

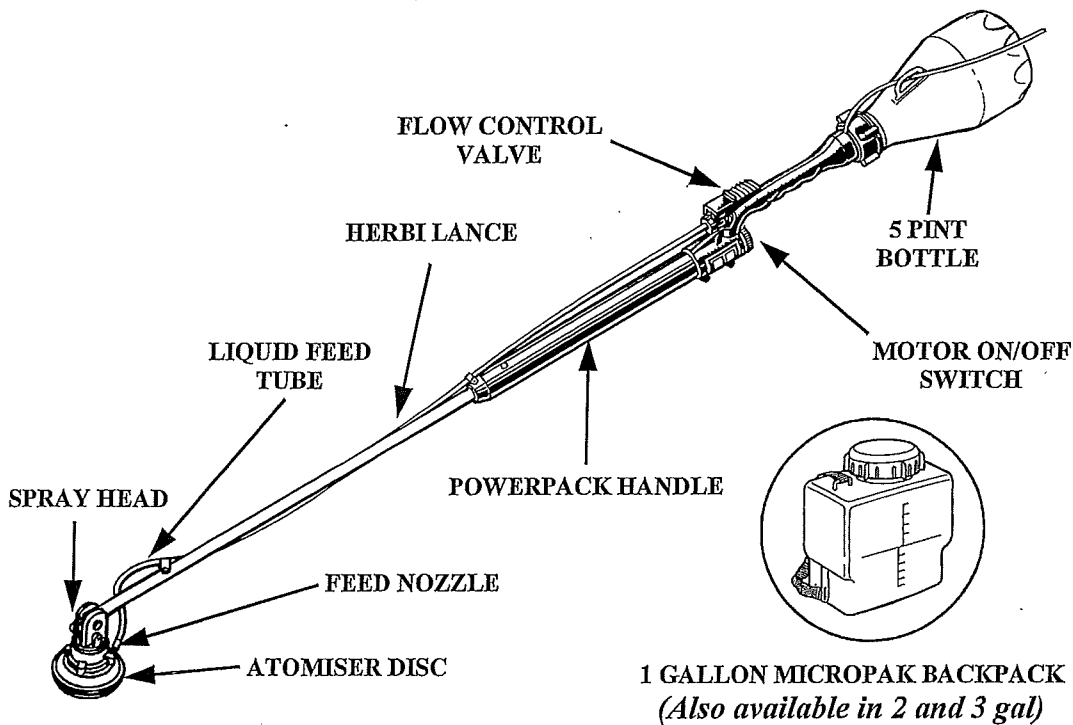
Microfit Herbi

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DESCRIPTION

The MICROFIT HERBI, part of the modular MICROFIT system, 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 4 foot wide band at low volumes (1 to 3 gallons per acre). A governed electric motor spins the atomiser disc at a constant 2,000 rpm to produce uniform spray droplets of around 250 micron which are large enough to minimise any risk of spray drift. Liquid is fed by gravity through color coded feed nozzles. The MICROFIT HERBI 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 5 pint bottle is 9 lb.

Specially designed Micron *Micropak* backpacks and a shoulder strap are available for use with the MICROFIT HERBI.



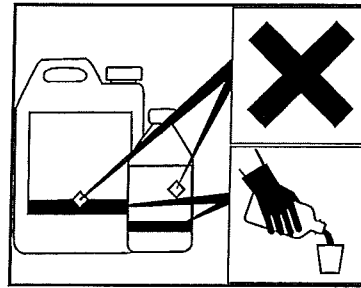
SAFETY

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 MICROFIT HERBI in potentially explosive atmospheres or spray flammable liquid through it.

The MICROFIT HERBI 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 product applied per hectare.

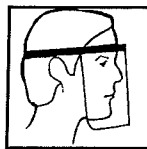
Never eat, drink, or smoke when working with agrochemicals. After using agrochemicals or handling equipment wash your hands thoroughly. Keep people (especially children) and animals out of areas being sprayed.

Always store agrochemicals safely to protect people and animals, and to safeguard the environment (take special care to avoid water pollution). See 'SPRAYING' section for guidelines on safe use of the MICROFIT HERBI 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 MICROFIT HERBI is:

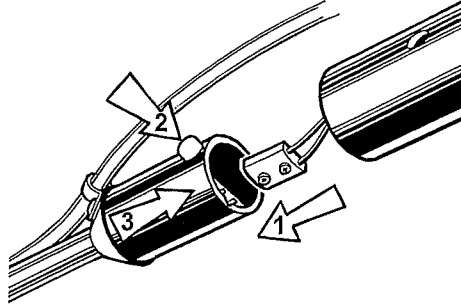
- ◆ rubber gloves
- ◆ boots/shoes and long trousers
- ◆ eye protection
- ◆ long sleeved shirt



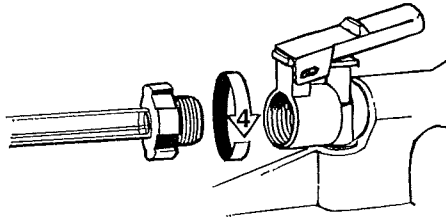
PREPARING FOR SPRAYING

The sprayer is supplied as a separate POWERPACK and HERBI spray lance and must be assembled prior to use.

Fit the HERBI spray lance to the POWERPACK by first pushing the electrical plug (1) on the POWERPACK into the socket, then depressing the white button (2) on the lance assembly and pushing the lance into the POWERPACK (3) until the button locates in the hole provided in the POWERPACK.

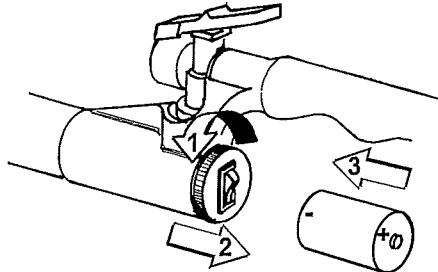


Screw the union nut (4) into the flow control valve.

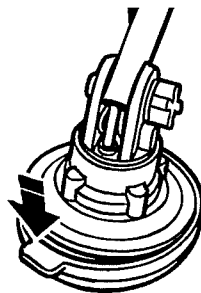


Insert four batteries (D cell/R20) into the POWERPACK, negative, i.e. flat end first:

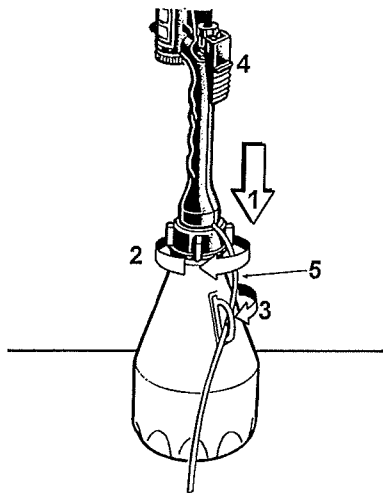
Press and rotate the switch holder anti-clockwise (1) and remove (2). Insert batteries (3). Refit the switch holder by pushing in and turning clockwise.



Remove the protective cover from the atomiser by pressing down on the tab as shown. Check by hand that the atomiser disc spins freely.



Two types of spray liquid reservoir are available for use with the MICROFIT system; a 5 pint spray bottle which comes as standard or 1, 2 and 3 gallon *Micropak* backpacks which make it possible to treat larger areas between refills.



Fitting the spray bottle

To fit the bottle to the POWERPACK, fill the bottle to the required level and place it on a level surface.

Fit the POWERPACK into the bottle (1) ensuring that the bottle handle (3) is in line with the flow control valve (4).

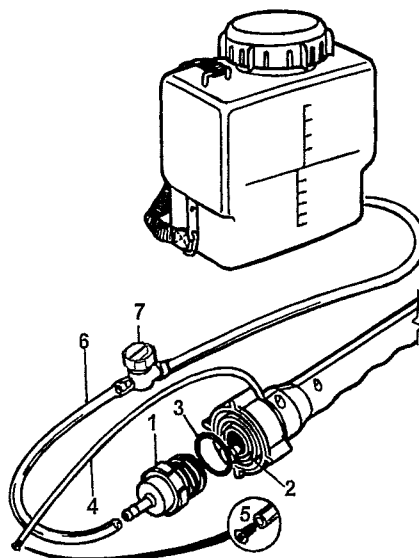
Tighten the bottle securing cap (2) and pass the air bleed tube (5) through the bottle handle (3). This is important to ensure that the air bleed system functions correctly.

Fitting a backpack

Instructions on assembling the Micron *Micropak* backpacks are contained in the tanks.

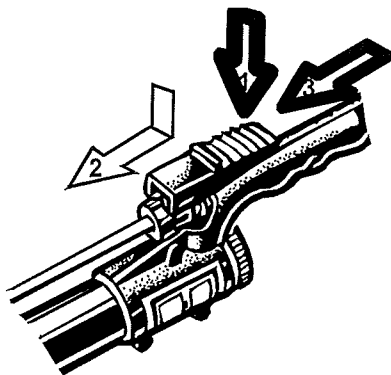
Screw the backpack connector (1) into the bottle holder (2) ensuring the 'O' ring (3) is in place. Seal the air vent tube (4) with the screw provided (5) to prevent liquid leaking from the tube. The screw **must** be removed from the air vent tube if using the 5 pint bottle.

Fit the tube (6) to the in-line siphon tap (7). Then fit the tube to the hose barb on the backpack connector (1).



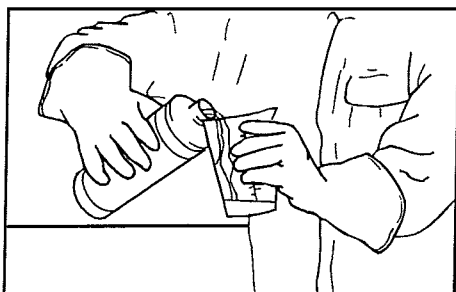
Flow control

To open the flow control valve press the lever (1) down for treating small areas. For continuous spraying press the lever down and forward into the locked position (2). To close the flow control valve and stop the liquid flowing, pull back the lever and release. N.B. For safety in transit, the valve can be locked in the off position by slightly raising the lever and then sliding it forward (3).

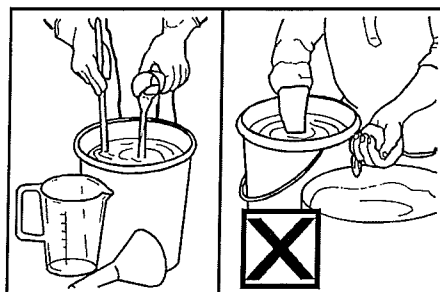


MIXING AND FILLING AND CALIBRATION

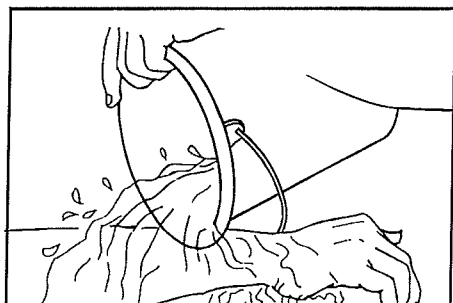
Mixing and filling is generally the most hazardous process in the spraying operation. **Always** follow the label instructions. **Always** use a filter (fitted in the Micron *Micropak* backpacks) and use a funnel if filling a container with a small neck. **Only** mix enough spray for the area to be treated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



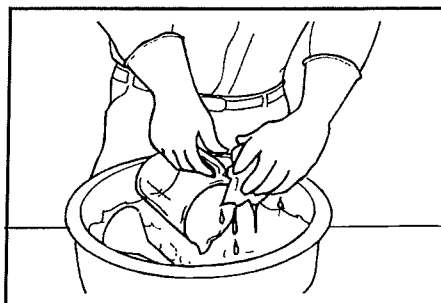
Always wear gloves when handling agrochemicals and equipment.



Always use the correct equipment when mixing and measuring.



Always wash off any skin contamination.



Always clean all equipment after use.

With the MICROFIT HERBI herbicides are usually applied in around 2 gallons total spray volume per acre, with the exception of glyphosate which can be applied at volumes as low as 1 gallon per acre. These are lower volumes than recommended for high volume application with knapsack sprayers. In general use the minimum dose rate recommended on the label for the intended treatment and add water to make up to the volume required for application with the MICROFIT HERBI.

For example, if the label recommends applying a minimum of 2 pints of product made up to 20 gallons of water per acre with a knapsack sprayer, use 2 pints of product made up to 2 gallons for application with the MICROFIT HERBI.

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 MICROFIT HERBI at concentrations greater than recommended on the label.

Micron will not generally recommend using spray mixes 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, select the dose rate of product to be applied per hectare (from the product label) and mix in a suitable container.

Examples of mixing spray - for 1 acre

a) Glyphosate (360 g/l): 1.6 pints
add water: 6.4 pints

Total volume: 8.0 pints

i.e. 1 part glyphosate : 4 parts water

e.g. 1 pint glyphosate + 4 pints water
in 5 pint bottle

b) 2,4-D (500 g/l): 2.4 pints
add water: 13.6 pints

Total volume: 16.0 pints

i.e. 3 parts 2,4-D : 17 parts water

e.g. 12 oz 2,4-D + 4 pints, 4 oz
water in 5 pint bottle

Never use leaking equipment. Take care to avoid spillage of the spray mix

Calibration

In order to ensure that the MICROFIT HERBI is applying the correct volume of spray liquid per unit area (*total spray volume*), it is important to calibrate the sprayer before use. The formula below gives the approximate relationship between *flow rate*, *total spray volume*, *walking speed* and *swath (or band) width*.

$$\text{Flow rate (oz/min)} = 0.02 \times \text{total spray volume (gal/acre)} \times \text{walking speed (mph)} \times \text{band width (inches)}$$

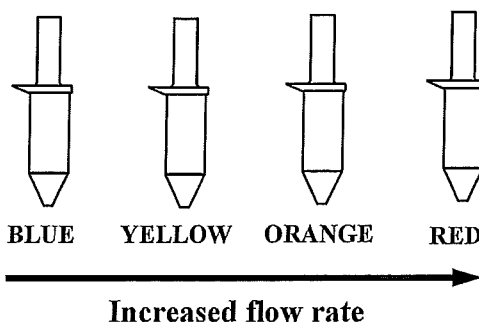
The *total spray volume* is the volume of spray mixture (chemical plus water) applied per unit area. Generally a total spray volume of 1 gallon per acre is used for Roundup (and other Glyphosate-based products) and 2 gallons per acre for other herbicides

As a general rule a normal average *walking speed* is around 2 miles per hour.

The *swath width* of the HERBI lance is fixed at 4 feet.

The *flow rate* is determined by the color of feed nozzle fitted.

Using the table below, select and fit the nozzle which will give the appropriate *flow rate* for the herbicide which you are using. It is not recommended to use flow rates in excess of 6 oz/min as this will cause flooding of the disc and adversely effect atomisation.

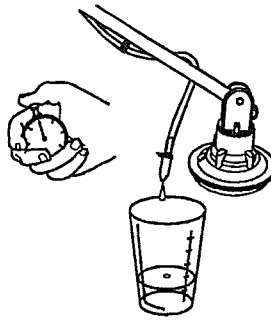


Total spray volume (gallon/acre)	Band width (feet)	Feed nozzle	Flow rate (oz/min)	Walking speed (mph)
1 (i.e. glyphosate)	4	Blue	2.5	2.5
2 (i.e. other herbicides)	4	Blue Yellow	2.5 5.0	2.5

NB. The flow rates in this table were measured using the 5 pint bottle filled with water and the sprayer held with the spray head 26 inches below the bottle outlet. Flow rates will depend on whether a bottle or backpack is used; the angle of the spray lance; and viscosity of the actual spray liquid.

If in doubt, therefore, the flow rate should be checked under the actual conditions of use. The actual flow rate can be checked holding the MICROFIT HERBI in the spraying position (see 'TO START SPRAYING').

Remove the feed nozzle from the spray head by twisting and pulling out, then allow the liquid to flow into a suitable container and once a steady flow is established measure the volume dispensed in one minute.



If the flow rate is not in the recommended flow rate range of 2 to 6 oz/min change the feed nozzle and repeat the above procedure. N.B. It is preferable to walk more slowly to achieve the required spray volume than to use higher flow rates.

Example:

Required spray volume rate = 2 gal/acre

Flow rate measured = 3.5 oz/min

$$\text{Walking speed (m/s)} = \frac{\text{Flow rate (oz/min)}}{0.02 \times 48 \times \text{total spray volume (gal/acre)}} = \frac{3.5}{0.96 \times 2} = 2.0 \text{ mph}$$

BEFORE SPRAYING

Check the wind speed and direction (below 2 mph 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.

Before spraying for the first time use water to check the spray pattern produced and familiarise yourself with the sprayer. Put some clean water in the bottle or backpack and add a small amount of detergent (2 to 3 drops). With the sprayer in the spraying position (see 'TO START SPRAYING'), check for leaks. Switch on the sprayer and then open the flow control valve. If using a *Micropak* backpack also open the in-line siphon tap. Again, check for leaks.

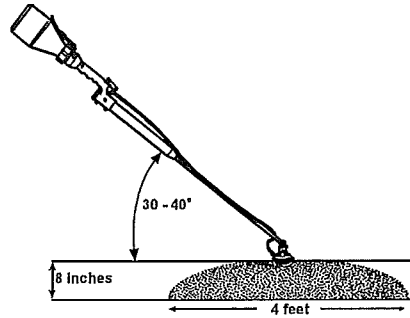
Spray on one spot, preferably on clean dry concrete, for around 30 seconds with the spray head held about 8 inches above the ground; a wet ring 4 feet wide should appear on the ground. Practice using the sprayer by walking along a few yards and then stopping spraying (see 'TO STOP SPRAYING').

TO START SPRAYING

The MICROFIT HERBI 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 MICROFIT HERBI 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 container.

Hold the spray head about 8 inches above the ground or weed foliage. Switch on the sprayer, check the atomiser disc starts spinning and then open the flow control valve (see 'PREPARING FOR SPRAYING - *Flow control*').

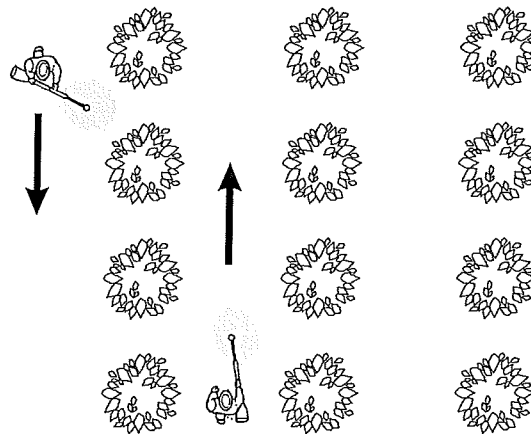
Start walking immediately the spray liquid reaches the feed nozzle. **Never** touch the atomiser disc when spinning or hold the spray head too close to the



Always keep the spray head at least 2 feet from any part of the body to avoid direct contamination by the spray.

It is best to hold the MICROFIT HERBI to the side so that the operator does not have to walk over the treated area.

The MICROFIT HERBI will treat a strip of around a mile and a quarter in about 35 minutes using a single 5 pint bottle (applying at 1 gallon per acre).



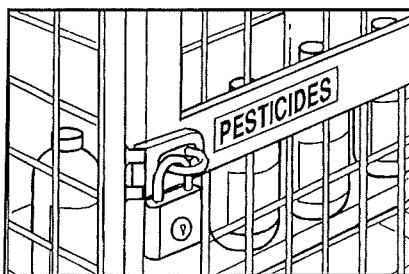
TO STOP SPRAYING

Close the flow control valve and then switch off the sprayer. When the atomiser disc has stopped spinning raise the sprayer to an angle of 45°. **Never** raise the spray head until the atomiser disc has stopped spinning. Then open the flow control valve and drain any remaining liquid in the feed tube back into the bottle. If using a backpack raise the feed tube above the level of liquid in the tank until all the liquid has drained from the tube. Then close the flow control valve and, if using a backpack, the in-line siphon tap (this isolates the liquid in the backpack and means it can be disconnected from the sprayer).

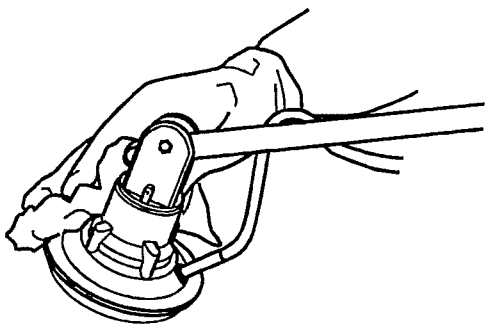
AFTER SPRAYING

1. Dispose of any surplus spray mix according to the product approval.

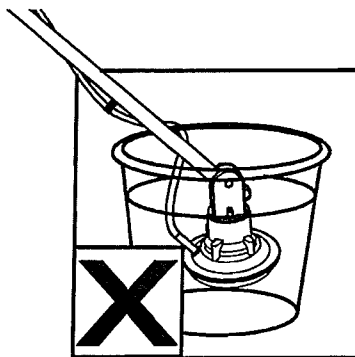
Store products safely, locked up and out of the reach of children.



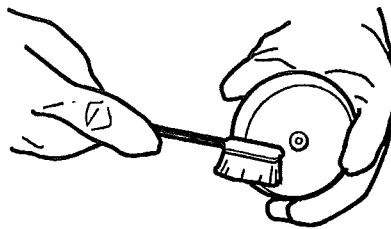
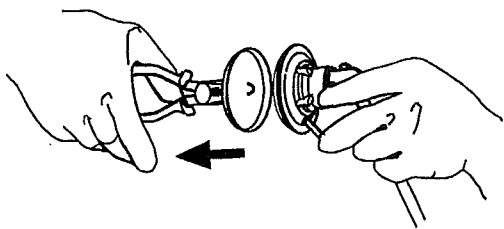
2. It is **essential** to clean the sprayer and bottle or backpack thoroughly using water and detergent after use. A water and detergent mix should be put in the bottle, swilled around, and then sprayed out onto the treated area or an area of waste ground.



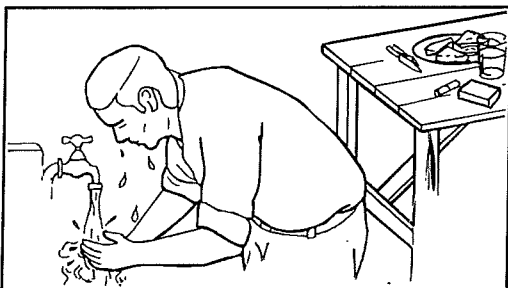
The sprayer and bottle should be wiped down externally using a cloth.



Never immerse the spray head in water or under a tap, since this will destroy the electric motor.



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



3. After working with agrochemicals, or handling spraying equipment, **always** thoroughly wash hands and exposed skin.

All protective clothing should be washed and stored separately from other clothing. Contaminated gloves should be washed inside and out.

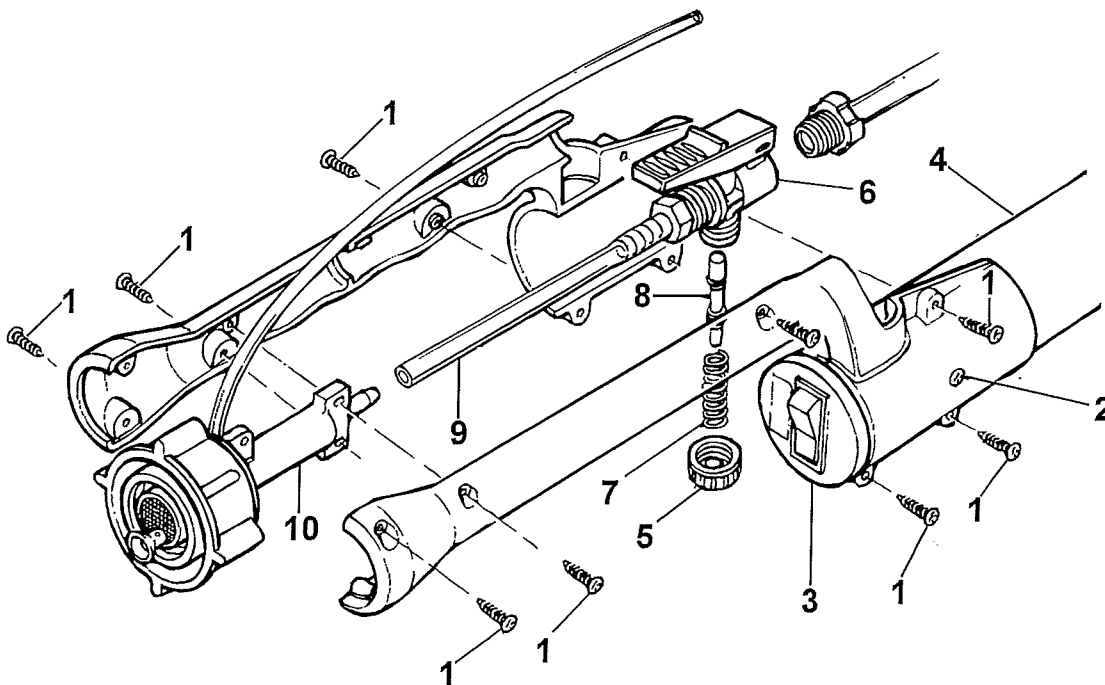
STORAGE

Before storing the MICROFIT HERBI for long periods disassemble the sprayer. Remove the bottle or backpack and unscrew the union nut from the flow control valve. Then depress the white button on the POWERPACK assembly and remove the HERBI spray lance. Remove the batteries from the POWERPACK to avoid corrosion. Check electrical contacts are clean and dry. Store in a dry place away from direct sunlight. Batteries should be stored in a dry cool place.

FLOW CONTROL VALVE MAINTENANCE

Disconnect the HERBI spray lance from the POWERPACK and remove the 5 pint bottle.

Remove the 9 screws (1) that hold the two halves of the POWERPACK handle together - **do not** remove the small screw (2) that secures the handle (3) to the battery case (4). Separate the handle to gain access. Unscrew the serrated cap (5) at the base of the flow control valve (6) and then remove the spring (7) and plunger (8). Then disconnect the flow control valve (6) and feed tube (9) from the bottle holder (10). Clean all components in warm soapy water and re-assemble in reverse order.



Safety Notes:

a) Acoustic information: the sound pressure level at the operator's ear does not exceed 70 dB(A).

b) Vibration: the weighted RMS acceleration value at the hands when using this machine does not exceed 2.5 m/sec².

TROUBLESHOOTING

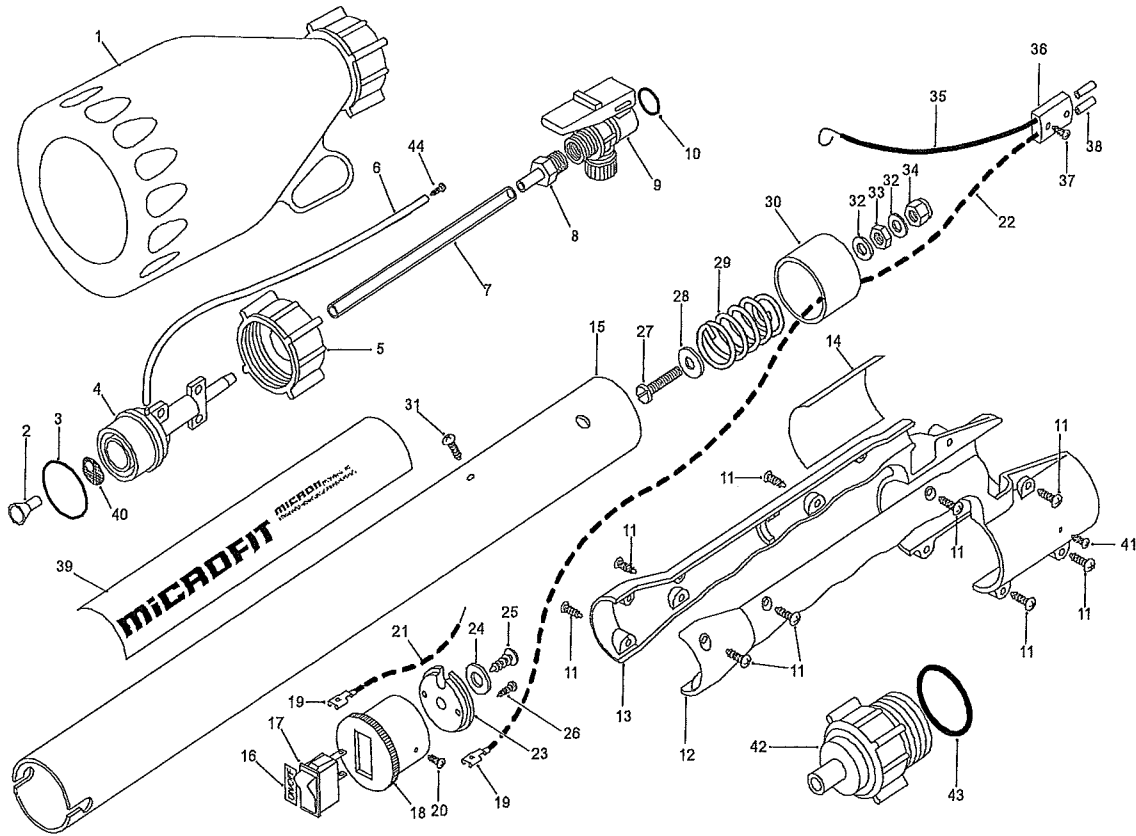
Atomiser disc spins but does not spray or sprays irregularly. Check:

- the feed nozzle for blockage. If the feed nozzle is blocked remove and soak in soapy water. (**Never** blow through the nozzle with your mouth).
- that the feed nozzle gives a flow rate within the operating range.
- the air vent tube for blockage if using the 5 pint bottle. Clean if necessary.
- the filter gauze in the POWERPACK handle. Clean if necessary.
- the atomiser disc is clean and undamaged. Clean or replace.
- the flow control valve for blockage (see 'FLOW CONTROL VALVE MAINTENANCE').
- the in-line siphon tap for blockage if using a backpack. Clean if necessary.

Atomiser disc fails to spin or spins unevenly. Check:

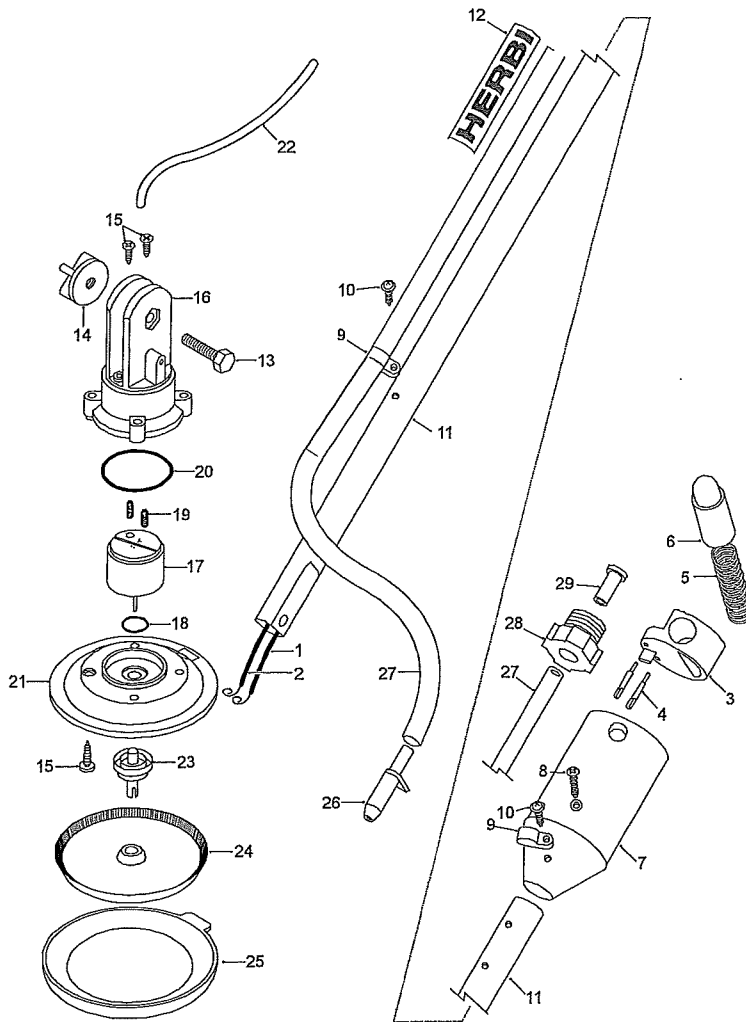
- that the batteries are fitted correctly.
- the condition of the batteries. Replace if necessary.
- that electrical terminals and contact points are clean and that electrical wires are not broken or corroded.
- the motor for corrosion or obvious signs of wear. Replace if necessary.
- the plug is in the socket.

POWERPACK PARTS LIST/DIAGRAM



ITEM	PART NO.	DESCRIPTION	QTY.	ITEM	PART NO.	DESCRIPTION	QTY.
1	4390	BOTTLE, 2½ LITRE + CAP	1	26	4939	SCREW, NO. 4 X 1/2" S/T (AB)	2
2	5063	AIR BLEED DEFLECTOR	1	27	4318	SCREW, 2.BA X 1" PANHEAD	1
3	5148	'O' RING	1	28	3168	WASHER, 1/4", FLAT	1
4	4904	BOTTLE HOLDER + FILTER (5037)	1	29	3070	BATTERY SPRING	1
5	4940A	BOTTLE SECURING CAP + 'O' RING (5148)	1	30	4315	CENTRE CONNECTOR	1
6	3374/40	TUBE 3/16 O.D., NYLON - 0.40M	1	31	3456	SCREW, NO. 6 X 1/4", S/T (B)	2
7	4309/14	TUBE, 5MM I.D. X 8MM O.D. PVC - 0.14M	1	32	4877	WASHER, 2 BA FLAT	2
8	4912A	CONNECTOR HOSE, 12 MM	1	33	3673	NUT, 2 BA	1
9	4917	VALVE C/W 'O' RING	1	34	4420	NUT, 2 BA, NYLOC	1
10	5057	'O' RING	1	35	4134/20	WIRE, 1.00 MM2, BLACK - 0.20M	1
11	4806	SCREW, NO. 6 X 5/8", PLASTITE	9	36	5095A	PLUG ELECTRICAL, RADIUS/FLAT	1
12	4899L	HANDLE, LEFT HAND	1	37	5109	SCREW, 3 X 6 MM, PT	2
13	4899R	HANDLE, RIGHT HAND	1	38	5104	CONNECTOR SOCKET	2
14	4957	LABEL, BATTERY	1	39	5130	LABEL, MICROFIT	1
15	5108	BATTERY CASE, 0.445M	1	40	5037	FILTER	1
16	4958	LABEL, ON/OFF	1	41	5170	SCREW, NO. 4 X 3/16" S/T (B)	1
17	4918	SWITCH	1	<i>BACKPACK CONNECTOR KIT - Part No. 5087A, comprising of:</i>			
18	4906A	SWITCH END PIECE + SCREWS	1	42	5087	BACKPACK CONNECTOR,	
19	5050	TAG, 1/4" FLAG	2	43	5111	'O' RING	1
20	4758	SCREW NO. 4 X 5/16", S/T (AB)	2	44	4622	SCREW, NO. 6 X 1/4" S/T (B)	1
21	4368/8	WIRE, 1.00 MM2, RED - 0.08M	1	<i>OPTIONAL EXTRAS (not shown):</i>			
22	4368/62	WIRE, 1.00 MM2, RED - 0.62M	1	5404B	MICROPAK BACKPACK, 5 LITRE COMPLETE		
23	4905	SWITCH COVER	1	5207B	MICROPAK BACKPACK, 10 LITRE COMPLETE		
24	4954	WASHER, 1/4 X 1/2" BRASS	1	5505B	MICROPAK BACKPACK, 15 LITRE COMPLETE		
25	4802	SCREW, NO. 14 X 1/2" S/T (AB)	1	5107A	STRAP, SHOULDER COMPLETE		

HERBI LANCE PARTS LIST / DIAGRAM



ITEM	PART NO.	DESCRIPTION	QTY.	ITEM	PART NO.	DESCRIPTION	QTY.
1	3205/81	ELECTRIC WIRE, BLACK - 0.79M	1	17	5442	MOTOR	1
2	3280/82.5	ELECTRIC WIRE, RED - 0.79M	1	18	5454	'O' RING (BS 611)	1
3	5085	SOCKET	1	19	4457	SPRING, 9/32" TERMINAL CONNECTING	2
4	5103	PIN CONNECTOR	2	20	5455	'O' RING (BS 365-30)	1
5	5101	SPRING, PUSH BUTTON	1	21	5424	FRONT PLATE	1
6	5086	PUSH BUTTON	1	22	3512/20	AIR VENT TUBE - 0.20M	1
7	4898	TUBE / HANDLE CONNECTOR	1	23	5022	SLINGER / DUMMY SHAFT	1
8	4647	SCREW, NO. 6 X 1/4" S/T	1	24	5021	ATOMISER DISC	1
9	4747	TUBE CLIP	2	25	4462	ATOMISER PROTECTIVE COVER	1
10	3472	SCREW, NO. 6 X 1/4", S/T, AB	2	26	5038	FEED NOZZLE, BLUE	1
11	5100	TUBE, ALUMINIUM, 20 SWG - 0.715M	1		5039	FEED NOZZLE, YELLOW	1
12	5133	LABEL, HERBI	1		5040	FEED NOZZLE, ORANGE	1
13	5029	SCREW, M5 X 25MM HEX	1		5041	FEED NOZZLE, RED	1
14	4907	NUT, WING	1	27	4309/117	TUBE, PVC, 5MM ID X 8MM OD - 1.17M	1
15	5399	SCREW, M5 X 3/8", S/T, POZI PANHEAD	6	28	5102	NUT, UNION	1
16	6125A	MOTOR HOUSING (C/W AIR VENT TUBE)	1	29	5088	VALVE / HOSE CONNECTOR	1

NOTES