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U.S. President's Malaria Initiative

IRS Spray Operator Pocket Guide

AUGUST 2018



U.S. PRESIDENT'S MALARIA INITIATIVE

vectorlink

INTELLIGENT > INNOVATIVE > INTEGRATED

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Abt Associates
6130 Executive Boulevard
Rockville, Maryland 20853
T. 301.347.5000
F. 301.913.9061
www.abtassociates.com

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I. Personal Protective Equipment (PPE)

- Always wear the full set of clean PPE before beginning to mix insecticide or spraying.
- The PPE is composed of:
 - Overalls
 - Helmet with face shield
 - Dust mask
 - Gloves
 - Rubber Boots
 - Neck protection

TIPS:

- Wear the overalls over the boots.
- Wear the gloves over the overall sleeves.
- Inform your Team Leader immediately if any of the PPE items you received does not fit you comfortably, or if any of the equipment is damaged (e.g., torn)



2. Haversack (Bag)

- Do not put anything in your bag except the items you have been issued by your Team Leader or Store Keeper. These items may include:
 - Insecticide
 - Hand towel
 - Spray cards, forms and Pen
 - Spare nozzles and tools for repair of sprayer
 - Filter cloth or sieve
 - Plastic sheet
 - Torch/flashlight
 - Container (e.g., jug) to help with measuring water while mixing insecticide

TIPS:

- Do not carry any personal items in the haversack.
- Keep the haversack within sight and under your control at all times.
- Return the haversack to the store at the end of each work day.



3. Spray Equipment

Sprayers have to meet the specifications recommended by the World Health Organization, including the requirement to be installed with a low pressure control flow valve (CFV). Two types of compression sprayers are presently being used on the PMI VectorLink project.

The IK Vector
Control Super
(Goizper)



The Hudson
Xpert-type
sprayer



4. Health & Fitness

- Have a good night's rest before each day.
- Have a good breakfast before you start work.
- Make sure that you drink plenty of water or juice before reporting for work.

CAUTION:

- Inform your Team Leader immediately if you experience any of the following in the course of the day:
 - Difficulty breathing
 - Headache
 - Fatigue
 - Eye irritation
 - Skin irritation
 - Nausea
 - Dizziness
 - Confusion
 - Weakness
 - Excessive sweating
 - Any other form of ill health or discomfort

5. Safety Precautions

- Do not eat or smoke while on duty. When you have to drink water, you may do so without using your hands when drinking water is provided by homeowners, using a clean cup. If the homeowner cannot help, you should take off your gloves and wash your hands with soap and water before drinking.
- If any part of your body comes into contact with insecticide, wash it off with soap and water immediately and report the matter to your Team Leader or Supervisor.
- De-pressurize your sprayer while moving from one household to the next, and while travelling through the community.

6. First Aid

Notify your Team Leader or Supervisor immediately if any of the following occur:

- Inhalation of insecticide mist
 - Exit the house immediately.
 - Sit down in the shade.
 - Your team leader or supervisor will arrange for you to be taken to a health center.
- Skin contact
 - Take off all contaminated clothing immediately.
 - Wash off all parts of the body that have contacted the insecticide immediately with soap and plenty of water.
 - If skin irritation persists, inform your Team Leader or Supervisor, who will arrange to take you to a Health Center.
- Eye contact
 - Rinse eyes immediately with clean water, also under the eyelids, for at least 15 minutes.
 - You will be taken to a Health Center for examination.

7. Household Messages

- Be polite, courteous and respectful when speaking with members of the community.
- Seek the permission or consent of an adult household member before you enter any homes.
- Before spraying, make sure that children and animals are kept at least 10 meters away from the house during insecticide mixing and spraying.
- Mix insecticide in a safe and convenient place outside of the house.
- Inform beneficiaries that:
 - They should wait at least 2 hours before entering any house that has been sprayed, to allow the walls to dry.
 - After 2 hours, they should open the doors and windows to let in air for 30 minutes.
 - Before people and animals are allowed to enter the home, the floor should be swept.
 - Any insects or dirt should be thrown into a pit latrine, or buried in a pit 50cm deep.
 - Domestic animals and pets should not be allowed to feed on any dead insects from the sprayed home.
 - The sprayed walls should not be cleaned, painted or plastered for at least 9 months

8. Preparing Houses for Spraying

- As soon as you arrive in the community, alert beneficiaries of your presence so they can prepare their houses. Advise the beneficiaries to tether or put away any animals, including guard dogs.
- Ensure that all household items that can be moved are removed from the house before you begin spraying. Such items would include:
 - Food and water
 - Any food and water containers
 - Cooking utensils
 - Items hanging on walls
 - Clothing
 - Toys
 - Furniture
 - Mosquito nets
- Keep items at least 10 meters away from the outer wall of the house
- Items that cannot be removed should be moved to the center of the room and covered with a plastic sheet
- Do not spray any rooms that are occupied by people unable to move out, such as the sick.
- Keep all doors and windows closed as you spray the home. The exception being the singular window or door that you may leave slightly open for illumination in addition to your flashlight/torch

WALL HANGINGS, POSTERS, PICTURES AND OTHER ITEMS ON THE WALL

- Determine whether the items are kept permanently on the wall or not.
- Spray over items that are fixed on the wall for the long term.
- If the item can be lifted off the wall, you should also spray its underside, and the wall surface under it.
 - If you encounter immovable household items positioned close to the wall, introduce the lance between the wall and the object to spray. (Note that it may not be possible to maintain the correct distance).
- Put away any household items outside the houses that may be stored close to the eave.



9. Mixing Insecticide

- The final volume of diluted insecticide should be 7.5 liters.
- When mixing, place the sprayer on top of the plastic sheet and on firm ground outside the house, away from any household items.
- Use a filter cloth to sieve all the water being introduced into the spray tank.

FOR LIQUID FORMULATIONS (SUCH AS ACTELIC 300CS):

1. Introduce 3 liters of water through the filter cloth or sieve into the spray tank.
2. Remove the sieve and then completely empty the content of the insecticide bottle into the tank. Remember to shake the bottle before opening it.
3. Use the filter cloth to sieve the water you will use to rinse the empty insecticide bottle

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4. Rinse the empty insecticide bottle into the spray tank using half a liter of water. Repeat this two more times to make it a total of 3 rinses.
 5. Close the empty bottle tightly and put it back in your haversack
 6. Close the lid of the sprayer
 7. Pump the sprayer with 5 full strokes
 8. Pick up the sprayer with both hands. Hold it by the tank body and vigorously shake it side to side, 10 times
 9. Place the sprayer back on the plastic sheet
 10. De-pressurize the sprayer
 11. Open the lid and using the filter cloth, add water up to the 7.5 liter mark. (If necessary, use your flashlight to confirm the position of the 7.5l marking)
 12. Place your foot firmly on the sprayer's foot rest with the sprayer to the side of your body
 13. Pump the sprayer
 - a. to the 55psi mark if using a Hudson sprayer
 - b. or, if using a Goizper sprayer, till the safety valve begins releasing pressure
 14. Listen for leakages as you pressurize the sprayer, and notify your team leader if you notice that pressure is escaping from the tank

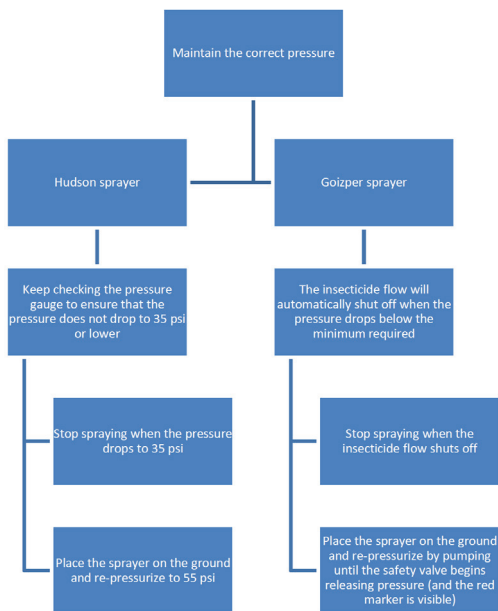
FOR POWDERS AND GRANULES (SUCH AS SUMISHIELD 50WG):

1. Introduce 3 liters of water through the filter cloth or sieve into the spray tank.
2. Remove the sieve and then completely empty the contents of the insecticide sachet into the tank
3. Fold the empty sachet in half and put it back in your haversack
4. Close the lid of the sprayer
5. Pump the sprayer with 5 full strokes
6. Pick up the sprayer with both hands. Hold it by the tank body and vigorously shake it side to side, 10 times
7. Place the sprayer back on the plastic sheet
8. De-pressurize the sprayer
9. Open the lid and using the filter cloth, add water up to the 7.5 liter mark. (If necessary, use your flashlight to confirm the position of the 7.5l marking)
10. Place your foot firmly on the sprayer's foot rest with the sprayer to the side of your body
11. Pump the sprayer
 - a. to the 55psi mark if using a Hudson sprayer
 - b. or, if using a Goizper sprayer, till the safety valve begins releasing pressure and the green mark shows
12. Listen for leakages as you pressurize the sprayer, and notify your team leader if you notice that pressure is escaping from the tank.

10. Spray Technique

- Correctly wear the sprayer, using the shoulder strap(s). If you are using the Hudson-type sprayer, make sure you are able to read the pressure gauge.
- Ensure that there is adequate lighting before you begin applying insecticide. Use your free hand to hold the flashlight to light the work area. If you require more light, keep one door or window slightly open to let in natural light. (Ensure that you do not spray directly into the opening).
- Hold the trigger with one hand. The tip of the nozzle of your sprayer should be 45 cm away from the wall when you hold the lance horizontal to the wall (“middle position”). This will ensure you that you achieve the correct swath width of 75 cm.
- Begin spraying at the top of the wall (“top position”), moving your arm in a smooth pattern through the “middle position” to the “bottom position”.
- Maintain the correct speed (rhythm) when spraying. As you were trained, cover 2 meters of wall surface in 5 seconds.

- After covering the first swath, take a step to the right, and resume spraying from the bottom to the top.
- Ensure that you make a 5 cm overlap with each successive swath.
- Always move towards the right of the surface to be sprayed. The exception being if you are left handed and maybe more comfortable spraying towards the left of the spray surface.
- Shake the sprayer vigorously after every 10 successive swaths.



II. Spraying Ceilings

- Spray the eligible ceiling after completing all the walls of the house.
- Keep the nozzle tip 45 cm away from the surface, and spray with the same speed as for the walls.
- Hold the lance in a vertical position at arms-length.
- Move backwards as you spray to avoid coming into contact with sprayed insecticide.
- Repeat this in swaths until the entire ceiling is covered with insecticide.
- Please remember that only sprayable surfaces such as wood and thatch can be sprayed. Zinc and metal surfaces should not be sprayed.

12. Spraying Eaves

- Spray the eaves last, after completing the interior of the house.
- Clear the verandah/porch of any household items or obstacles that may get in your way as you spray.
- Point the lance in a vertical direction as you do when spraying ceilings. Point the nozzle to the eave.
- Do not spray the exterior of the wall surface.
- Keep the tip of the nozzle under the eave as you spray.
- Spray with the swath parallel to the wall. (Spray along, not towards, or away from, the wall).
- If you detect some wind, spray towards the same direction as the wind.
- Spray with the same rhythm/speed as you do with the other surfaces.



Caution!

When operating the sprayer, pay attention to the following and report any issues to your Team Leader or Supervisor:

- Leakages
- Blockages
- Worn nozzles (signified by irregular and uneven flow patterns)
- Stop spraying if anyone enters the house, or if people or animals come within 10 meters while you are spraying eaves.

13. Trouble-shooting Blockages in Equipment

If the sprayer ceases to spray, it may be a result of either of 2 things:

- a. That the pressure has dropped below the level allowable by the CFV; OR
- b. That there is a blockage in the equipment

To ensure that a drop in pressure is not the issue:

- First check the gauge, if using a Hudson type sprayer. If the gauge has gone below the minimum working pressure mark, then re-pressurize to 55psi.
- If using the Goizper type of sprayer, pressurize until the safety valve begins releasing pressure and turns green.
- If in spite of pressurizing, the equipment still is unable to spray, there likely is a blockage. The commonest point of blockage is the nozzle, followed by the CFV (if using an external red CFV).
- To unblock a nozzle, carry out the following steps:
 - De-pressurize your sprayer
 - Spread the plastic sheet on the ground outside the structure being sprayed
 - Pour some clean water into your container/jug and place it on the sheet. Unscrew and insert the nozzle in the container.

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- Using the soft tooth brush provided to your team leader, gently brush the tip of the nozzle repeatedly. Never insert any hard object into the nozzle tip as it will become damaged.
 - If in spite of this step the nozzle still doesn't work, request for a new nozzle from your Team Leader.
 - To unblock a CFV, carry out the following steps:
 - De-pressurize your sprayer
 - Spread the plastic sheet on the ground outside of the structure being sprayed
 - Pour some clean water into your container/jug and place it on the sheet. Unscrew and insert the CFV in the container.
 - Scoop water into the hollow of the CFV having a tiny metal valve
 - Using a screw driver (from the kit of your Team Leader), press the metal valve till water drips out from the other end of the CFV. Repeat the process three times
 - Re-assemble the CFV and the nozzle and pressurize the equipment before attempting to spray

14. After Spraying a House

- Ensure all the doors and windows remain closed.
- De-pressurize the sprayer.
- Remind the household members of the household safety guidelines.
- Complete the data cards or forms as you were trained.
- Mark the sprayed structure appropriately.



15. Handling Leftover Insecticide & Contaminated Waste

- Empty insecticide packaging (containers), and used dust masks, are considered to be contaminated waste.
- Return all unused insecticide sachets or bottles to the Storekeeper through your Team Leader at the end of each day. Ensure that all the insecticide you return to the store is recorded.
- Inform the Team Leader if you have any mixed insecticide left over in your sprayer at the end of the day.
- Pour any mixed insecticide in your sprayer returned to the operating site into barrel number 1.

**HAND OVER ALL EMPTY INSECTICIDE SACHETS/
BOTTLES AND USED DUST MASKS TO THE
STOREKEEPER THROUGH YOUR TEAM LEADER
AT THE END OF THE DAY BEFORE GOING TO THE
WASH AREA..**

16. The Progressive (Triple) Rinse Procedure

For end of the day clean-up for fixed soak pit:

- Wear full PPE when carrying out the progressive (triple) rinse procedure.
- Pour all leftover insecticide from the field into barrel 1, which should always be covered
- From barrel 2, take 2 liters of water and pour into the spray tank
- Pressurize the sprayer with to allow the CFV to work and shake it, then discharge the some of the solution into barrel 3 by pressing the trigger and discharging through the nozzle
- De-pressurize the sprayer and empty the remaining solution into barrel 3
- Take 2 liters of water from barrel 4, repeat the same process of pressurizing and agitating the sprayer, discharging the some of the liquid into barrel 5 by pressing the trigger and discharging through the nozzle before emptying the remainder into barrel 5.
- Take 2 liters of water from barrel 6, repeat the same process of pressurizing and agitating the sprayer, discharging the some of the liquid into barrel 7 by pressing the trigger and discharging through the nozzle before emptying the remainder into barrel 7.
- After barrel 7, dismantle the CFV, nozzle and strainer and use the clean water from the additional container to clean them with the toothbrush (nozzle and strainer) and screw driver for CFV.

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- After unscrewing the nozzle and CFV, use the CFV to scoop water from the additional container using the hollow side that has a metal tip at the center. Press the screw driver against this metal tip until all the scooped water flows out from the other side of the valve. Repeat this process three times.
 - Thereafter, reassemble the CFV, nozzle, and strainer.
 - Wash your face shield, gloves, boots and plastic sheet using soap, and water from the additional container.
 - Hang the spray tank upside down on the pump hanger.
 - Remove your PPE and take a bath before going home.
 - Hand over your overalls to be washed
 - Take a full-body shower or bath, using soap, in the designated bathing area at the operating site.


If using a mobile soak pit:

- Pour all leftover insecticide from the field into barrel 1, which should always be covered
- From barrel 2, take 2 liters of water and pour into the spray tank
- Pressurize the sprayer with to allow the CFV to work and shake it, then discharge the some of the solution into barrel 1 by pressing the trigger and discharging through the nozzle
- De-pressurize the sprayer and empty the remaining solution into barrel 1

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- Take 2 liters of water from barrel 3, repeat the same process of pressurizing and agitating the sprayer, discharging the some of the liquid into barrel 1 by pressing the trigger and discharging through the nozzle before emptying the remainder into barrel 1.
 - Take 2 liters of water from barrel 4, repeat the same process of pressurizing and agitating the sprayer, discharging the some of the liquid into barrel 1 by pressing the trigger and discharging through the nozzle before emptying the remainder into barrel 1.
 - After barrel 4, dismantle the CFV, nozzle and strainer and use the clean water from barrel 4 to clean them with the toothbrush (nozzle and strainer) and screw driver for CFV.
 - After unscrewing the nozzle and CFV, use the CFV to scoop water from the additional container using the hollow side that has a metal tip at the center. Press the screw driver against this metal tip until all the scooped water flows out from the other side of the valve. Repeat this process three times.
 - Thereafter, reassemble the CFV, nozzle, and strainer.
 - Wash your face shield, gloves, boots and plastic sheet using soap, and water from barrel 4.
 - Distribute waste water from barrel 1 into spray tanks and leave on the side.
 - Remove your PPE and wash your hands and face before leaving the wash area.
 - Hand over your overalls to be sent to the operations site.

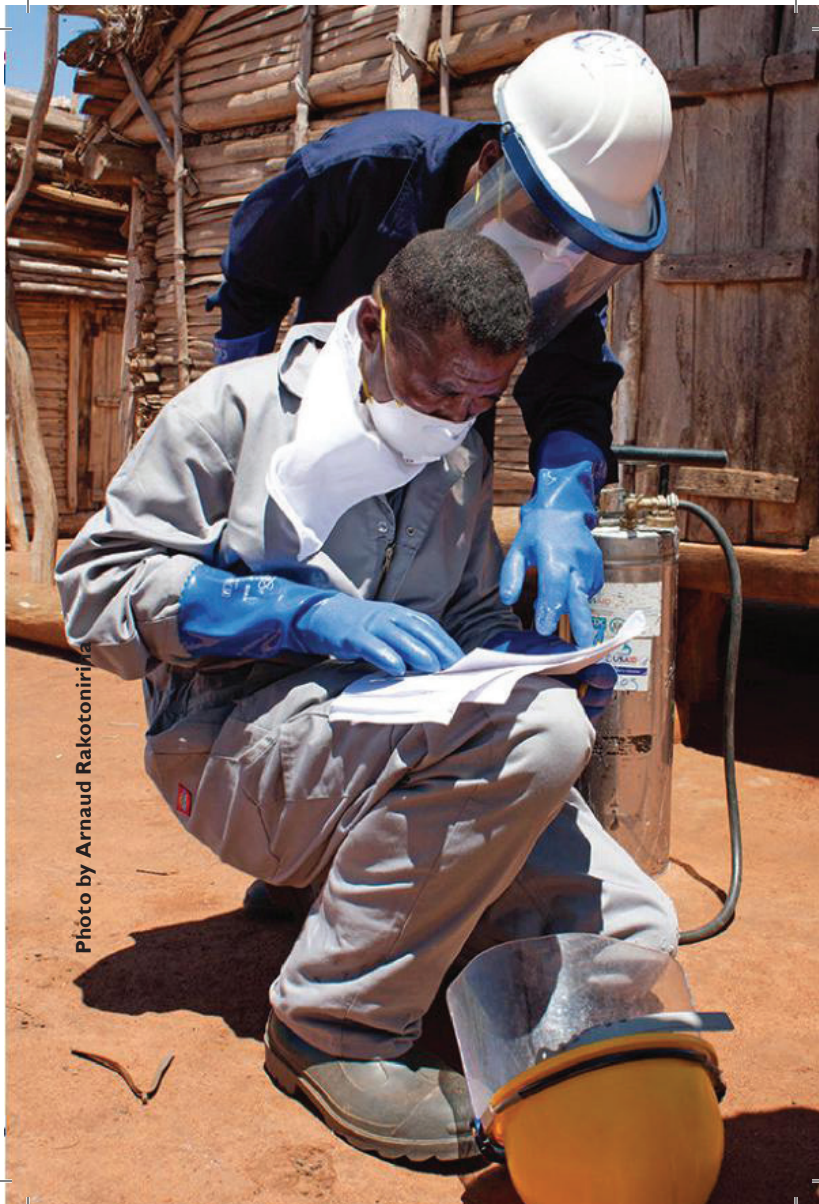
17. Performance Targets

- You should know the average number of structures you are expected to spray per day. If you are not sure of the number, ask your Team Leader.
- My daily target number of structures to spray is ____
- You should know the average number of structures each sachet (or bottle) of insecticide is expected to cover.
- Each sachet (or bottle) of insecticide is expected to cover an average of ____ structures.



**Remember, your contribution
is helping protect our
community from malaria!**

Photo by Arnaud Rakotonirina





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