

4. Calibration and Application

Topic 4c

How to Use a Knapsack Sprayer

FACT SHEET

4. Calibration and Application

Topic 4c: How to Use a Knapsack Sprayer

The knapsack sprayer is the most popular pesticide application equipment in Africa. However, many accidents happen daily because of the incorrect way of using a knapsack sprayer.

Using a knapsack sprayer involves **three steps**:

1. Preparing for spraying.
2. Application of the pesticides.
3. Aftercare.

1. Preparing for spraying

Before applying pesticides with a knapsack sprayer there are a few important things to do:

1. Read the label to know how to apply the pesticide, the recommended nozzle type, and the application recommendations.
2. Inspect the equipment for leakage, loose fittings, and signs of wear and tear. Repair any problems before spraying.
3. Select the correct nozzle and fit it to the sprayer.
4. Check the weather conditions. Do not spray when it rains (the pesticide will be washed off) or with strong winds (the spray will be blown away).
5. Plan the spray activities in the field: measure the size of the spraying area, measure how many times to refill the knapsack sprayer, and estimate the duration of the application (see topic 13a).
6. Check the protective clothing for signs of wear and tear. Fix any problems before putting it on. Put the protective clothing on.
7. Measure and mix the correct dosage (see topic 13b).

2. Application of the pesticides

You are now in the field and ready to start spraying. There are some important things to keep in mind while working with a knapsack sprayer in the field:

- Walk at a steady pace. If you walk too slow or too fast your rate of application will differ from area to area.
- Pump at a steady pace to allow for constant tank pressure.
- Move the nozzle over the target area in a smooth and constant speed.
- Overlap the previous spray area.

- Constantly check for leaks in the supply line. Stop spraying if you see a leak.
- Monitor the spray pattern of the nozzle. Any changes may indicate a blocked or damaged nozzle.

The do's and don'ts of pesticide application with a knapsack sprayer:

- Do wear protective clothing and equipment at all times.
- Don't apply pesticides when it is windy.
- Don't spray when rain is anticipated.
- Don't eat, drink or smoke while applying pesticides.
- Do wash hand before and after using the bathroom.
- Do keep people and domestic animals away from the field while spraying.
- Do take regular breaks to rest.
- Don't spray during the extreme heat of the day.
- Do concentrate while spraying. Mistakes can be dangerous.
- Don't spray overhead. There will be a high risk of drift and pesticide contact.

3. Aftercare

After spraying in the field, the following steps should be taken:

1. Empty the knapsack sprayer completely. Do not apply remaining spray mix to the target area because you will over-apply. Rather spray it out on the area around your field where pests may also be.
2. Clean the knapsack sprayer by triple rinsing with clean water. Leave your protective clothing on while rinsing.
3. Clean the nozzle with a soft brush.
4. Leave the equipment to dry.
5. Remove your protective clothing.
6. Clean the protective clothing and equipment.
7. Wash yourself properly.

INSTRUCTIONS

4. Calibration and Application

Topic 4c: How to Use a Knapsack Sprayer

Materials needed:

- Flip-sheet board with flip-sheets
- Markers (1 black, 1 blue, 1 green, 1 red)
- Colored cards
- Knapsack sprayer
- Nozzle
- Water (enough to spray and to clean)
- Protective clothes (at least gloves, overalls, and boots)
- Bottle with the label *pesticides*
- Soft brush

Time needed: 1 hour

Preparations:

- ☑ Flip-sheet with the title *How to use a knapsack sprayer*
- ☑ Flip-sheet with the heading *Preparations* and the following points:
 - *Read the label*
 - *Inspect equipment*
 - *Select nozzle*
 - *Check weather conditions*
 - *Plan spraying*
 - *Check protective clothing*
 - *Measure and mix*
- ☑ Flip-sheet with the heading *Spraying* and the following points:
 - *Walk at steady pace*
 - *Pump at steady pace*
 - *Move nozzle at constant speed*
 - *Overlap previous spray*
 - *Check for leaks*
 - *Monitor spray pattern*
- ☑ Flip-sheet with the heading *Aftercare* and the following points:
 - *Empty sprayer*
 - *Clean nozzle*
 - *Dry equipment*
 - *Remove protective clothing*
 - *Clean protective clothing*
 - *Wash yourself*

Note: This session should be done outside.

Set up

- Attention:** Ask the participants to follow you outside.
- Title:** Tell participants the title while showing the flip-sheet with the title: *How to use a knapsack sprayer*.
- Credibility:** Explain your experience in spray equipment.
- Objectives:** To explain how to use a knapsack sprayer to apply pesticides.
- Benefits:** To know how to work with a knapsack sprayer will help you to advise your customers to use the knapsack sprayer correctly.

Direction: During this session, we will focus on how to use a knapsack sprayer. We will not discuss again how to calculate the dosage or how to measure and mix.

Delivery

Explanation, Demonstration, Exercise, and Guidance:

1. Tell participants that the **application of pesticides** with a knapsack sprayer consists of **three steps**:
 - a. Preparation.
 - b. Application of the pesticide.
 - c. Aftercare.
2. Start with the **preparations**. Ask if anyone has an idea what to do during preparations. Let them mention a few steps. Show the flip-sheet with the heading *preparations*. Read a step aloud, and then demonstrate the step (step e and g should just be mentioned, not demonstrated).
 - a. Read the label to know how to apply the pesticide, the recommended nozzle type and the application recommendations.
 - b. Inspect the equipment for leaks, loose fittings, and signs of wear and tear. Repair any problems before spraying.
 - c. Select the correct nozzle and fit it to the sprayer.
 - d. Check the weather conditions. Do not spray when it rains (the pesticide will be washed off) or with strong winds (the spray will be blown away).
 - e. Plan the spray activities in the field. You do not have to do this, just refer to session 13a.
 - f. Check the protective clothing for signs of wear and tear. Fix any problems before putting it on. Put the protective clothing on.
 - g. Measure and mix the correct dosage. You do not have to do this, just refer to session 13b.
3. Continue with the **application**. Ask if anyone has an idea what to do during application. Let them mention a few steps. Show the flip-sheet with the heading *application*. Read a step aloud, and then demonstrate the step:
 - Walk at a steady pace. If you walk too slow or too fast your rate of application will differ from area to area.
 - Pump at a steady pace to allow for constant tank pressure.
 - Move the nozzle over the target area in a smooth and constant speed.
 - Overlap the previous spray area.
 - Constantly check for leaks in the supply line. Stop spraying if you see a leak.
 - Monitor the spray pattern of the nozzle. Any changes may indicate a blocked or damaged nozzle.
4. After the demonstration on application, mention the **do's and don'ts** of application:

- Do wear protective clothing and equipment at all times.
 - Don't apply pesticides when it is windy.
 - Don't spray when rain is anticipated.
 - Don't eat, drink or smoke while applying pesticides.
 - Do wash hand before and after using the bathroom.
 - Do keep people and domestic animals away from the field while spraying.
 - Do take regular breaks to rest.
 - Don't spray during the extreme heat of the day.
 - Do concentrate while spraying. Mistakes can be dangerous.
 - Don't spray overhead. There will be a high risk of drift and pesticide contact.
5. Finish with the **aftercare**. Ask if anyone has an idea what to do during aftercare. Let them mention a few steps. Show the flip-sheet with the heading *aftercare*. Read a step aloud, and then demonstrate the step (step f and g should just be mentioned, not demonstrated):
- a. Empty the knapsack sprayer completely. Do not apply remaining spray mix to the target area because you will over-apply. Instead spray it out on the area around your field where pests may also be.
 - b. Clean the knapsack sprayer by triple rinsing with clean water. Leave your protective clothing on while rinsing.
 - c. Clean the nozzle with a soft brush.
 - d. Leave the equipment to dry.
 - e. Remove your protective clothing.
 - f. Clean the protective clothing and equipment.
 - g. Wash yourself properly.

Finish

Summary: Give a summary by repeating what to do during preparations, applying, and aftercare.

Questions: Ask if anyone has a question or comment.

Evaluation: Ask them what to do as preparation to use a knapsack sprayer. Ask them what to do during application. Ask them what to do for aftercare. Ask them what to do with leftovers spray mixture in the knapsack sprayer.

Next step: This session was the last session on how to use a knapsack sprayer. We have looked at parts of the knapsack sprayer and different nozzles, we have seen how to calculate the correct dosage, how to measure and mix, and now how to apply. Next time when a customer comes in your shop, you can give him proper advice on all these aspects, and avoid over or under application.



Distribute the **fact sheet** to all participants.