information that there has been recent rainfall in Desert Locust breeding areas in an area of about 200 km by 100 km. You are asked to check the area for green vegetation and locusts.

Please answer the following questions:

1. What time will you make the survey: _____ - _____ AM ; _____ - _____ PM
2. How much time will you spend at each survey stop: _____ minutes
3. What is the total number of survey stops that you hope to make in the morning and in the afternoon: _____ stops

Hint: try the following:

$$\frac{\text{Number of hours spent surveying in one day} \times 60 \text{ minutes} / 1 \text{ hr}}{\text{number of minutes per stop}}$$

4. How many kilometers do you expect to cover in one day: _____ km

Hint: allow for time to travel in between stops and estimate average driving speed

5. About how many days will it take you to assess the vegetation conditions and the locust situation in the area of recent rainfall: _____ days
6. What would you do if you find a hopper band along the way: *circle your choice*
 - a) Stop and search for other bands
 - b) Stop and immediately undertake control
 - c) Make a note and continue your survey

XS6B - ASSESSMENT/SEARCH: HOPPER BANDS

Introduction

When surveying in a vehicle, it is easy to find SOME of the hopper bands in a large infestation, but it is almost impossible to find all of the hopper bands.

Exercise

You have a map showing a coastal region in the Desert Locust recession area. An invisible pen has been used to mark it with a number of hopper bands. The exercise is to use a magic pen to trace an imaginary survey route wherever you like on the map. When the magic pen passes over a marked hopper band, the ink will change colour - you have 'found' a hopper band.

Use the information received from the field (see below) to help guide you where to make your survey. Using the magic pen, you should first **assess** the situation (assessment survey) and then **search** (search survey) for any hopper bands that you think may be present from your assessment survey.

The aim is to find as many hopper bands as you can. However, you cannot simply colour the whole map with the magic pen, you must make a survey over a distance which is realistic to drive in one day - say 150 km. At the scale of this map, this means that you can only draw your survey line for a total length of around 75 cm.

After surveying for an approximate line length of 75 cm (around 150 km), count the number of hopper bands you have found as follows:

Group No. _____	Assessment	Search
Distance surveyed (km)		
Number of bands found		

Information from the field (only use that which refers to your map)

- A. Nomads reported seeing hopper bands south of the coastal road.
- B. Heavy rains fell about one month ago near Habshan where mature swarms were seen.
- C. HQ requests that you check coastal and subcoastal areas.
- D. Swarms were seen laying about four weeks ago south-east of Tarif (port town).

Questions (to think about for the discussion that follows this exercise)

1. If no bands were found during the assessment survey, would you have thought that the area was free of locusts?
2. Why should you make an assessment survey first; why not start searching immediately?
3. When you found your first hopper band, what did you do – looked for others in the same area or continue with your survey?

XS17 - MAP READING EXERCISE*Instructions: Fill in the blanks or circle your answer*

1. What is the scale of this map: _____ .
2. 1 cm = _____ km.
3. Where is north on this map? (top, bottom, left or right side of map)
4. Where is the Yemen/Saudi Arabia border? (top right, top left, bottom right, bottom left, centre)
5. What are the blue polygons, circles and squares : _____ .
6. What are the units of elevation (metres or feet)
7. Where is the latitude scale: (top/bottom or right/left side of map)
8. Where is the longitude scale: (top/bottom or right/left side of map)
9. What colour are roads : _____ rivers : _____ airports : _____
big cities : _____ dry lake beds : _____ sea : _____
10. How are sandy areas indicated : _____ , and dunes : _____ .
11. What is the distance from Jizan airport to Khamis Mushayt airport by air: _____ km.
12. 20 km NW of Ad Da'ir (1720N/4309E) is a _____ with an elevation of : _____ (m or ft).
13. What is the blue and white spotted object about 100 km E of Najran (1730N/4409E) : _____ .
14. What is the object at 160830N/471530E : _____ ;
what is the closest big city : _____ ; and in what direction : _____ .
15. East of Qaryah (194800N/450830E) is : _____ for how many _____ km.
16. What are the coordinates of Jizan : _____ Khamis Mushayt : _____ .
17. What is at 184930N/444730E : _____ .
18. What is at 1747N/4423E : _____ .

19. How are mountains areas indicated on this map : _____ .
20. What is the name of the mountain range between Khamis Mushayt and Jizan :
_____ .
21. What is the elevation of the tallest mountain on the map : _____ (metres or feet) ; in
which country : _____ .
22. What is the name of the river SE of Al Hazm (Al Hazm is 160 km SE of Najran) : _____ ;
is it on the plains or in the mountains (circle your answer) ; what direction does it flow : _____ .
23. What do the very small fine brown lines on the map indicate :
_____ .

XS18 - USING A COMPASS

First exercise

Each group starts outside on the roadside at your red flag near the wall

1. Walk on a bearing of 90 degrees for a distance of 50 paces

Now give the compass to someone else in your group

2. Walk on a bearing of 240 degrees for a distance of 70 paces

Now give the compass to someone else in your group

3. Walk on a bearing of 80 degrees for a distance of 40 paces

Now give the compass to someone else in your group

4. Walk on a bearing of 320 degrees for a distance of 45 paces

Now where are you?

Introduction

One of the most important pieces of information to collect during survey and control is the coordinates of the location of the survey, green vegetation, rainfall, locusts and control operations. The most reliable method of doing this is to use a GPS (geographic positioning system). Every time you carry out survey or control operations, you should take with you a GPS. These are small handheld units that are robust and do not cost very much. Other units are available for mounting in vehicles and aircraft. The actual GPS model may vary in your own country but it is suggested that a country try to standardize on one model if possible because this will make it easier for training.

Exercise

This exercise concentrates on using a handheld GPS, preferably a Garmin 12 or 12XL. With the help of other trainees in your group and the group leader, you should practice the following techniques so that by the end of the exercise you can use them easily. It is suggested that you practice using the GPS after the training sessions but remember to turn it off when you are not using it so that you do not empty the batteries.

Practice the following:

1. Turn on/off
2. Initialize the unit
3. Change the date and time, latitude/longitude format
4. Take a position reading
5. Store the position
6. Recall the stored position
7. Enter, name and store a given latitude/longitude position
8. General care of the unit

XS21 - COMPLETING THE FAO DESERT LOCUST SURVEY AND CONTROL FORM

Introduction

It is easier to record survey results onto a form rather than in narrative format. This will also make it easier for others to use the information for analysis, planning and forecasting.

Exercise

Complete the *FAO Desert Locust Survey and Control Form* using the following locust survey results:

1. Scattered solitary adults at densities of 28 / 200x5 m foot transect were seen in Wadi Hamad (251630N/341222E) on 21 January 2002 in dense green vegetation on 15 ha. Hoppers were last seen here in October 2001.
2. On the same day, a farmer reported 4th and 5th instar hopper bands of medium density on 3 ha of his crops in wet soil mixed with scattered fledglings and immature adults at Bir Ali.
3. On 22 January, two immature dense swarms, varying in size from 1-2 km² were seen flying from east to west at 2610N/3315E. Groups of fledglings were present in green medium dense vegetation; soil was moist and moderate rains fell two weeks ago. Crops are being harvested.
4. On 24 January, no Desert Locust were found at Al-Kamili (271102N/336855E), but vegetation was green and low density, soil was dry and 15 mm of rain fell on 17 January. The survey covered 50 ha. High density grasshoppers present.
5. On 29 January, ground control operations treated eight 4th and 5th instar bands at densities of 10-20 hoppers/m² covering 150 ha. Vegetation was medium density and drying. Soil moisture was dry. The last rains fell about 1 month ago but were heavy. A total of 75 litres of Fenitrothion ULV was used at 0.5 l/ha. After 1 day, about 80% were killed. Bright yellow adults at densities of 9,000 locusts/ha were also seen laying but these were not sprayed.
6. On 30 January, 6 isolated immature adults were seen during a 1 km vehicle transect within an area of medium dense green vegetation of about 2x2 km. A nomad said he saw hoppers in the same area two weeks ago.

Questions (to think about for the discussion that follows this exercise)

1. Was the information in each report complete or was there some items missing?
2. What difficulties did you have when completing the forms?
3. What changes would you like to see to make the forms easier to use?

XS22 - USING ELOCUST

Introduction

FAO and EMPRES has been evaluating a new method to record locust and habitat data collected during field surveys. Rather than completing a form, the field officer enters the data directly into a handheld computer while at the survey location and before moving onto the next stop. The programme is called eLocust.

Exercise

Imagine that you are making a survey and have stopped in some green vegetation in which you have found some locusts. You must record your observations using eLocust.

Each group will enter one sentence of the observations into eLocust:

GROUP 1: location data (date, coordinate, name, area)

GROUP 2: habitat data (habitat, rainfall, vegetation, soil moisture)

GROUP 3: locust data

GROUP 4: control data and comments

We will use the reports from the previous exercise.

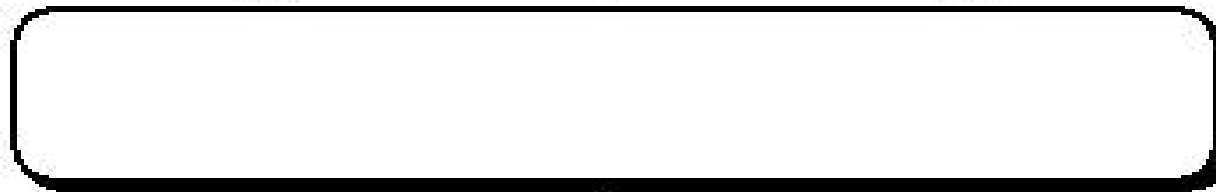
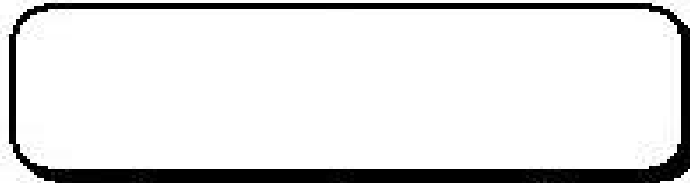
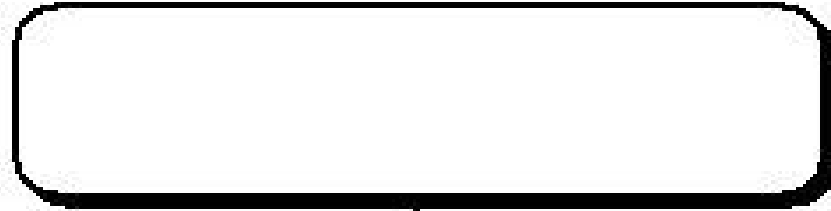
1. 21 January 2002, Wadi Hamad (251630N/341222E), 15 ha. Dense green vegetation. Scattered solitary adults at densities of 28 / 200x5 m foot transect. Hoppers were last seen here in October 2001.
2. 21 January 2002, Bir Ali, 3 ha. Crops, wet soil. 4th and 5th instar hopper bands of medium density mixed with scattered fledglings and immature adults. Reported by a farmer.
3. 22 January 2002, 2610N/3315E. Moderate rains fell two weeks ago, green medium dense vegetation, and moist soil. Two immature dense swarms, varying in size from 1-2 km² were seen flying from east to west, groups of fledglings present. Crops are being harvested.
4. 24 January 2002, Al-Kamili (271102N/336855E), 50 ha. 15 mm of rain fell on 17 January, vegetation is green and low density, soil is dry. No Desert Locust found. High density grasshoppers present.
5. 29 January 2002, 150 ha. The last rains fell about 1 month ago but were heavy, current vegetation is medium density and drying, soil moisture is dry. Eight 4th and 5th instar bands at densities of 10-20 hoppers/m², bright yellow adults at densities of 9,000 locusts/ha were also seen laying. Ground control ops used 75 litres of Fenitrothion ULV at 0.5 l/ha, after 1 day, about 80% were killed. The adults were not sprayed.
6. 30 January 2002, area of about 2x2 km (= 400 ha). Medium dense green vegetation. 6 isolated immature adults were seen during a 1 km vehicle transect. A nomad said he saw hoppers in the same area two weeks ago.

Questions (to think about for the discussion that follows this exercise)

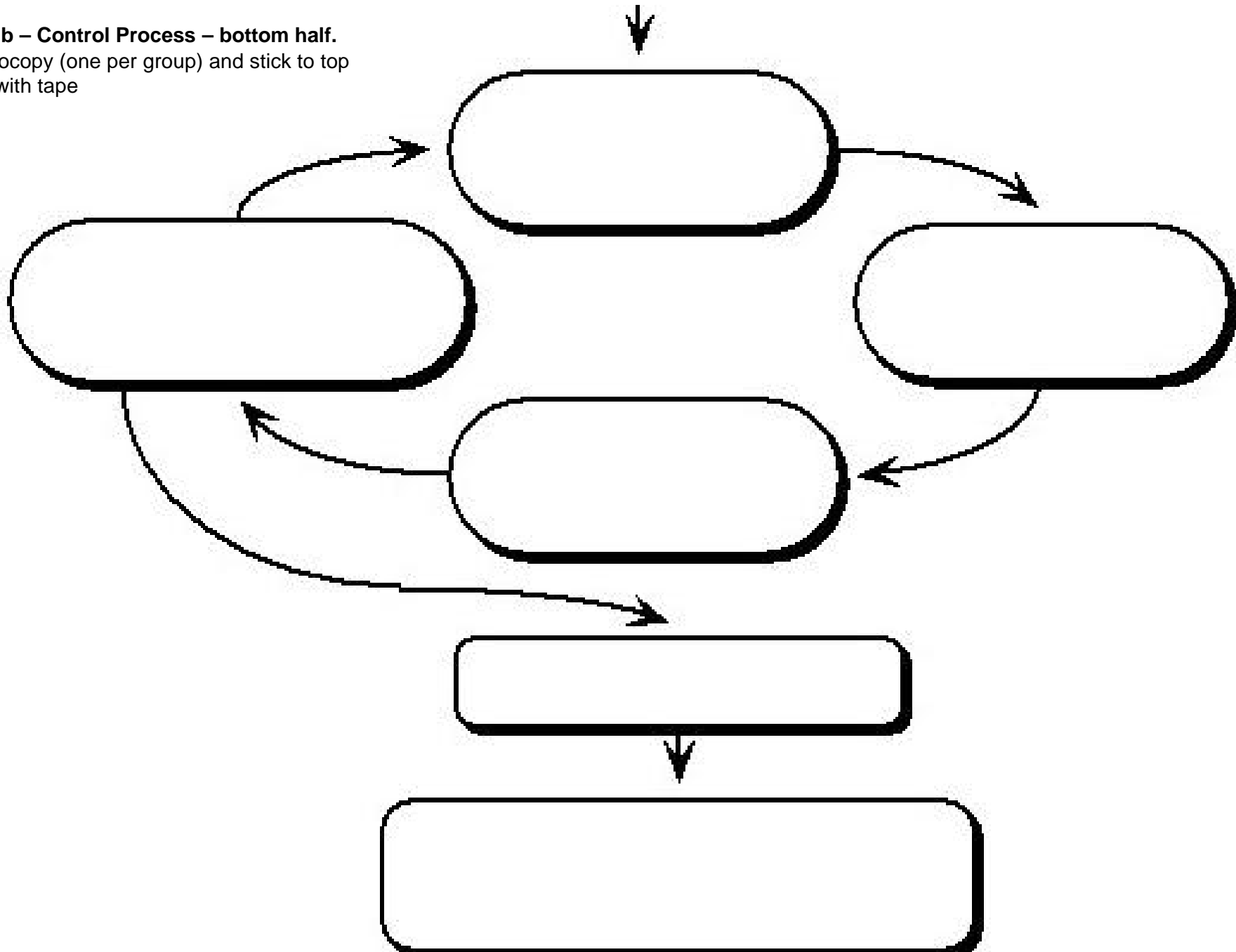
1. Was eLocust easier and faster than entering data on the forms?
2. What difficulties did you have?
3. What changes would you like to see in eLocust to make it easier to use?

XC1 a – Control Process – top half.
Photocopy (one per group) and stick to
bottom half with tape

THE CONTROL PROCESS



XC1 b – Control Process – bottom half.
Photocopy (one per group) and stick to top
half with tape



Find and delimit
the target

Choose an
insecticide

Submit report

Monitor/record
activities/efficacy

Choose application
platform

Control the locusts
safely/efficiently

Choose control
equipment

What is the target and is
control necessary. If so....

Make sure conditions
are right

Clean, maintain and store
equipment/pesticide

Choose a control
technology

Calibrate control equipment and
inform local population

XC2 - EXERCISE ON SUITABLE DROPLET SPECTRA FOR ULV SPRAYING

Exercise

Each group should expose a piece of water sensitive paper to the spray coming from each of the following in turn:

- a. A brush dipped in a bucket then flicked vigorously at the paper
- b. a lever operated knapsack sprayer (hydraulic nozzle)
- c. a 'flit gun' type sprayer (airblast nozzle)
- d. a spinning disc sprayer (eg Micron Ulva plus) fitted with 7 or 8 batteries (rotary atomiser)

Using the hand lenses, examine the size of the droplets (do not worry about the number of droplets on the papers as this will depend how long you held the paper in the spray). Now discuss in your groups and decide on a group answer to the following questions.

Questions

- a. which sprayer produced the largest droplet?
- b. which produced the smallest droplet?
- c. which produced the largest range of droplet sizes (many different sizes of droplets)?
- d. which produced the narrowest range of droplet sizes (most droplets around the same size)?
- e. which is likely to be the most suitable for ULV spraying and why?

XC3 - PESTICIDE TOXICITY EXERCISE

Introduction

The LD50 figures given in the World Health Organization (WHO) Classification of Pesticides by Hazard are for the **active ingredient (a.i.)**. To arrive at the toxicity of the pesticide formulations themselves, these LD50 values must be adjusted to take account of the concentration of the products actually used.

This can be calculated by using the formula

$$\text{LD50 of formulation} = \frac{\text{LD50 of active ingredient} \times 100}{\text{percentage concentration of formulation}}$$

For example, as we have seen above, the LD50 of fenitrothion active ingredient is 503 mg/kg (moderately hazardous), but the LD50 of a 10% EC formulation of fenitrothion is:

$$\frac{503 \times 100}{10} = 5030 \text{ mg/kg (i.e. slightly hazardous)}$$

The WHO classification takes into account the **type** of formulation as well as the concentration. Therefore dry formulations are considered less toxic than liquid formulations.

Exercise

Use the WHO Hazard classification guide to determine the mammalian toxicity and hazard classifications of the following products and their formulations

1. look up the pesticide name and the page number in the WHO document index
2. find the pesticide and look up the LD50 of the active ingredient
3. Use the formula above to work out the formulation LD50
4. Use the table on page 3 of the WHO Classification of Pesticides by Hazard to find the toxicity class of the formulation

Pesticide name	concentration (%)	LD50 of a.i.	LD50 of formulation	WHO class of formulation (oral)
fenitrothion	80			
deltamethrin	5			
diazinon	60			
malathion	85			
dieldrin	50			
carbaryl	10			
diflubenzuron	6			

XC4 a - EXERCISE ON FIELD EQUIPMENT FOR CONTROL OPERATIONS

Please use the field equipment to make measurements and fill in the following table.

Whirling hygrometer

What is the wet temperature on the whirling hygrometer?	
What is the dry temperature on the whirling hygrometer?	
What is the relative humidity now?	

Anemometer

What is the maximum wind speed in a period of a minute?	
What is the minimum wind speed in a period of a minute?	
What is the average of three windspeeds taken during one minute?	

Compass

What is the bearing of the wind direction? (the direction that the wind is coming FROM)	
What is the bearing of the tallest thing you can see?	

Vibrating tachometer

What is the rotational speed in revolutions per minute (rpm) of the Micron Ulva + sprayer with 8 batteries?	
What is the rotational speed in revolutions per minute (rpm) of the Micron Ulva + sprayer with 5 batteries?	

XC4 b - MEASURING PACE LENGTH

For many types of field operation, it is useful to know how long your normal pace length is. For example, it is useful for walking transects during survey operations and for measuring track spacings during spraying. We **cannot** assume that the pace length is 1 m – it is usually much less.

EXERCISE - calibration of pace

Each group should measure out a distance of 100 m using the tape measure and plant a flag at each end. Each person should walk along the line and count the number of paces to reach the end. Each person does this 3 times in total, then use the table below to calculate pace length and number of paces for 10 m. Note that the walking style should be as if the person is doing normal survey and control field operations i.e. not trying to stretch each pace out to be a metre, nor strolling along very slowly.

Name	
(A) Distance covered (100m)	
Number of paces (1st time)	
Number of paces (2nd time)	
Number of paces (3rd time)	
(B) Average number of paces	
Number of paces to measure 10 m (B divided by 10)	
Length of pace (A divided by B)	

Two examples of where this might be useful:

1. If a locust survey officer measures a hopper band and finds that it is 240 paces long, and he knows that his pace length is 0.75 m, he can calculate the true length in metres by multiplying 240 paces x 0.75 m = 180 m.
2. If a locust control officer is marking 30 m track spacings for a vehicle sprayer and he knows that he uses 12 paces to walk 10 metres, he can work out how many paces he should use between spray passes by multiplying 12 paces by 3 (three ten metre lengths are the same as 30 m) = 36 paces between spray tracks.

XC5 a - FORM FOR RECORDING METEOROLOGICAL DATA DURING SWATH WIDTH MEASUREMENT

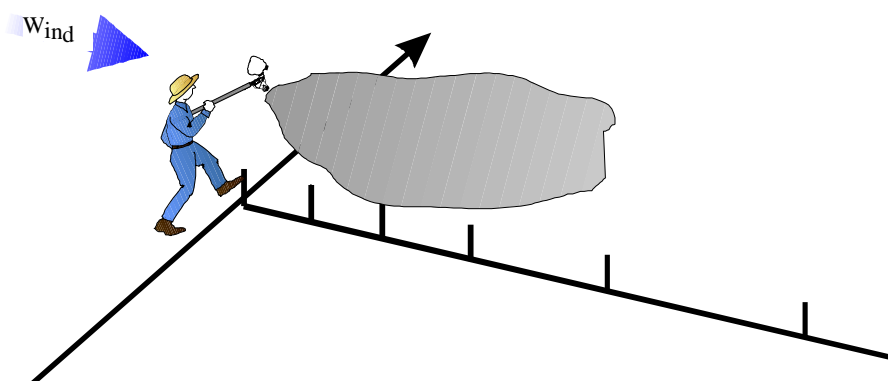
Factor	Group 1 swath (Group 2 to record)	Group 2 swath (Group 3 to record)	Group 3 swath (Group 4 to record)	Group 4 swath (Group 1 to record)
<i>Date</i>				
<i>Time</i>				
<i>Number of batteries and rotational speed (rpm)</i>				
<i>Emission height</i>				
<i>Bearings of spray line</i>				
<i>Wind direction during spraying</i>				
<i>Wind speed during spraying</i>				
<i>Temperature during spraying</i>				
<i>Sun conditions (sunny/cloudy)</i>				

XC5 b - SWATH WIDTH MEASUREMENT WITH HAND-HELD SPRAYERS

Introduction

The swath is the spray deposition downwind at right angles to a crosswind spray run.

We shall be looking at how the deposit varies with distance downwind. This will be estimated by counting the number of droplets per cm^2 on the upwind face of vertical rods at different distances downwind.



The rods will be set at distances of 0, 1, 2, 3, 5, 7, 10, 15, 20, 30, 50 and 80 m downwind.

Swath width is influenced by several factors such as wind speed, droplet size, emission height, temperature conditions. We will be looking at two variables:

1. Droplet size (large and small)
2. Emission height (high and low)

Spray will be produced by someone walking with an Ulva + sprayer. Large droplets will be produced by using 5 batteries and small droplets will be produced by using 8 batteries. Low emission height will be holding the spray head approximately 50 cm above the ground and high emission height will be holding it as high as possible, probably around 2.5 m.

Each group will measure deposit with one combination of these two variables.

Group 1. Small droplets (8 batteries), high emission height (2.5 m).

Group 2. Small droplets (8 batteries), low emission height (0.5 m).

Group 3. Large droplets (4 batteries), high emission height (2.5 m).

Group 4. Large droplets (4 batteries), low emission height (0.5 m)

EXERCISE

(1) Find the direction of the wind and using flags, mark out a spray line 100 m long at 90 degrees to the wind direction. Put out a line of rods running downwind from the spray line at the distances indicated above. Each group should measure the dry rpm of their atomizer disc.

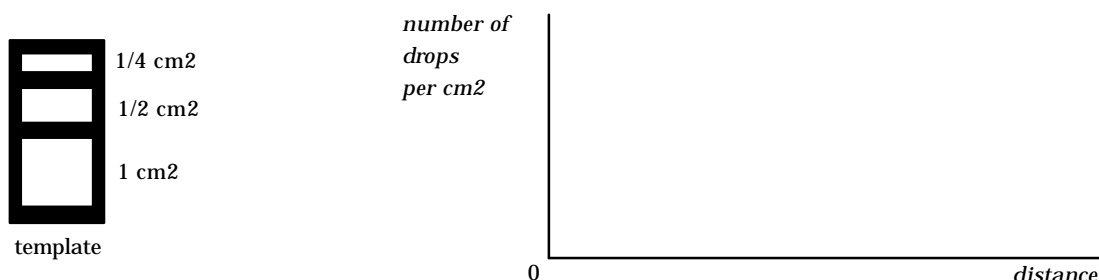
(2) Each group will have 12 pieces of oil sensitive paper and some Blu-Tak adhesive. Care must be taken with this paper because it can easily be marked if handled roughly, and fingerprints can make counting droplets difficult. Only the shiny side is sensitive. Handle the paper only by the ends of the strips and do not touch the middle. The papers should be attached near the top of the rods, facing into the wind, with the sensitive side of the paper on the outside.

(3) After spraying, the paper should be labelled with the distance and the treatment they have been given, and stuck onto a piece of paper. Do not allow anything to touch the surface of the papers as the droplets may get smudged and difficult to count.

(4) Group 1 should put out their papers first. The spray operator will then make a spray pass (or more if droplet numbers are insufficient) with large droplets and high emission height. Group 2 take the meteorological data for Group 1 during the spraying. Group 1 papers are then collected in. Group 2 then put out their papers and the spray operator makes a spray pass (or more) but this time with large droplets and a low emission height. Group 2 collects their papers. The exercise goes on until Group 4 has collected their papers and the field work is finished. Papers should be labelled and stuck to a piece of A4 paper with sticky tak then kept safely in a clipboard.

(5) Record the meteorological conditions during the spraying and other details, taking turns as groups as indicated on the table provided.

(6) Back in the classroom, use the templates and hand lenses to count the number of droplets on the papers. If there are many droplets, count the number seen in the 0.25 cm² template and multiply by 4 to give the number of droplets/cm². If there are very few droplets, use the 1 cm² template and no mathematical correction is necessary to give number of droplets/cm².



Questions:

- a) At what distance downwind does the swath begin
- b) At what distance downwind is the maximum deposit
- c) What is the swath width and how can we define it
- d) What is the effect of size of droplets on swath width
- e) What is the effect of emission height on swath width
- f) What track spacing can we use for each treatment in order to obtain a deposition that is reasonably uniform?

XC6 - DROPLET SIZE AND NUMBER EXERCISE

Introduction

If we reduce the size of the drops produced by the sprayer, we increase the number of drops we can make from each litre of pesticide. But how many more do we get?

EXERCISE

1. Each group has a piece of soft stuff. Make it into a ball and measure its diameter with the ruler.
2. Now break the ball of soft stuff in half and roll the two pieces into balls. Measure their diameter – are they half the diameter of the original ball?
3. If not, break the two balls in half again, make all four pieces into balls and measure their diameter. Are they half the diameter of the original ball?
4. If not, break these four balls in half again, make all eight pieces into balls and measure their diameter. Are they half the diameter of the original ball?
5. How many smaller balls have you made from the larger ball?
6. If we are spraying locusts and we reduce the pesticide droplet size from 200um to 100 um, how many times more drops will there be?

XC7 – CALIBRATION CALCULATIONS

Volume application rate (l/ha) = $\frac{\text{recommended dose (g a.i./ha)}}{\text{formulation concentration (g a.i./l)}}$ (Formula 1)

Flow rate (l/min) = $\frac{\text{VAR (l/ha)} \times \text{speed (km/h)} \times \text{track (m)}}{600}$ (Formula 2)

Summary of steps

If you have been given a new pesticide to apply against Desert Locusts, or you need to make changes to the application technique, the calibration calculations are a three step process:

Step 1: Find the dose (g a.i./ha). Identify the pesticide active ingredient you are using and consult the FAO list of recommended doses (or other source) to determine the recommended dose for the pesticide in g a.i./ha.

Step 2: Convert the dose to a volume application rate (l/ha). Read the pesticide formulation concentration in g a.i./l from the pesticide label and use Formula 1 above to calculate the volume application rate (VAR) in l/ha. (This VAR may already be given on the pesticide label, in which case Step 1 is unnecessary).

Step 3: Calculate the required flow rate (l/min) Use Formula 2 above to calculate the flow rate required to achieve this volume application rate (using some sensible figures for track spacing and forward speed).

Tip. Remember , ultimately the person in charge of the spraying operation must decide on sprayer settings depending on the conditions and circumstances

EXERCISE

Carry out the necessary calculation for these 4 examples below. You will need to look at the list of FAO recommended doses attached and **remember the 3 steps:**

(1) Imagine you are controlling hopper bands with hand-held sprayers using the pesticide bendiocarb as a **20% formulation containing 200 g/l**. You are using a **track spacing of 12 m** and a forward **speed of 4.8 km/h**. What is the flow rate you require to apply the recommended dose of the pesticide?

(2) Imagine you are controlling large hopper bands using a vehicle mounted sprayer and the pesticide **deltamethrin as a formulation with 12.5 g/l**. If your spray vehicle travels at **10 km/hr** with a **flow rate of 400 ml/min**, what is the track spacing you must use to achieve the recommended dose of the pesticide?

(3) Imagine you are managing a control operation on a settled locust swarm using an aircraft and the **pesticide fenitrothion in a formulation with 1000 g/l**. If a **track spacing of 0.1 km** is used and a **flow rate of 13 l/min**, what is the forward speed (in km/hr) that the aircraft must fly at to achieve the recommended dose to kill the locusts?

4) You are in a vehicle spraying hopper bands with **Karate 4% ULV (lambdacyhalothrin)**. You are using a **track spacing of 25 m** and a **flow rate of 250 ml/min**.

a) What is the vehicle speed in km/hr which you must use to apply the recommended dose?

b) If the wind becomes very weak and you have to reduce the track spacing to 15 m still to get a reasonably uniform pesticide deposition, what must you also do to maintain the application of the recommended dose?

XC8 a - HOW TO MEASURE AND SET THE FLOW RATE

After calculating the flow rate required to deliver the correct VAR, which will deliver the recommended dose, the flow rate must be measured and set. The general principles of measuring and setting flow rate are the same for all types of sprayer. However, aircraft may either be easier (if they have an electronic flow meter) or more difficult (if they have a windmill driven pesticide pump).

Tip: During real control operations, the flow rate must be measured with the pesticide itself because other liquids may flow faster or slower. Measure it at least 3 times to make sure there have been no errors.

Equipment required

You will need: notebook, pen, stop watch or watch with a second hand, measuring cylinder, bucket, protective clothing, soap and water, sprayer, pesticide, basic tools

Some sprayers work in a way which allows the operator to collect and measure the liquid emitted over a given time e.g. spinning disc sprayer with the disc stationary. It is more difficult with others e.g. exhaust nozzle sprayer since the spray comes out together with the airblast. In these cases, the amount lost from the tank over a given time is measured.

THE COLLECTION TECHNIQUE

(for use when spray liquid can be collected easily as it is emitted)

Step 1. Put on protective clothing, fill the sprayer and position it to deliver pesticide into a measuring cylinder, or into a bucket.

Step 2. Allow the pesticide to flow from the sprayer into the container for a measured number of seconds (M) between 60 and 180 seconds (1- 3 minutes).

Step 3. Use the measuring cylinder to measure the volume emitted and collected (E).

Step 4. Calculate the flow rate (F) in ml/min by using the formula below

$$F \text{ (l/min)} = \frac{E \text{ (l)} \times 60}{M \text{ (s)}}$$

Step 5. Adjust the flow rate to the value calculated previously. This may be done by changing the restrictor nozzle, altering a needle valve setting or adjusting the pump pressure. Consult the manufacturers manual for details on individual sprayers.

THE LOSS TECHNIQUE

(for use when the spray liquid cannot be collected easily as it is emitted)

Step 1. Fill the sprayer up to a known level with pesticide (either completely full or to a mark on the tank) and spray over the target area using your normal spraying technique for a measured time (M in seconds).

Step 2. Use a measuring cylinder to measure the amount of pesticide required to refill the sprayer back to its original level. This will give the amount emitted (E).

Step 3. Use the same formula above to calculate the flow rate and adjust if necessary to the value calculated previously:

Tip: if the wrong units are used, the formulae will give the wrong answer and the wrong dose will be applied. Be sure to check the units and convert them if necessary to the units in the formulae above.

To illustrate the two techniques, each group will measure flow rate with several different types of sprayer.

EXERCISE – N.B. make sure that sprayers and groups are well separated for this exercise – some sprayers are very noisy and airblasts may interfere with flow rate checks that other groups are doing

Micron Ulva Plus (group 1 will start – target flow rate is 40 ml/min)

Method A. Fit the orange nozzle to the sprayer and almost fill the bottle with water. Fit the bottle to the sprayer. **Without switching the disc on** turn the sprayer over and allow the water to fall into a funnel and a measuring cylinder for 1 - 3 minutes. Measure the volume of liquid in the measuring cylinder. Repeat twice more. Use Table 1 to note the data and to calculate the flow rate. If necessary, change the restrictor in order to get as near as possible to your target flow rate.

Method B. Put **exactly 500 ml** of water into the sprayer bottle. Spray outside for a period of 1 - 3 minutes using the same orange nozzle. Measure the volume of liquid remaining in the bottle. Repeat this twice more. Use Table 2 to note the results and to calculate the flow rate, then change restrictor if necessary to get as close as possible to your target flow rate. When you have finished with this sprayer, move on to the next sprayer below.

Knapsack mistblower sprayer (2 types) (group 2 will start – target flow rate is 100 ml/min)
Put water into the sprayer. Use either technique A or technique B above, whichever you think is most appropriate, to measure the flow rate then adjust it to your target flow rate. When you have finished with this sprayer, move on to the next sprayer below.

Micronair AU8115 (group 3 will start – target flow rate is 350 ml/min)

Use the technique which you think is most appropriate to measure the flow rate of this sprayer with water. Keep adjusting the pressure and/or the VRU in order to achieve your target flow rate. When you have finished with this sprayer, move on to the next sprayer below.

Micron Ulvamast (group 4 will start – target flow rate is 200 ml/min)

Use the technique which you think is most appropriate to measure the flow rate of this sprayer with water. Keep adjusting the flow rate until you have achieved your target flow rate. When you have finished with this sprayer, move on to the first sprayer above.

XC8 b - CALIBRATING SPRAYER SPEED

For any sprayer, speed has a direct effect on dose applied. Aircraft usually have good airspeed indicators, but operators of ground equipment are often not sure what speed they are driving or walking at.

The procedure for measuring sprayer speed is very similar for portable or vehicle-mounted sprayers.

Step 1. Using a measured distance of 100 m marked out with flags, walk or drive between the two flags at the maximum comfortable working speed and record the time taken. In a vehicle note the gear used and the engine speed (if the vehicle is fitted with a tachometer).

Step 2. Enter the data in to the table below and calculate the actual speed you were travelling.

Step 3. Repeat this twice more and calculate the average speed in m/s. This can be converted to km/h by multiplying by 3.6.

Replicate	Distance walked (metres) (A)	Time taken to walk or drive 100 m (secs) (B)	Actual speed (m/s) (A divided by B)
1			
2			
3			
Average			

XC11 – MORTALITY ASSESSMENT EXERCISES

Imagine that a hopper band and a swarm are being sprayed. How can we check mortality?

There are problems concerning the mobility of the insects, especially with pesticides which do not act very quickly. A larval band can move a distance of some hundreds of meters before there is an effect. It is necessary to follow the band to determine the mortality. During countings, it is necessary to take account of the possibility that the dead locusts can be eaten by birds or ants and that the live ones might change their behaviour because of the sub-lethal effects of the pesticide.

The problem of mobility is even more serious with adults because they might fly away. In this case, it is necessary to catch the insects and to put them in the cages immediately after the treatment in order to observe the effects of the pesticide. It is necessary to take account of the possibilities of contaminating, or of damaging the insects with the net which one uses to collect them or with the cages. For this reason, the cages which contain the untreated insects are very important. There is also the risk that the insects will escape or be eaten by ants.

Exercise 1. Mortality of a larval band (Groups 1 and 2 start, then 3 and 4)

There is a mock band set out (gravel or beans). In fact, there are four bands but they represent the same band at various times after treatment: the first is just before treatment, and the others represent the same band at two hours, eight hours and twenty four hours after the treatment. Each bean or gravel piece is a larva, probably at the 3rd stage, and the colour indicates the condition - the light coloured beans/gravel are the alive insects and the black beans/gravel are the dead insects.

You want to know how many insects there are in the band at the beginning. A method of estimating is to measure the length and width which, when multiplied together, give you, its estimated area. Then you make a transect of the band taking ten quadrat samples of the density of insects (a number by measures square). The average density multiplied by the area will give you a very approximate number of insects.

You do the same thing for the band after 2 hours, 4 hours and 24 hours, by noting the density of the live insects (light coloured) and the insects dead (black).

Finally, calculate the death rate of the band by the three methods below:

$$\text{a) Mortality (\%)} = \frac{(\text{alive (0 hr)} - \text{alive (24 hrs)}) \times 100}{\text{alive (0 hr)}}$$

$$\text{b) Mortality (\%)} = \frac{\text{dead (24 hrs)} \times 100}{\text{alive (0 hr)}}$$

$$\text{c) Mortality (\%)} = \frac{\text{dead (24 hrs)} \times 100}{\text{dead (24 hrs)} + \text{alive (24 hrs)}}$$

QUESTIONS

1. Is the mortality the same for the three methods? If not, why?
2. Which are the most difficult problems with assessing band mortality?

Exercise 2. Mortality of a settled swarm (Groups 3 and 4 start, then 1 and 2)

You spray a settled swarm and before the insects can fly, you catch some individuals with a net and put them in cages, 20 insects in each one. The envelopes represent the cages and the beans represent the insects. The light coloured beans are alive and the painted beans (black) are dead.

There are three types of cages:

- a) Untreated control. The insects were caught before the treatment, therefore did not receive any insecticide
- b) Sprayed insects with unsprayed vegetation. The insects were put in the cages after spraying, but with the vegetation is from outside (upwind of) the treated area.
- c) Sprayed insects with sprayed vegetation. The insects were put in the cages after spraying, with vegetation from inside the sprayed area.

There are also three exposure levels for the insects - immediately after spraying, at 2 hours and 24 hours after the treatment. A new series of envelopes represents each time after the treatment.

Count the number of insects (beans), alive and dead, in each cage (envelope).

Calculate mortality for the three types of cages with the following formula:

$$\text{Mortality (\%)} = \frac{\text{dead (24hrs)} \times 100}{\text{alive (0 hr)}}$$

QUESTIONS

1. What percentage mortality is there in the cages with sprayed insects and unsprayed vegetation?
2. Which percentage mortality is there in the cages with sprayed insects with sprayed vegetation?
3. Why is there a difference between the two?
4. Which percentage mortality did you find in the untreated cages and why are some of the insects dead?
5. Should we adjust the mortality figures for the other cages due to the mortality in the untreated cages?

XC12 – COMPLETING THE SPRAY MONITORING FORM

Please transfer the information from the 4 reports below to the FAO Spray Monitoring Form as clearly as you can.

1. Radio report of operations from Ali - spray team leader

Villagers called to the locust base to inform us of a Desert Locust infestation in their area. We went there and controlled three hopper bands in sand dunes on morning of 8 September 2002, using Decis 12.5% ULV. 3.5 hectares sprayed. Ulvamast hand-held sprayers were used with 5 batteries and orange nozzle. Operations started around 10.00 with strong wind blowing towards the south east. Sunny. Team of three men sprayed with sprayers. Batteries went down so they stopped after three bands. 5 litres of Decis used. Swath width was 10 m. One man headache, but he washed himself with the soap and water and rested and was OK. Hopper bands were visited in evening – many dead locusts. One band got lost.

2. Verbal report during breakfast from pilot Jonas on 3 October 2002.

One swarm was sprayed when roosting in tall trees – estimated area of 5 km². Aircraft was Piper Pawnee Brave fitted with boom and nozzle equipment, with nozzles facing backwards. Dursban 45% ULV was used – four drums used - track spacing 100 m, airspeed 100 knots. Spray passes carried out East/West. Spraying started at 07.10, but wind direction not certain. GPS worked very well. After 08.00 ground team arrived and reported wind to be 2 – 3 m/s from bearing of 70 degrees. Job completed around 08.40 – air temperature 31 ° C.

3. Ground team report handwritten on paper and passed to locust base by Mamoon on 15 September 2002.

Block for barrier spraying with scattered hopper bands – some instar 4 and some adult fledgling. Green vegetation 25 – 35 cm tall – mostly *Cenchrus biflorens*, drying out. Soil moist at 20 cm depth, cloud cover 75%, temperature on arrival at 06.45 was 37 ° C. Flagmen deployed with vehicles over block of 10 km x 5 km as provided in map coordinates by survey team. Flags were red and one yellow, but two poles broken so new branches cut from trees. Pesticide was diflubenzuron (trade name not known) 6% ULV and pilot instruction was to spray at 100 g a.i./ha within the barriers. Aircraft was fixed wing and came at 11.25 and sprayed 6 passes (each 10 km long) for about 45 minutes with 4 Micronair AU5000 units – flow rate was reported to be 5 l/min from each atomiser. Blade angle was 40 degrees. Windspeed was 7.32 m/s. Humidity 130 %. Flying height was too low. When driving back to base, some small swarms seen flying out of the block.

4. Report by telephone to base by field officer on 19 October 2002.

Large swarm was sprayed on evening of 17 October 2002 until after darkness using Micronair AU8115 airblast sprayer. Locusts were roosting in low trees around 5 m high, over an area of 1 ha. Flow rate set to 500 ml/min and spray directed up into the trees after the wind dropped down to calm conditions. Area sprayed from all sides to try to get pesticide to all of them. Pesticide used was Sumithion ULV. One driver got dizzy after his dust mask became wet with spray. Many dead locusts falling from the trees. Sample of the green adult locusts taken back for confirmation. Reports of sick camels for 2 weeks afterwards.

XC12 – COMPLETING THE SPRAY MONITORING FORM

Please transfer the information below to the FAO Spray Monitoring Form as clearly as you can.

Case	Extra points apart from missing data
1. Radio report of operations from Ali - spray team leader	
Villagers called to the locust base to inform us of a Desert Locust infestation in their area. We went there and controlled three hopper bands in sand dunes on morning of 8 September 2002, using Decis 12.5% ULV. 3.5 hectares sprayed. Ulvamast hand-held sprayers were used with 5 batteries and orange nozzle. Operations started around 10.00 with strong wind blowing towards the south east. Sunny. Team of three men sprayed with sprayers. Batteries went down so they stopped after three bands. 5 litres of Decis used. Swath width was 10 m. One man headache, but he washed himself with the soap and water and rested and was OK. Hopper bands were visited in evening – many dead locusts. One band got lost.	Wrong description of sprayer – Ulvamast is an vehicle sprayer – they probably mean Micron Ulva +. If batteries went down, how slowly were the discs spinning before they stopped?
2. Verbal report during breakfast from pilot Jonas on 3 October 2002.	
One swarm was sprayed when roosting in tall trees – estimated area of 5 km ² . Aircraft was Piper Pawnee Brave fitted with boom and nozzle equipment, with nozzles facing backwards. Dursban 45% ULV was used – four drums used - track spacing 100 m, airspeed 100 knots. Spray passes carried out East/West. Spraying started at 07.10, but wind direction not certain. GPS worked very well. After 08.00 ground team arrived and reported wind to be 2 – 3 m/s from bearing of 70 degrees. Job completed around 08.40 – air temperature 31 ° C.	If wind is 70 degrees, then an East/West spray line is WRONG. Nozzles are the wrong thing for ULV and should certainly not be facing backwards.
3. Ground team report handwritten on paper and passed to locust base by Mamoon on 15 September 2002.	
Block for barrier spraying with scattered hopper bands – some instar 4 and some adult fledgling. Green vegetation 25 – 35 cm tall – mostly <i>Cenchrus biflorens</i> , drying out. Soil moist at 20 cm depth, cloud cover 75%, temperature on arrival at 06.45 was 37 ° C. Flagmen deployed with vehicles over block of 10 km x 5 km as provided in map coordinates by survey team. Flags were red and one yellow, but two poles broken so new branches cut from trees. Pesticide was diflubenzuron (trade name not known) 6% ULV and pilot instruction was to spray at 100 g a.i./ha within the barriers. Aircraft was fixed wing and came	Note how long after ground team got there that the spraying was done Note the obsession with detail other than the important ones.

<p>at 11.25 and sprayed 6 passes (each 10 km long) for about 45 minutes with 4 Micronair AU5000 units – flow rate was reported 5 l/min each atomiser. Blade angle was 40 degrees. Windspeed was 7.32 m/s. Humidity 130 %. Flying height was too low. When driving back to base, some small swarms seen flying out of the block.</p>	
<p>4. Report by telephone to base by field officer on 19 October 2002.</p>	
<p>Large swarm was sprayed on evening of 17 October 2002 until after darkness using Micronair AU8115 airblast sprayer. Locusts were roosting in low trees around 5 m high, over an area of 1 ha. Flow rate set to 500 ml/min and spray directed up into the trees after the wind dropped down to calm conditions. Area sprayed from all sides to try to get pesticide to all of them. Pesticide used was Sumithion ULV. One driver got dizzy after his dust mask became wet with spray. Many dead locusts falling from the trees. Sample of the green adult locusts taken back for confirmation. Reports of sick camels for 2 weeks afterwards.</p>	<p>Driver should not be getting spray on him. Should not be wearing a 'dust mask' – how did it get wet?</p> <p>Green adults locusts must be a different species from DL.</p> <p>Fenitrothion is relatively slow acting, so if there were many dead locusts quickly after spraying, definitely an OVERDOSE. Sick camels is also a sign</p> <p>Spraying from all directions is dangerous.</p>

CX13 - MOCK BAND SPRAYING EXERCISE

Introduction

All groups are given a new formulation of insecticide to control two bands of Desert Locusts. You will be given the GPS coordinates of the bands. Please take all equipment to treat these bands with the recommended dose of insecticide as given in the FAO Guidelines. In fact you will be using water, but you should measure exactly the quantities of pesticide (water) you use and all other details to fill in the FAO Locust Survey Form and Spray Monitoring Form.

Which group	Insecticide	Formula tion	GPS coordinates of band 1	GPS coordinates of band 2
Group 1	bendiocarb	20% w/v		
Group 2	chlorpyrifos	30% w/v		
Group 3	lambdacyhalothrin	3% w/v		
Group 4	deltamethrin	1% w/v		

Meeting point coordinates =

Equipment needed

- 4 Micron Ulva + sprayers
- 24 D size batteries
- 24 flags
- 4 vibrataks
- 4 GPS
- 4 compasses
- dark colour gravel to make fake hopper band
- spray monitoring forms
- radios
- shovels and buckets for making bands
- 2 vehicles for making the bands in advance

XT1a - TRAINER PERCEPTIONS

NOTE: To be given out 1 day before first training session for participants to complete

Look at the table below and indicate what you feel about these statements by ticking the appropriate boxes.

Tick the first column if you **strongly agree** with the statement and often have these doubts and feelings

Tick the second column if you **generally agree** with the statement and sometimes have these doubts and feelings

Tick the third column if you **disagree** with the statement and never have these doubts and feelings.

XT1b - TRAINER PERCEPTIONS

		Strongly agree	Generally agree	Disagree
1	I feel I don't know enough about the subject			
2	I don't know what to include and what to leave out			
3	I never know how long or short a course or a session should be.			
4	I don't know what criteria to use to structure and plan a training session / programme			
5	I'm never sure what I am trying to achieve or how I can measure my success			
6	The people I am expected to train know more than I do.			
7	I don't feel confident when standing up in front of an audience			
8	I don't know how to get my trainees to participate in sessions so I usually give them a lecture from my notes.			
9	I feel I should use visual aids but I don't really know how to use them			
10	I can give a demonstration on a practical subject but I find it difficult to organise a practical session so that all the participants can get practice in doing the task.			
	Enter below any other points you want to discuss.			

XT2a – LEARNING STYLE EXERCISE – STEP 1

EXERCISE This is a short questionnaire which will help to discover each participant's preferred learning styles. The accuracy of the results depends on how honest the answers are. There are no right or wrong answers.

Step 1

Use table 1 Learning Style Answer sheet to record your answers. If you agree more than you disagree with a statement put a tick by it (☑). If you disagree more than you agree put a cross by it (☒).

Table 1.

(☑)(☒)

1. I have strong beliefs about what is right and what is wrong, good and bad.	
2. I often act without considering the possible consequences.	
3. I tend to solve problems using a step-by-step approach.	
4. I believe that formal procedures and policies restrict people.	
5. I have a reputation for saying what I think, simply and directly.	
6. I often find that actions based on feelings are as sound as those based on careful thought and analysis.	
7. I like the sort of work where I have time for thorough preparation and implementation.	
8. I regularly question people about their basic assumptions.	
9. What matters most is whether something works in practice.	
10. I actively seek out new experiences.	
11. When I hear about a new idea or approach I immediately start working out how to apply it in practice.	
12. I am keen on self-discipline such as watching my diet, taking regular exercise, sticking to a fixed routine etc.	
13. I take pride in doing a thorough job.	
14. I get on best with logical, analytical people and less well with spontaneous, "irrational" people.	
15. I take care when interpreting data available to me and avoid jumping to conclusions.	
16. I like to reach a decision carefully after weighing up many alternatives.	
17. I'm attracted more to novel, unusual ideas than to practical ones.	
18. I don't like disorganised things and prefer to fit things into a coherent pattern.	
19. I accept and stick to established procedures and policies so long as I regard them as an efficient way of getting the job done.	
20. I like to relate my actions to a general principle.	
21. In discussions I like to get straight to the point.	
22. I tend to have distant, rather formal relationships with people at work.	
23. I thrive on the challenge of tackling something new and different.	
24. I enjoy fun-loving, spontaneous people.	
25. I pay meticulous attention to detail before coming to a conclusion.	
26. I find it difficult to produce ideas on impulse.	
27. I believe in coming to the point immediately.	
28. I am careful not to jump to conclusions too quickly.	
29. I prefer to have as many sources of information as possible - the more data I have to think over the better.	
30. People who don't take things seriously enough usually irritate me.	
31. I listen to other people's point of view before putting my own forward.	
32. I tend to be open about how I'm feeling.	
33. In discussions, I enjoy watching the manoeuvrings of the other participants.	
34. I prefer to respond to events on a spontaneous flexible basis rather than think things out in advance.	
35. I tend to be attracted to techniques such as network analysis, flow charts, branching programmes, contingency planning etc.	
36. It worries me if I have to rush out a piece of work to meet a tight deadline.	
37. I tend to judge people's ideas on their practical merits.	
38. Quiet, thoughtful people tend to make me feel uneasy.	
39. In meetings I put forward practical realistic ideas.	
40. I can often see practical ways to get things done quicker than other people.	

XT2c – LEARNING STYLE EXERCISE – STEP 2

In table 2 below record all the “yes” answers (☑) you made in table 1 against the question number shown in the columns in Table 2.

Do not record any questions you answered no (☒)

Add up and record the total of all the “yes” answers in each column

Table 2. Learning style recording sheet

Active	Thinking	Logical	Practical
2	7	1	5
4	13	3	9
6	15	8	11
10	16	12	19
17	25	14	21
23	28	18	27
24	29	20	35
32	31	22	37
34	33	26	39
38	36	30	40
Total of ticks =	Total of ticks =	Total of ticks =	Total of ticks =
Multiplied by 2 =	Multiplied by 2 =	Multiplied by 2 =	Multiplied by 2 =

XT2d – LEARNING STYLE EXERCISE – STEP 3

In the table below **circle** your column scores from Table 2 on the appropriate column and number score from the score sheet for each category

Active	Thinking	Logical	Practical	Preference
20	20	20	20	
19				
18		19		
17			19	
16	19	18		Very Strong
15			18	
14		17		
13	18	16	17	
12	17	15	16	
	16			<i>Strong</i>
11	15	14	15	
10	14	13	14	
9	13	12	13	
8				<i>Moderate</i>
7	12	11	12	
6	11	10	11	
5	10	9	10	<i>Low</i>
4	9	8	9	
3	8	7	8	
	7	6	7	
	6	5	6	
2	5	4	5	
	4		4	Very Low
1	3	3	3	
	2	2	2	
	1	1	1	
0	0	0	0	

This will show your most and least preferred style

XT3 - TRAINEE GROUP PROFILE FORM

Number of people to be trained

Male or female or a mix

Age range

Literacy and numeracy levels, language normally used

Range of educational ability (general education and technical training)

Previous “hands on” experience in the topic to be covered

Previous knowledge of the topic

Possible areas of interest and motivation

Social/cultural factors relevant to the training programme and approach

Other relevant information.

XT4 - TRAINING NEEDS ANALYSIS - DIAGNOSIS SHEET

Role/Job: FIELD OBSERVER REPORTING					
Column 1	2	3	4	5	6
Tasks/sub tasks/ Responsibilities From Job description above	No Problems	Some Problems	Many Problems	Cause of Problems/ Comments	Training Needs
1 Accurate observation				Insufficient life cycle knowledge and recognition skills	
a) Identifies and describes adults and hoppers by instar and sex				Does not recognise hopper instars or locust sex	Life cycle Characteristics of each stage and sex and practice in recognition
b) Accurately defines / describes quantity by reference to swarm dimensions and density / area				Problems with measuring flying swarms and flying speed	Speed / time / density /area calculations
c) Accurately report on swarm behaviour and wind direction e.g. High / low flying – on ground – Mating / laying etc				Confusion with mating and laying behaviour	Locust behaviour during laying and mating. Key indicators
2 Accurate time reporting					
a) Accurate registering of date and time including day and night					
3 Location					
a) accurate positioning of sighting by use of map co-ordinates (longitude and latitude)					
b) give position relationship to major geographical features Sea – city Mountain etc					
c) Includes well known local reference point					
4 Observer					
a) Includes name, address and contact details					
5 Report quality					
a) Report structured according to prescribed layout					
b) Descriptions and data easily understood					
c) Sent promptly to reporting office					
6 Importance of reports					
a) Understands need for accuracy and timeliness of reports to Locust Control Programme					

XT7a - SESSION SUMMARY SHEET

P1	Session Summary	Duration
		10 mins

Aim:

Objective:

Key training points:

Equipment:

Preparation:

Guidelines page references:

XT7b - SESSION PLAN SHEET

P1	Session Plan	Duration
		10 minutes

SECTION	TECHNIQUE AND CONTENT	AIDS
Introduction (mins)		
Core (mins)		
Summary & Conclusion (mins)		

XT8a - TRAINING SESSION SELF-EVALUATION CHECKLIST

Training is like any other job: it needs practice and continuous attention to detail. The self-evaluation sheet below can help you to improve your training skills if you answer them truthfully and try to improve the areas you appear to be weak.

HOW WELL DID I.....?	very well	good	satisfactory	not very well	poorly	not applicable
1 Link this session to other sessions						
2 Introduce this session						
3 Make objective clear to the trainees						
4 Move logically through the structure						
5 Emphasise key points						
6 Summarise the session						
7 Maintain an appropriate pace						
8 Capture trainees' interest						
9 Maintain trainees' interest						
10 Handle problems of inattention						
11 Ask questions						
12 Handle trainees' responses						
13 Direct trainee tasks						
14 Cope with the range of ability						
15 Monitor trainee activity						
16 Use a range of teaching aids						
17 Make contact with all class members						
18 Cope with individual difficulties						
19 Keep the content relevant						
20 Be aware and use body language						
21 Maintain good eye contact with all trainees						
22 Check learning						
23 Build trainee confidence						
24 Convey enthusiasm						
25 Provide a role model						

Note:

- 1 This is a tool for self-evaluation but it is also useful for a master trainer when observing other trainers
- 2 Where two or more trainers are working together this can also be a good way for trainers to share their experience and strengthen each others skills by observing each others sessions.