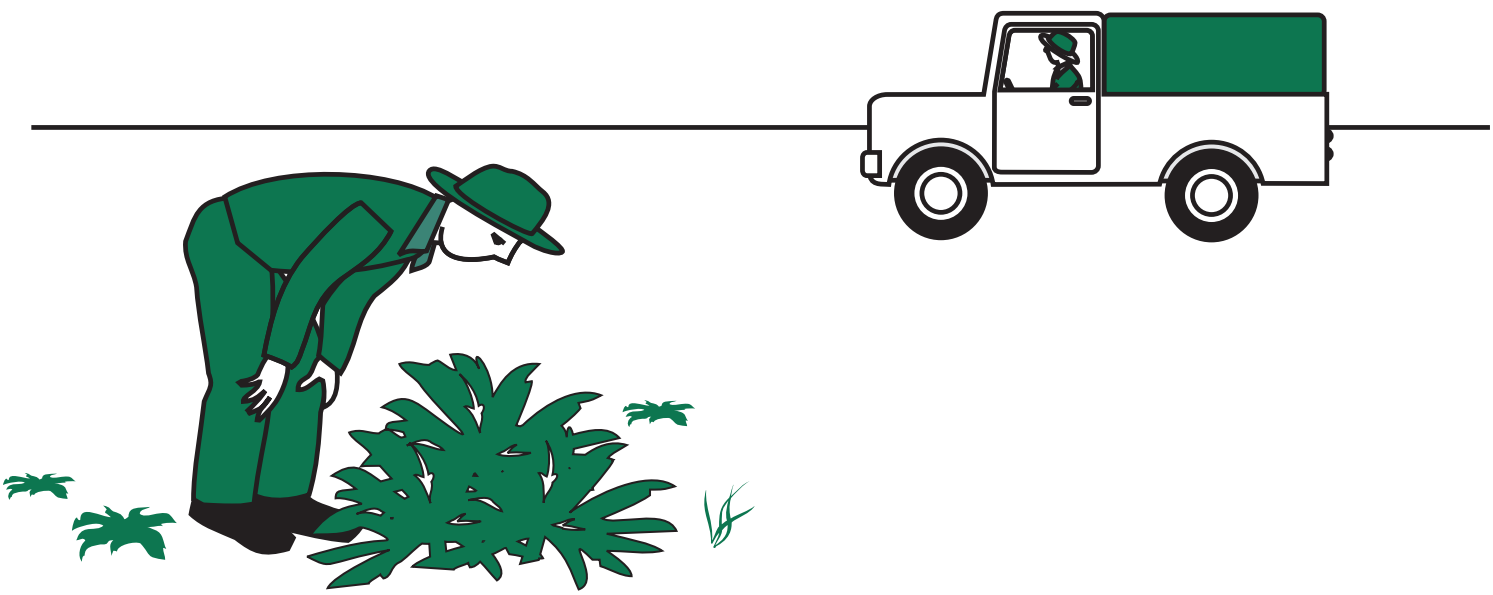
Food and Agriculture Organization
of the United Nations



Standard Operating Procedures (SOP) for Desert Locust Ground Survey

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Food and Agriculture Organization of the United Nations
Rome, 2021

Standard Operating Procedures (SOP) for Desert Locust Ground Survey

Objective

The objective of the Standard Operating Procedures (SOP) for Desert Locust Ground Survey is to give concise instructions for effective and safe ground survey operations against the Desert Locust. These instructions are intended for use by the field staff who are involved in Desert Locust monitoring to help them avoid dangerous, ineffective or wasteful operations. They are based on the **FAO Desert Locust Guidelines** where more detailed information and references are available.
The instructions focus on:

- survey planning and equipment
- survey types and methods
- data collection and reporting
- using eLocust3

1. Advanced preparation

A series of steps need to be followed before, during and after locust surveys.

PREPARATIONS
(three months before survey operations)

- Determine what type and number of vehicles are required for survey operations
- Select competent, energetic survey teams and provide them with training or refresher training
- Check and service the vehicles
- Check that the commonly needed spare parts and spare tires are available, and vehicles are equipped with a HF radio (whenever possible) and a first aid kit
- Make sure that operational funds are allocated for the proposed survey period in the field to cover field allowances, fuel, mobile data credit, etc.
- Make sure that sufficient equipment (eLocust3, GPS, radios, compass, maps) are available for each survey team
- Ensure that enough copies of the *FAO Desert Locust Standard Survey/Control Form* are available

2. Survey team and field equipment

Survey Team: one locust officer, one driver and vehicle. Use two vehicles in remote areas

Equipment: to be available for each team

REQUIRED

- eLocust3 or FAO form [1]
- hand-held GPS [2]
- maps (1:200-500,000)
- paper and pen
- first aid kit

OPTIONAL

- sweep net
- dissecting kit
- sample boxes
- tool kit and shovel
- tally counter
- hand lens (x10)
- compass
- HF radio in the vehicle
- HF or UHF walkie-talkies for communication between vehicles

[1] *FAO Desert Locust Standard Survey/Control Form*

[2] *Extra batteries, cigarette lighter adapter, remote antenna*

3. Before the survey

Step 1. Determine what areas need to be surveyed and when based on information from all possible sources (nomads, locals, villagers, travellers) and combined with rainfall and habitat data. The Locust Information Officer should provide this information

Step 2. Use maps to help determine the planned survey route

Step 3. Prepare the vehicles and make sure that all field and communication equipment are working, including eLocust3. If GPS is to be used, set the coordinates to degrees, minutes and seconds

Step 4. Ensure that survey officers know how to make surveys and use the equipment

Step 5. Decide what type of survey to do. If you do not know if locusts are present or not, make a rapid ***assessment*** survey. If significant locust populations are already present, then make a ***search*** survey to estimate the total infested area and delimit the areas that require control (see pages 13–14)

4. Making a survey

Step 1. Before leaving your office, home or town, turn on your eLocust3 device and make sure the GPS coordinates are changing as you drive

Step 2. Go to an area where locusts are likely or already known to be present (see pages 11–12)

Step 3. Make either a foot or vehicle transect at the survey location (see pages 7–9)

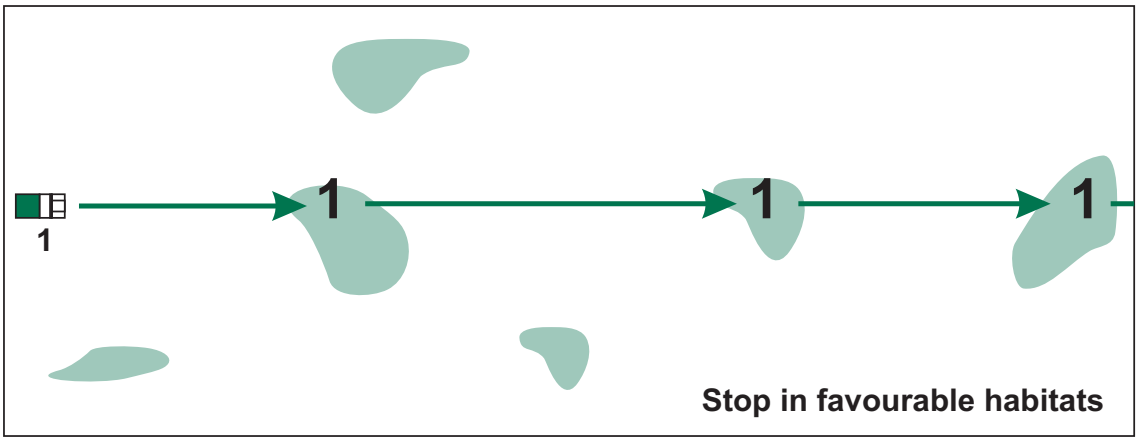
Step 4. Submit the eLocust3 report before leaving to the next survey step; you do not have to wait for it to be sent (see pages 17–19)

Step 5. You may also wish to record the data on the *FAO Desert Locust Standard Survey/Control Form* as a backup

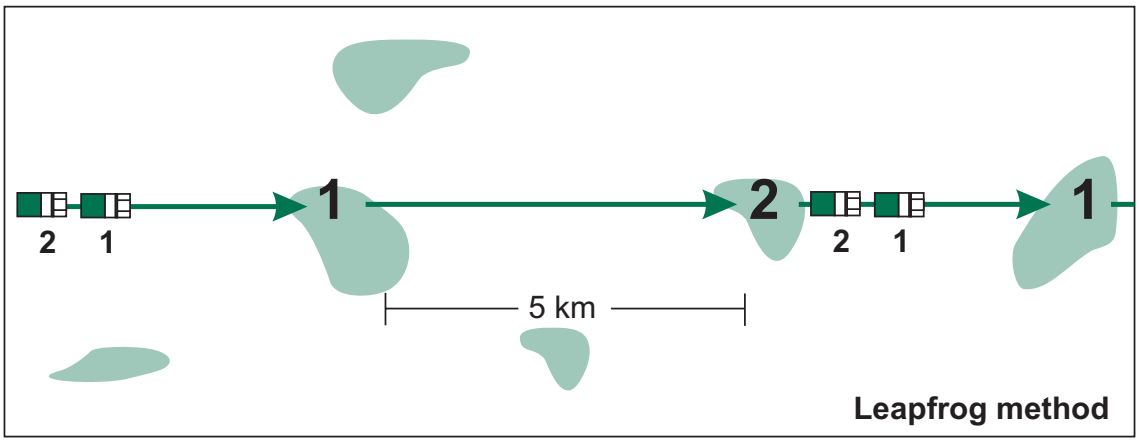
Step 6. Drive to the next survey area (while the eLocust3 data are being sent)

Step 7. Continue until the end of the day – you should be able to make about 4–10 survey stops in one day

If you find significant locust populations, it is better to continue surveying over the planned route to have a better idea of the entire situation. You or another team can come back later to intensively search the infested areas.

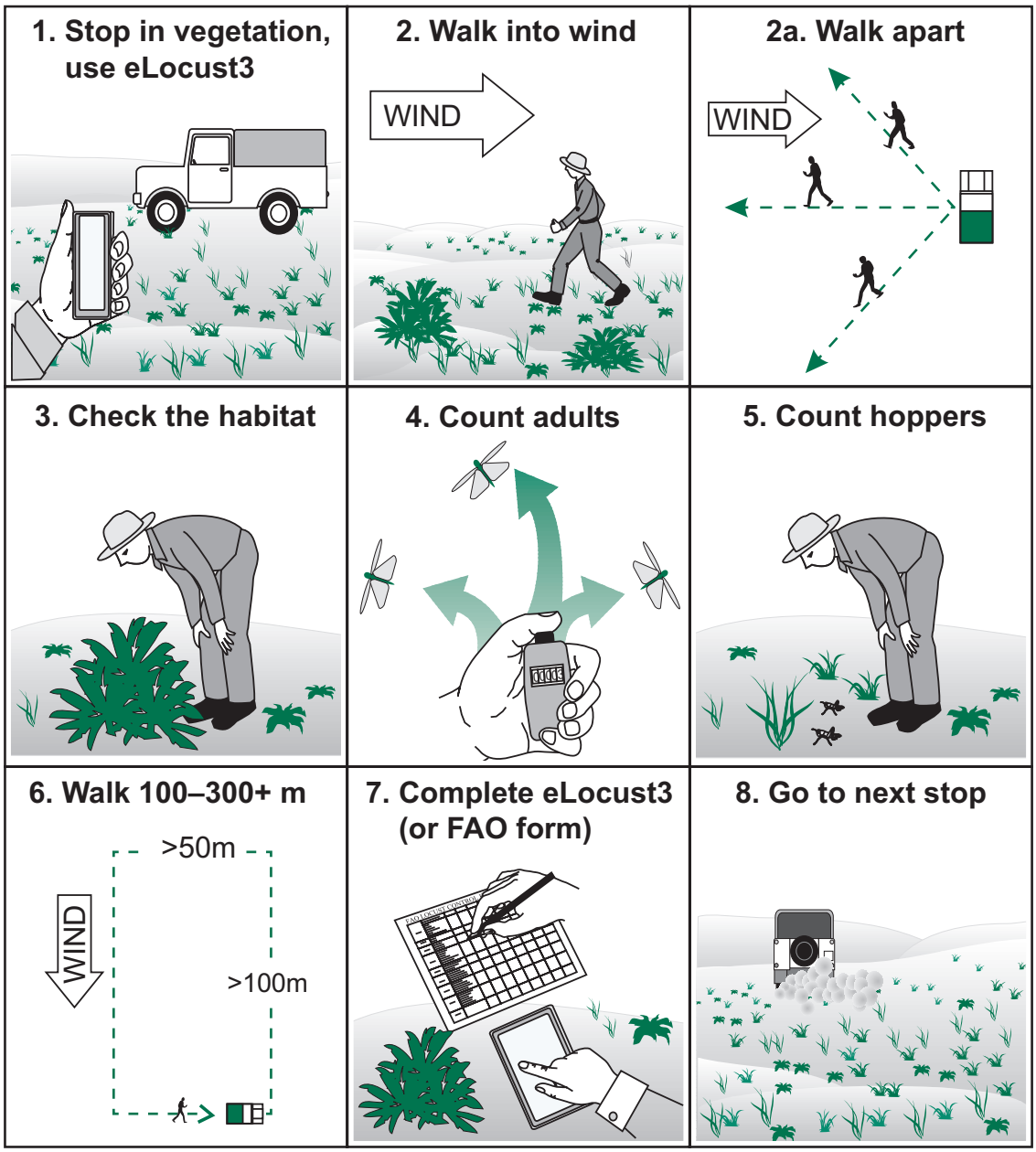


One vehicle: a single vehicle can be used during a survey to stop in sandy areas where there is green vegetation.



Two vehicles: nearly double the area can be covered when with two vehicles. The first vehicle surveys while the second vehicle drives ahead for about 5 km and then surveys. After the first vehicle finishes, it drives to meet the second vehicle. They both proceed together until the first vehicle stops to survey while the second vehicle continues for about another 5 km and stops for survey.

6. Survey methods – foot transect



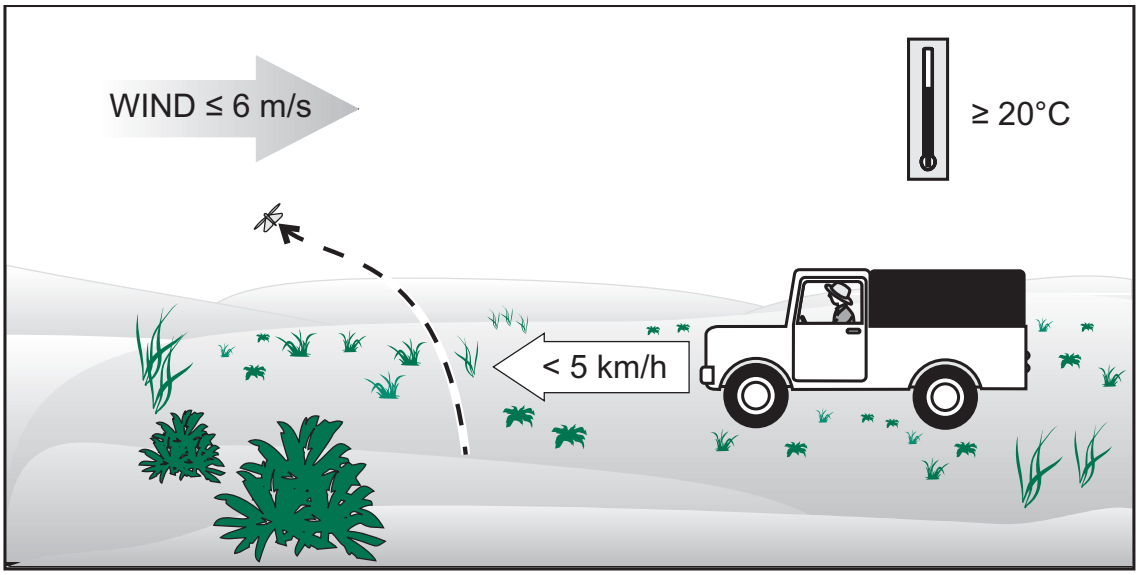
6. Survey methods – foot transect

Foot transect (maximum time: 20 minutes)

- Walk about 300 m into the wind or crosswind
- Observe the vegetation greenness and density
- Stop several times to check the soil moisture
- Count any locust adults that fly up, note their colour, behaviour and maturity (estimate the width of the strip in which adults are being disturbed, usually about 1-4 m on either side of you). Temperature must be above 20°C
- Stop occasionally and closely inspect the ground and vegetation for hoppers, noting what instar stage, colour, behaviour and number per bush or square metre. Repeat this up to 10 times
- Record your observations in eLocust3 and/or on the *FAO Desert Locust Standard Survey/Control Form*
- Drive to the next survey stop

If you do not have eLocust3, use the *FAO Desert Locust Standard Survey/Control Form*

6. Survey methods – vehicle transect



Vehicle transect (maximum time: 10 minutes)

- Drive upwind or crosswind for at least 1 km
- Drive at a walking pace in low (4WD) gear
- Count adults that fly up in front of the vehicle
- Keep track of the distance using the odometer
- Count only when temperature is above 20°C and wind speed is less than 6 m/s
- Stop and record your observations in eLocust3 and/or on *FAO Desert Locust Standard Survey/Control Form*
- Drive to the next survey stop

7. After the survey

Step 1. Check that all eLocust3 reports have been transmitted and no reports remain in the queue

Step 2. If necessary, submit completed *FAO Desert Locust Standard Survey/Control Forms* to the National Locust Unit HQ

Step 3. Check and, if necessary, repair the equipment so it is ready for the next survey

If you are using eLocust3, remember to charge the battery fully the night before you plan to make your survey

If the date and time are wrong, you may need to recharge the internal battery of the tablet by keeping it on and connected to power (with display off) for 3 full days

8. Where and when to make surveys

Where

- Sandy areas where the natural vegetation is green
- Desert areas that have received recent rainfall
- Areas where locals report seeing locusts
- Areas previously infested by locusts or where control was carried out
- Areas that could receive locusts from neighbouring countries

When

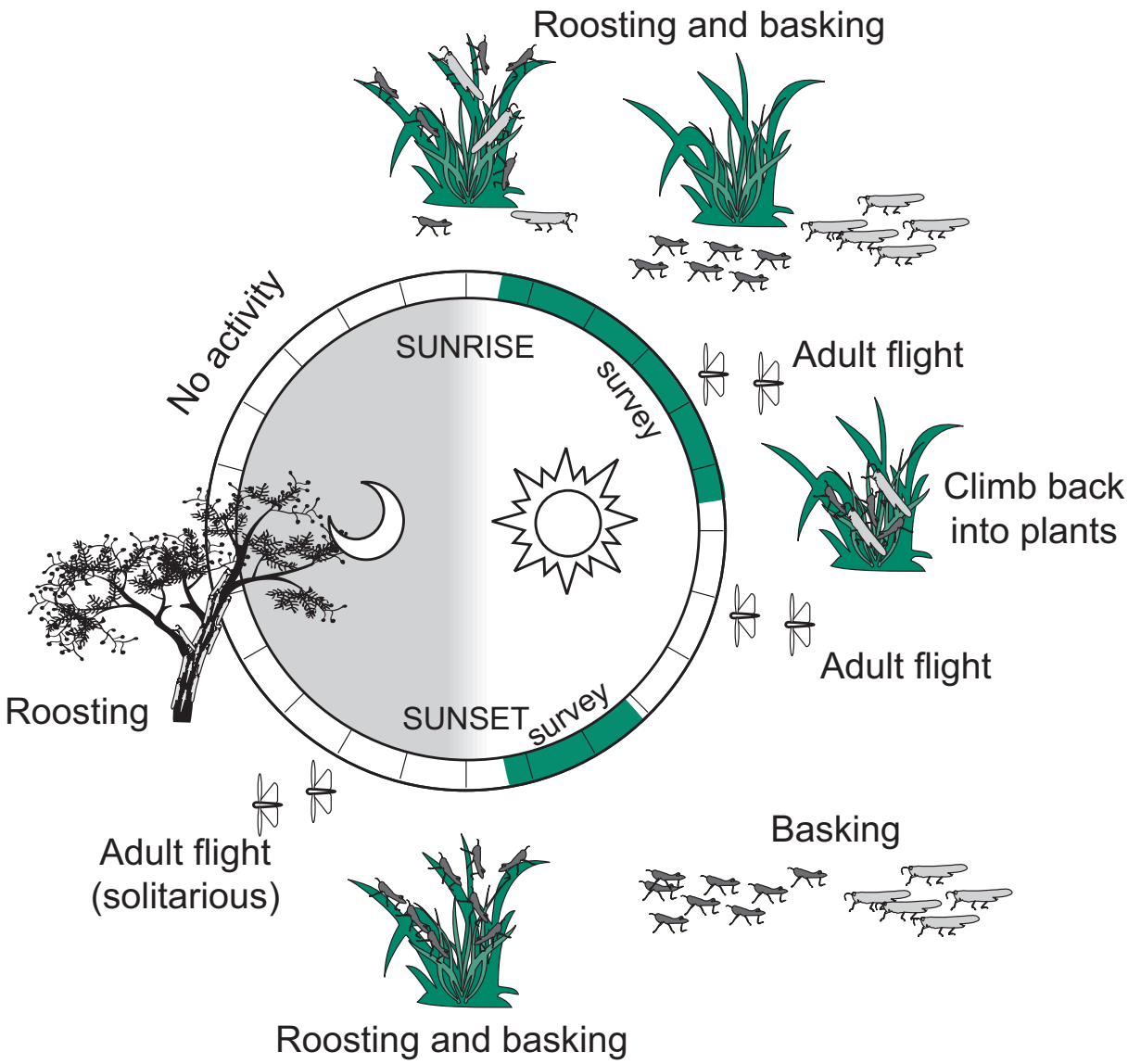
During the year

- About two weeks after rain has fallen (to allow sufficient time for the vegetation to become green)
- If there is no information from a certain area about rainfall, ecological conditions or locusts
- Regularly during the rainy season

During the day

- When temperature is 20–38°C
- From shortly after sunrise to about midday
- In the afternoon for a few hours just before sunset

8. Where and when to make surveys



9. Survey types

Assessment

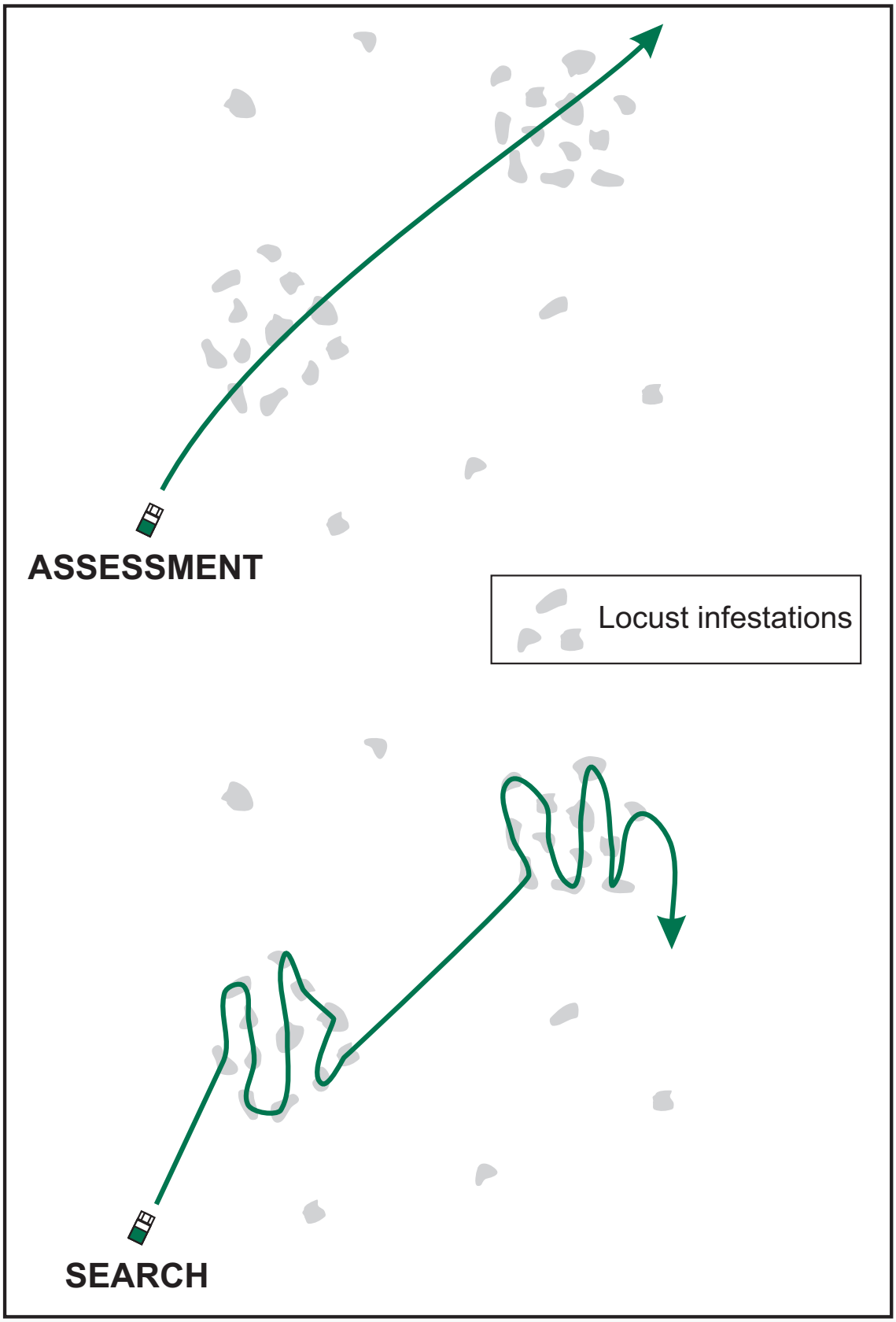
- The first type of survey carried out in the field to determine if locusts or green vegetation are present
- Undertaken in areas that have a history of locusts or breeding, where rain has recently fallen, or where nomads, locals, scouts, farmers or agricultural extension agents have reported locusts
- Purpose is to monitor the locust and habitat situation and to determine whether significant populations are present that may require control

Search

- If significant populations are found during an ***assessment*** survey, then a ***search*** survey should be undertaken
- An intensive survey to estimate the total infested areas and to delimit the areas that require control
- From the results of search surveys, the scale of the risk and level of required control can be estimated

If only low numbers of locusts are found during an *assessment* survey, there is no need to make a *search* survey. Instead, another *assessment* survey should be conducted at a later date, depending on habitat conditions and rainfall

9. Survey types



10. What information to collect

Location

- Location name
- Date
- GPS latitude and longitude (*DDMMSS.S*)
- Survey area, habitat and soil type

Rainfall

- Approximate date and amount of last rain

Vegetation

- Greenness and density

Soil

- Wet or dry

Locust

- Presence / absence
- Appearance (*solitary, transiens, gregarious*)
- Behaviour (*isolated, scattered, groups*)
- Maturity (*instar, fledgling, immature, mature*)
- Breeding (*copulating, laying, hatching, fledging*)
- Density (*locusts/transect (l x w) or /m^2*)
- Size (*no. of m^2 or ha*)

Control

- Insecticide, application rate, quantity used, area treated

11. How to record data

Survey data and observations can be entered into eLocust3 or they can be written down on the *FAO Desert Locust Standard Survey/Control Form* (or similar form).

eLocust3

- Information from an unlimited number of survey stops can be entered
- Send the data from the survey stop before moving to the next location
- A copy of the data is saved in eLocust3

Survey form

- Data from three survey stops can be entered on one *FAO Desert Locust Standard Survey/Control Form*
- If you make more than three stops, use additional forms
- Enter the data from the survey stop and check it before moving to the next location

eLocust3 immediately sends the survey results to the Locust Unit HQ. If you do not use eLocust3, then you should get the completed forms to HQ as soon as possible by radio, fax or in person

12. Using eLocust3

Step 1. Turn on the tablet when leaving the office or camp; make sure the date and time are correct

Step 2. Mount the antenna on the roof or on the front dashboard in the vehicle and connect the cable to the antenna and the cigarette lighter socket

Step 3. When you arrive at the survey location, turn off the engine, take eLocust3 with you

Step 4. Press **NEW REPORT** and make sure the GPS coordinates are correct. These will now be fixed for your location while the GPS coordinates at the bottom will change as you move

Step 5. Make the foot transect and enter the data

Step 6. After all data have been entered, press the **SAVE/SEND** key

Step 7. When the driver sees that you are returning to the vehicle, he should start the engine

Step 8. eLocust3 will start to send the data when you are close to or inside the vehicle. It is now safe to continue to the next survey stop but **do not turn off the engine** during data transmission

Step 9. Follow the progress of data transmission at the bottom of the tablet (Connection: Idle – Connecting to BT – Connecting to SAT – Sending – Sent) and the Queue will be 0

Always keep eLocust3 turned on during the survey throught the entire day to make sure you have the correct GPS coordinates

13. Using eLocust3m

eLocust3m can be used in two different modes: BASIC (minimal data) and PRO (complete data on ecology, locust, control and safety)

Step 1. Open the eLocust3m app on your smartphone and connect to the Internet before leaving the office or home

Step 2. When you arrive at the survey location, turn off the engine, take eLocust3m with you

Step 3. Tap **All Reports** at the bottom of the Home Page

Step 4. Tap **Basic Report** if you are not an expert user and want to enter basic, minimal data only (locust type, area surveyed or treated) or tap **Pro Report** if you are experienced and will enter complete data on ecology, locust, control and safety

Step 5. Make sure to complete all required fields

Step 6. Take a clear photo close to the locust or, if there are no locusts, an overview of the habitat

Step 7. Tap **Submit** to send the report to your Locust Unit HQ; if there is no network, it will be sent automatically later when you have a connection

Step 8. Your reports are saved in **All Reports** where you can tap on any report to see the details

Step 9. Your reports are also shared in the chat where other users in your country can see them

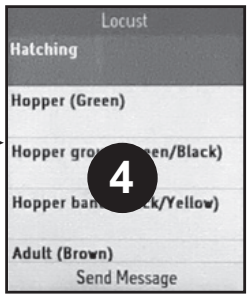
Tap Chat to text and share photos and videos;
Avoid logging in every time by not logging out;
If you forget your password, register as a new user

14. Using eLocust3g

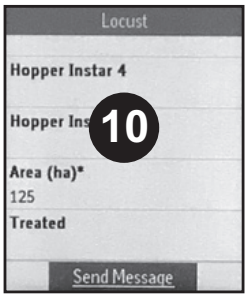
Push button on top of GPS to switch on eL3g and wait for Home Page

Press ◄ then ▲ to navigate to **Forms** then press ✔

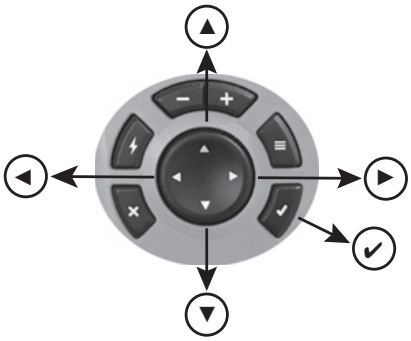
There is one form called **Locust**, press ✔

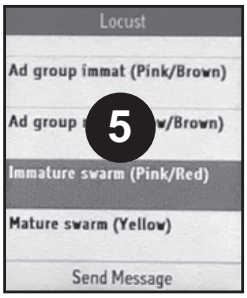


Press ▼ until your find the required stage and colour of the locusts



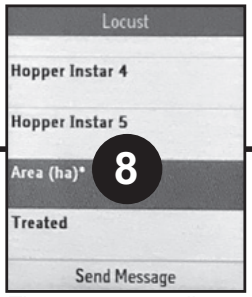
Press ✔ to highlight **Send Message**, then press ✔



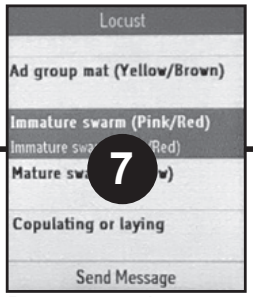


Once the required stage is highlighted, press ✔

Use ▲▼◄► and ✔ to *enter up to 4 numbers*, use ▼ to **Done**, press ✔



Then press ▼ until **Area (ha)** is highlighted, then press ✔



Press ▼▲and repeat steps 5–6 for any other stages or behaviour

Press ▼ to highlight the stage and colour, then press ✔

If no locusts are present, then leave everything blank except for Area surveyed

15. How to report survey results

eLocust3

This is the preferred method used by national locust teams for recording and transmitting complete data and observations from the field in real time via satellite. The data are immediately available on the GeoFlex platform and are sent by email to the Locust Unit HQ during the evening. A copy of the data is saved on the tablet. eLocust3 can also be used with dLocust (drones).

eLocust3m / eLocust3g

Basic and complete data can be recorded in a smartphone app (eLocust3m) while only basic data can be entered into a handheld GPS satellite communicator (eLocust3g). Complete data entry (eLocust3mPRO) should be done by experienced teams during recessions and emergencies. In both cases, the latitude and longitude of the survey or control location is automatically determined. Basic data entry is very simple and requires only brief training. It is ideal for use during emergencies by extra teams who may be less experienced or knowledgable. All data are displayed on a map in a cloud platform and can be downloaded. The data are received in real or near real time at the Locust Unit HQ.

Survey forms

Survey and control data can be recorded on the *FAO Desert Locust Standard Survey/Control Form* (or similar form) and transmitted to the Locust Unit HQ within 1–2 days by HF radio, mobile (photo), fax, email, social media, or in person.

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