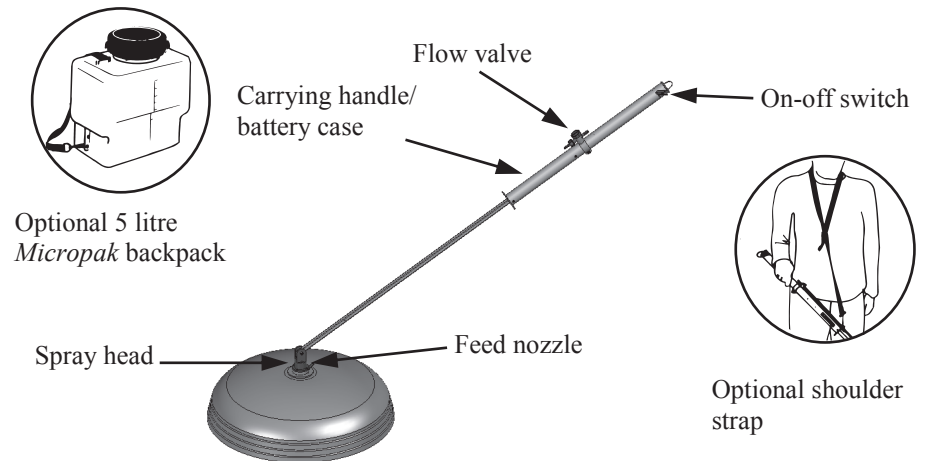


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DESCRIPTION

The HERBI-600S is a simple robust hand-held spinning disc Controlled Droplet Application (CDA) sprayer powered by 4 torch (D-cell/R20) batteries, with one set of good quality batteries giving over forty hours spraying time. It is designed to apply herbicides in a 1.2m wide band at low volumes (10 to 30 litres/hectare). A governed electric motor spins the atomiser disc at a constant 2,000 rpm to produce uniform spray droplets of around 250 micron; large enough to minimise any risk of spray drift. Liquid is fed by gravity through colour coded feed nozzles. The HERBI-600S can apply herbicides to borders, pathways, ditches and larger areas by making a series of consecutive spray passes. The weight of the machine ready to spray, with the *Micropak* 5 litre backpack, is 7kgs.



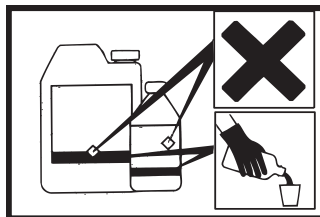
Specially designed Micron *Micropak* backpacks and a shoulder strap are available for use with the HERBI-600S. Safety

Using agrochemicals is a hazardous process. Operators should comply with all relevant legislation and/or regulations governing the use of agrochemicals and should use appropriate personal protective equipment (see 'OPERATOR PROTECTION'). **Never** use the HERBI-600S in potentially explosive atmospheres or spray flammable liquid through it.

The HERBI-600S can be used with most conventional herbicides, as well as specific CDA formulations (only available in some countries) to provide a closed transfer system to improve operator safety.

Always read the product label carefully to discover:-

- ◆ approved applications
- ◆ maximum dose rates
- ◆ maximum number of treatments
- ◆ operator protection required
- ◆ necessary environmental protection measures



N.B. 'Dose rate' refers to the amount of chemical applied per hectare.

Never eat, drink, or smoke when working with agrochemicals. After using agrochemicals or handling equipment wash your hands thoroughly. Keep people (especially children) and animals out of areas being sprayed.

Always store agrochemicals safely to protect people and animals, and to safeguard the environment (take special care to avoid water pollution). See 'SPRAYING' sections for guidelines on safe use of the HERBI-600S in operation.

OPERATOR PROTECTION

Always wear the protective clothing items listed on the product label for mixing and filling. The **minimum** protective clothing required for **spraying** with the HERBI-600S is:

- ◆ rubber gloves
- ◆ boots/shoes and long trousers
- ◆ eye protection
- ◆ long sleeved shirt



DECLARATION OF CONFORMITY

Name of manufacturer or supplier: Micron Sprayers Ltd.
Full postal address: Bromyard Industrial Estate,
BROMYARD, Herefordshire
Country of origin: England
Post code: HR7 4HS
Description of Product: Battery powered, hand-held
agricultural spraying
machine.
Name and model number of machine: HERBI-600S
Place of Issue: Bromyard, England
Name of authorised representative: G. S. Povey
Position of authorised Representative: Joint Managing Director

DECLARATION:

I declare as the authorised Representative, that the above information in relation to the supply/manufacture of this product is in conformity with the requirements of the 2006/42/EC Machinery Directive, the EMC Directive 2004/108/EC and complies with the relevant essential health and safety requirements.

Signature of authorised Representative:

TROUBLESHOOTING

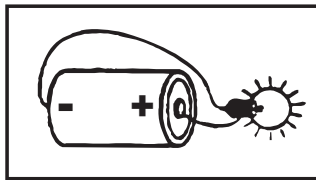
A) Atomiser disc spins but does not spray or sprays irregularly. Check:

- The feed nozzle. If the feed nozzle is blocked remove and soak in soapy water. **Never** blow through the nozzle with your mouth. Check that the feed nozzle gives a flow rate within the operating range.
- The atomiser is clean and undamaged. Clean or replace.
- The flow valve for blockage. Rinse through with soapy water.

B) Atomiser disc fails to spin or spins unevenly. Check:

- That the batteries are fitted correctly.
- The condition of the batteries. Replace if necessary.
- That electrical terminals and contact points are clean and that electrical wires are not broken or corroded.
- If the atomiser disc is rubbing on the motor base plate or the motor shaft is bent. Replace the disc or motor if necessary.
- The motor for corrosion or obvious signs of wear. Replace if necessary.

N.B. Battery condition can be checked with a torch (or a torch light bulb and electrical wire).

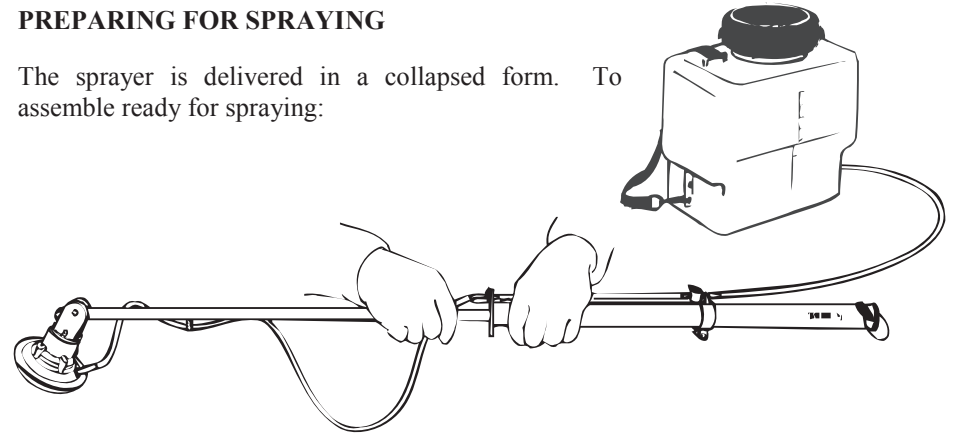


Note:

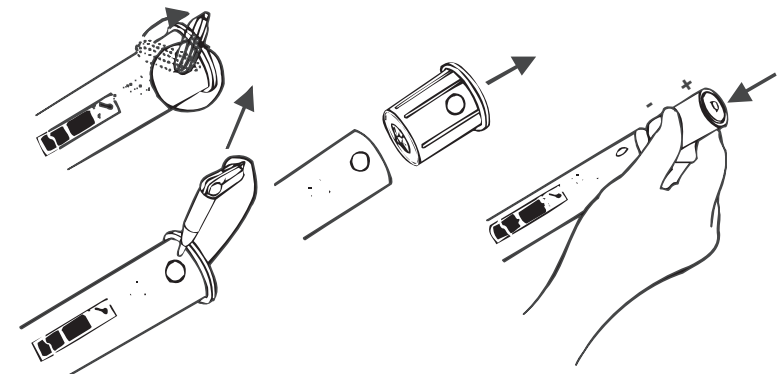
- a) Acoustic information: the sound pressure level at the operator's ear should not exceed 70 dB(A).
- b) Vibration: the weighted RMS acceleration value at the hands when using this machine should not exceed 2.5 m/sec².

PREPARING FOR SPRAYING

The sprayer is delivered in a collapsed form. To assemble ready for spraying:



- 1) Extend the sprayer and securely connect the feed tube to the flow valve. Instructions on assembling Micron *Micropak* backpacks are contained in the tank. The shoulder strap (if supplied) should be connected to the battery case end cap. Check by hand that the atomiser disc spins freely.

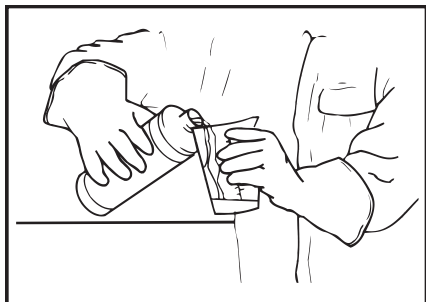


- 2) Remove the switch end piece as shown on the label.
- 3) Insert four batteries (D-cell/R20) negative, i.e. flat, end first.

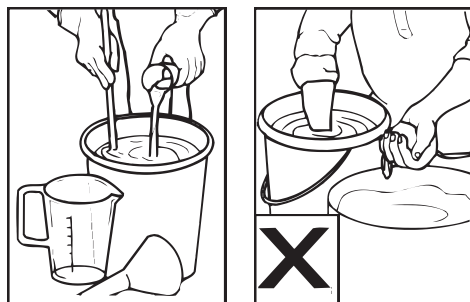
N.B. Before spraying for the first time with the HERBI-600S, the spray pattern produced should be checked using only water (see 'BEFORE SPRAYING').

MIXING, FILLING AND CALIBRATION

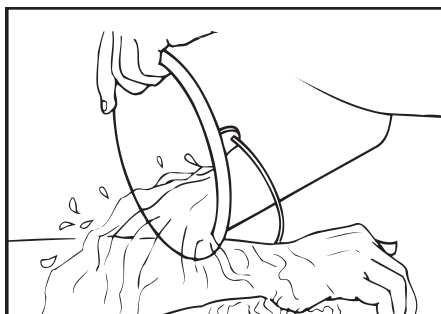
Mixing and filling is generally the most hazardous process in the spraying operation. **Always** follow the label instructions. **Always** use a filter (fitted in the Micron *Miropak* backpacks) and use a funnel if filling a container with a small neck. **Only** mix enough spray for the area to be treated thereby avoiding the need for disposal of unused spray mix.



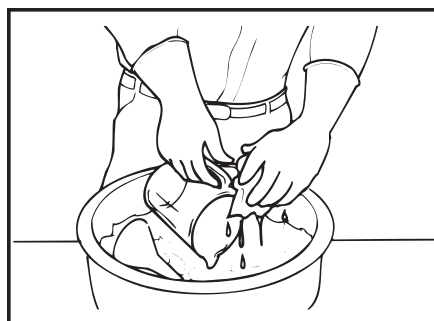
Always wear gloves when handling agrochemicals and equipment.



Always use the correct equipment when mixing and measuring.



Always wash off any skin contamination



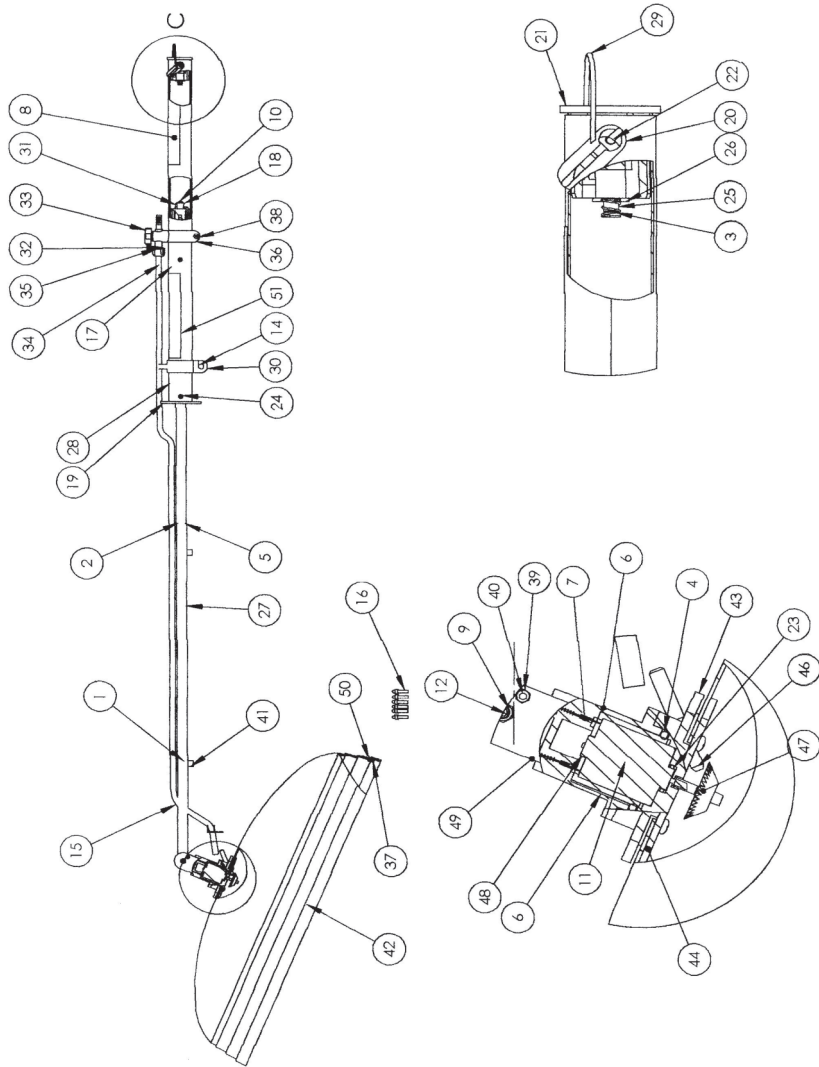
Always clean all equipment after use.

With the HERBI-600 herbicides are usually applied in around 20 litres total spray volume per hectare, except for glyphosate which can be applied at volumes as low as 10 litres per hectare. These are lower volumes than recommended for high volume application with knapsack sprayers.

HERBI-600S PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION
1	3456	SCREW, NO.6 X 1/4" S/T (B)
2	4134	ELECTRIC WIRE, BLACK (THICK) - 1.24M
3	4256	SPRING 5/16" O.D
4	4344	O'RING
5	4368	ELECTRIC WIRE, RED (THICK) - 1.315M
6	4449/G	MOTOR HOUSING
7	4457	SPRING
8	4460	LABEL BATTERY ON/OFF
9	4516	NUT, 3/16" WHIT, NYLOC
10	4646	SCREW S/T No.6 x 3/8" PZ. FL.HD. AB
11	4647	SCREW S/T No.6 x 3/8" SELF TAPPING F/H
12	4817	SCREW 3/16" x 1-18
13	4907	WING NUT
14	4915	SCREW M5 x 16
15	4993/120.5	TUBE, (PVC) 6MM I.D. X 9MM O.D. - 1.205M
16	5278	CABLE TIE
17	5363	SPRING, BATTERY CASE
18	5375B	CENTRE CONNECTOR
19	5376	BATTERY CASE END CAP
20	5391	SWITCH
21	5392A	SWITCH END PIECE
22	5397	SWITCH SCREW BRASS
23	5398	O'RING
24	5399	SCREW S/T No.6 x 3/8" PZ PAN HD.B
25	5401	RIVET 1/4" DIA x 1" RD HEAD
26	5402	WASHER 1/4" STARLOCK
27	5446	EXTENSION TUBE, 1.15M
28	5447	BATTERY CASE
29	5451	RETAINING STRAP
30	5459	LABEL, HERBI-4
31	5466	STRAP RETAINING CLAMP
32	5575	RING TERMINAL
33	5776	TAP
34	5777	VALVE SPIGOT
35	5778	HOSE CONNECTOR 6MM
36	5779	UNION NUT
37	5780	VALVE CLAMP
38	5956	SCREW M5 x 12 PT
39	5976	NUT M3 NYLOC
40	5978	SCREW M3 X 30 CH/HD
41	6804	CLIP. P 9MM
42	6973A	COVER
43	7120	FRONT PLATE
44	7121	RETAINING PLUG
45	7122	SLEEVE
46	7123	FEED NOZZLE (BLUE)
47	7124	ATOMISER DISC
48	7125	MOTOR HERBI 600S
49	7201	SCREW S/T NO.6 x 1/2" PZ PAN HD AB
50	7477	BAR 4mm S/S
51	7478	LABEL HERBI-4
	5107D	STRAP

HERBI-600S PARTS DRAWING

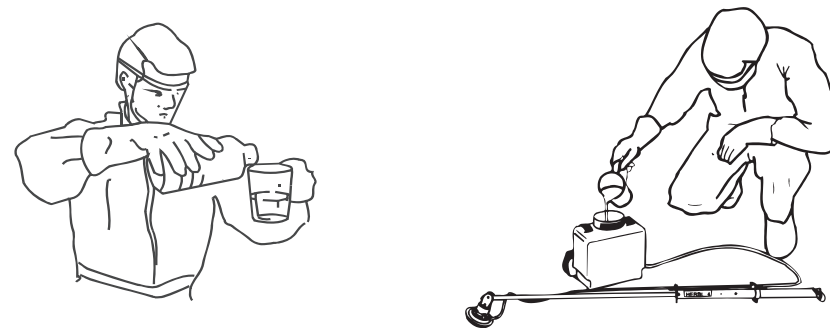


Do not use herbicide concentrations greater than the maximum recommended on the label (unless specific training or recommendations have been given) if the label:

- a) specifically prohibits use of 'Reduced Volumes' i.e. increased concentrations;
- b) has a statutory requirement for use of personal protective equipment when using the diluted product at high volumes (N.B. this will appear in the statutory box on the label);
or
- c) carries one of the following hazard ratings: 'very toxic', 'toxic' or 'corrosive' or carries the warning 'risk of serious damage to the eyes' e.g. paraquat (Gramoxone) which is classified as toxic should not therefore be used through the HERBI-600S at concentrations greater than recommended on the label.

Micron do not generally recommend using spray mixes of more than ten times the maximum concentration recommended for high volume application with knapsack sprayers. The safest product and lowest dose rate appropriate for the treatment should be used at all times.

To prepare the spray mix first read the product label to determine the quantity of product to be applied per hectare e.g. 2 litres of glyphosate per hectare. Then determine the total spray volume to be applied per hectare with the Herbi-4 i.e. 10 or 20 litres per hectare. Calculate the ratio of product in water e.g. 2 litres glyphosate + 8 litres water = 10 litre mix = 1: 4. Use this ratio to prepare the correct dose for the spray tank or bottle e.g. with a 5 litre backpack mix 1 litre glyphosate with 4 litre of water.



Measure out the exact amount of product.

Half fill the tank with clean water. Check for leaks. Add the measured product.

Never use leaking equipment. Take care to avoid spillage when filling or lifting the tank.

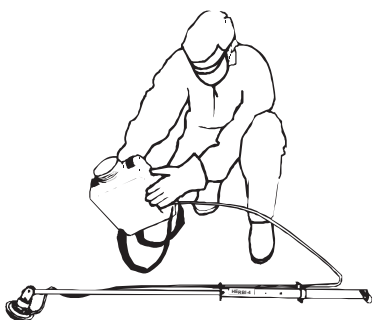
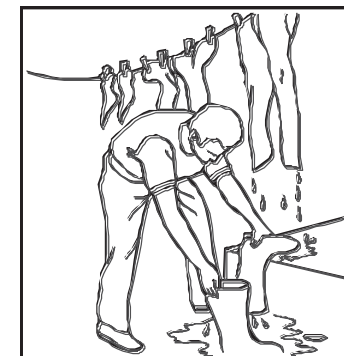
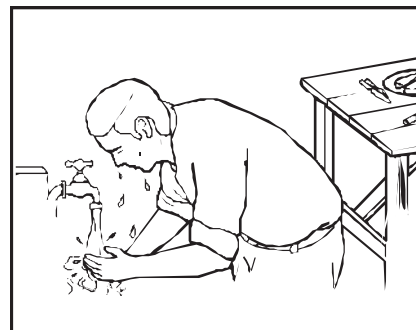


Fill the tank.

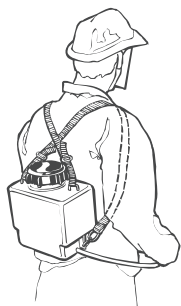


Wipe the tank with a dry cloth

3. After working with agrochemicals, or handling spraying equipment, **always** thoroughly wash hands and exposed skin. All protective clothing should be washed separately from other clothing and stored. Contaminated gloves should be washed inside and out.



Mix well by gently shaking the tank.



Place the tank on the operator's back.

STORAGE

Before storing the HERBI-600S for long periods disassemble the sprayer by removing the four screws in the battery case and clean all electrical contacts with a wire brush or similar. Reassemble and with the sprayer in the collapsed position i.e. batteries removed, store in a dry place away from direct sunlight. Batteries should be stored in a dry cool place.

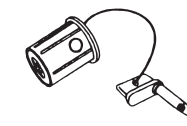
Examples of mixing spray – for 1 hectare

a) glyphosate (360 g/l)	2 litres
add water:	<u>+8 litres</u>
Total volume:	10 litres
i.e. 1 part glyphosate :	4 parts water

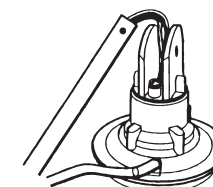
b) 2,4-D (500 g/l)	3 litres
add water:	<u>+17 litres</u>
Total volume:	20 litres
i.e. 3 parts 2,4-D :	17 parts water



remove batteries



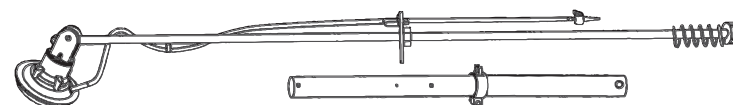
clean switch contacts



clean terminals

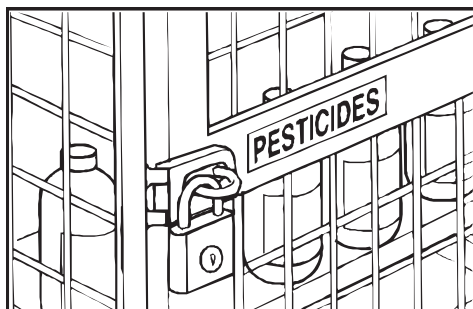


check spring

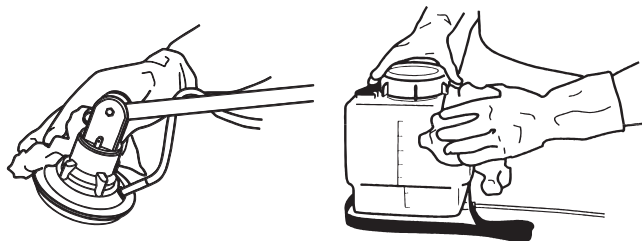
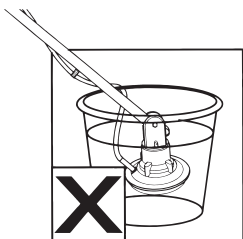


AFTER SPRAYING

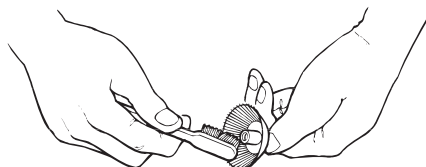
1. Dispose of any surplus spray mix according to the product approval. Store products safely, locked up and out of the reach of children.



2. It is **essential** to clean the sprayer and tank thoroughly using water and detergent after use. **Never** immerse the spray head in water or under a tap, since this will destroy the electric motor. A water and detergent mix should be put in the tank, swilled around, and then sprayed out onto the treated area of waste ground. The sprayer and tank should be wiped down externally using a cloth.



Periodically remove the atomiser disc with a pair of pliers and clean with a soft brush



The table below indicates the relationship between total spray volume, flow rate and walking speed for the HERBI-600S as per the following formula:

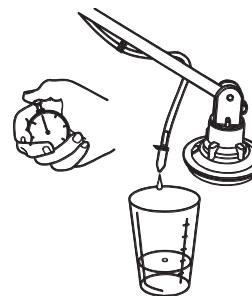
$$\text{Flow rate (ml/min)} = 6 \times \text{total spray volume (l/ha)} \times \text{walking speed (m/s)} \times \text{band width (m)}$$

Total spray volume (l/ha)	Band width (m)	Feed nozzle	Flow rate (ml/min)	Walking speed (m/s)
10 (i.e. glyphosate)	1.2	Blue	72	1
20 (i.e. other herbicides)	1.2	Blue	72	0.5

Note: The flow rates in this table were measured with the spray head 65cm below the level of the liquid in the tank, using water only. The flow rate will vary with differences in this height and the viscosity of the spray mix.

CALIBRATION

The actual flow rate should be checked holding the HERBI-600S in the spraying position. Remove the feed nozzle from the spray head by twisting and pulling out, then, once liquid has reached the feed nozzle, allow the liquid to flow into a suitable container for one minute and measure the volume dispensed. If the flow rate is **not** in the recommended flow rate range, it is preferable to walk more slowly or more quickly to achieve the required spray volume than to use higher flow rates.



Example: Required spray volume rate = 20 l/ha; Flow rate measured = 100 ml/min

$$\text{Walking speed (m/s)} = \frac{\text{Flow rate (ml/min)}}{6 \times 1.2 \times \text{total spray volume (l/ha)}} = \frac{100}{7.2 \times 20} = 0.7$$

i.e. 0.7 m/s or 42 metres in one minute (0.7m x 60s)
Mark out a distance of 42 metres and practice walking it in one minute.

BEFORE SPRAYING

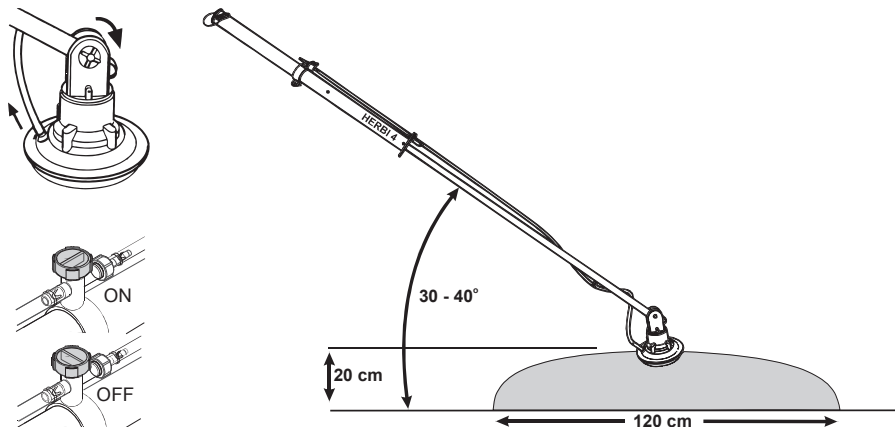
Check the wind speed and direction (below 5 kph) is safest. Take special care to avoid drift by keeping the spray head as low as possible. **Never** spray into the wind and avoid walking into the spray. **Always** keep the spray head at least 60cm from any part of the body to avoid direct contamination by the spray.

Before spraying for the first time use water **only** to check the spray pattern produced. Put some clean water in the tank and add a small amount of detergent. Check for leaks. Switch on the sprayer and then open the flow valve. Spray on one spot, preferably on clean dry concrete, for around 30 seconds with the spray head held about 20cm above the ground; a wet ring 1.2m wide should appear on the ground. Practice using the sprayer by walking along a few metres and then stopping spraying (see 'TO STOP SPRAYING').

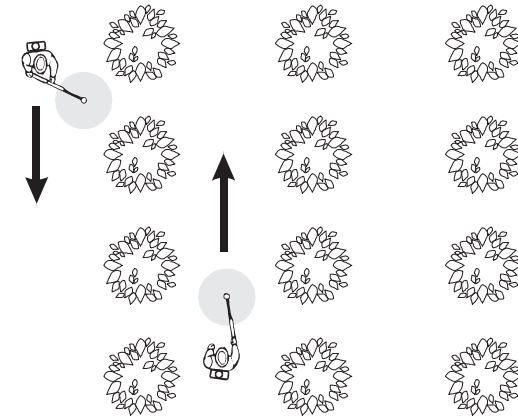
TO START SPRAYING

Hold the spray head about 20cm above the ground or weed foliage. Switch on the sprayer, check the atomiser disc starts spinning (**never** touch the atomiser disc when spinning or hold the spray head too close to the operator) and then open the flow valve. Start walking immediately the spray liquid reaches the feed nozzle.

The HERBI-600 is normally held at an angle of around 35° to 40° to the ground with the head inclined slightly away from the operator. **Do not** spray with the HERBI-600 held on the shoulder, since spray may contaminate the operator. N.B. the machine will not spray with the spray head above the level of liquid in the tank.

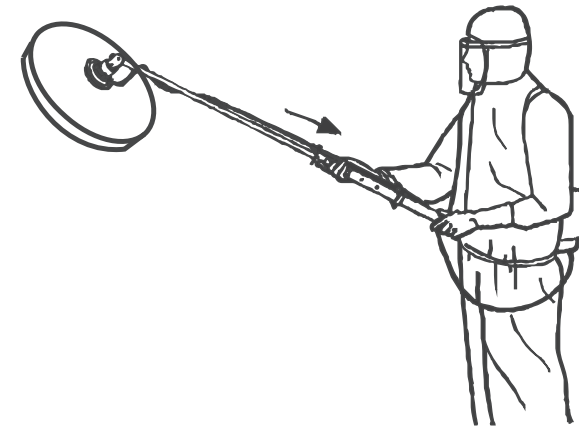


It is best to hold the HERBI-600S to the side or the rear so that the operator does not have to walk over the treated area.



TO STOP SPRAYING

Close the flow valve and then switch off the sprayer. When the atomiser disc has stopped spinning raise the sprayer to an angle of 45° (see below). **Never** raise the spray head until the atomiser disc has stopped spinning. Then open the flow valve and drain any remaining liquid in the feed tube back into the tank (by raising the feed tube above the level of liquid in the tank). Then close the flow valve.



For ease of transport the tank can be disconnected (use the flow valve to isolate any liquid left in a backpack) and the sprayer collapsed (by removing the batteries).