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**Practical training notes for obtaining a Pest
Control Operators Certificate**

**Based on using the Cooper Pegler CP15 Evolution 15L
Knapsack sprayer**



Setting up a new Agrichemical Knapsack Sprayer

Always first read the instructions that come with the spray equipment in particular regarding the pressures and nozzles to use for Herbicide use.

Attaching straps

Use the slots provided and the method indicated to attach the straps



Setting the pressure regulator



Set the pressure by selecting L or H on the selector inside the spray tank

Selecting correct nozzles for spraying herbicides

Always insert and only operate with the nozzle filter in place. For our application the nozzle that I mostly use is the yellow flat fan nozzle. Supervisors are to make regular checks to see that that the filters are clean and are in place and that the nozzles are clean and are spraying correctly.



Low drift flat fan nozzles



These nozzles are designed to reduce the drift with good coverage at the low pressure setting. These nozzles are especially recommended for systemic post-emergence treatments.

Excellent for pre and post emergence pesticide applications. Suitable for use with knapsacks over a 1 -4 bar (15 - 60 psi) pressure range

The 02 F110 Yellow Flat Fan Nozzle sprays a width of 1.0 meter at 50 cm from the target area

Deflector nozzles

These nozzles are wide angle nozzles for herbicide application, they are mostly used for pre-emergence herbicide spraying when a larger droplet size is required.



Important note:



Operator adjustable nozzles supplied with some knapsack sprayers are not to be used under any circumstances for the spraying of herbicides because the angle of spray and the application rate can easily be adjusted by operators who do not have the knowledge or experience to set them up correctly.

1. Using the incorrect nozzles wastes considerable amounts of tank mix
2. This bad practice requires the use of far more herbicide concentrate
3. This bad practice requires the use of far more water
4. This bad practice greatly reduces the area sprayed per day combined with
5. The additional cost of herbicide the extra need to supply water and the reduced area sprayed dramatically increases the cost of spraying

Care of spray equipment

1. Keep the sprayer clean at all times in particular on the inside to prevent clogging of the filters and nozzle which disturbs the spray pattern and usually ends in the nozzle blocking completely, this wastes both the time to clean out the equipment and requires that the herbicide in the tank be discarded.
2. Never treat the sprayers roughly such as simply throwing spray equipment onto or off of the back of a truck or van. Never allow staff to sit on knapsack sprayers they are not seats.
3. Take care to prevent damage to the spray lance and nozzle.
4. At no time allow the nozzle to be stuck into the ground.

THE SUPERVISOR MUST CHECK DAILY

1. That only use spray equipment that is in good working order is being used.
2. The nozzles for damage, cleanliness and correct spray pattern before use and during the day.
3. To see that the spray trigger is cutting off the supply of mixed herbicide completely when it is released.
4. Check for leaks when under pressure check that the cap is sealing so that the tank mix cannot pour out onto the back of the operator
5. That operators do not leave sprayers under pressure when transporting from site to site or overnight.
8. That operators do not leave sprayers with mix in the tank overnight.
9. That there is always a bucket on site with plenty of clean water in it for washing hands when handling Herbicide concentrates and spray equipment.
10. That spray operators always have soap and cloths or towels on site.
11. That spray operators always keep the chemical and water containers clean in particular blue dye containers, always wash dye concentrate that spills onto the container or onto hands or gloves off immediately.
12. That spray operators always wash out the sprayer at the end of the day with fresh water and pump clean water through the sprayer to purge it of all chemical residues
13. That spray operators always wash out nozzles and filters after use, to prevent clogging of the filter and nozzle this is of particular importance when using blue marker dye.
14. That at the end of the day that the nozzles and filters are removed, checked for damage and are placed into a plastic jar filled with soapy water



THERE IS ABSOLUTELY NO ACCEPTABLE EXCUSE FOR CONTAMINATING HERBICIDE CONCENTRATE CONTAINERS, WATER CONTAINERS, SPRAYERS OR VEHICLES WITH HERBICIDES OR BLUE DYE

Personal protective equipment

1. Spray operators are to only apply herbicides if they are wearing full PPE required for use by spray operators.
2. Dust masks are not to be used for spraying. Use only spray respirators fitted with the correct cartridge for the spraying of the herbicides to be sprayed
3. Spray overalls should be removed and washed after each day's spraying.
4. Eye protection and gloves must be washed before use each day.
5. Never put on contaminated gloves, eye protection or respirators.
6. Boots are always to be kept clean and in good condition

Mixing of Herbicides

1. Always read the label before use and apply in strict accordance with the legal provisions printed on the label. Applying more herbicide than what is needed to achieve good results can do unwanted damage to the environment. **Note: Always use the recommended Herbicide and application rate or less for the species being sprayed, there are different herbicides and application rates for different species.**
2. Always apply the correct amount of herbicide adjusted in regards to the species being sprayed, the weather conditions and the growth of the target plants. The more favorable the growing conditions the more that the herbicide to be applied can be reduced.
3. Always use a clean well calibrated measuring jug that gives accurate measurements in particular when small amounts of herbicide are being added to the tank mix. A small error that adds more herbicide than required to the tank mix per tank can result in a huge amount of wasted herbicide at the end of a month when a large team is at work. This both subjects the natural environment to more herbicide contamination and costs the contractor more money.
4. Avoid contamination of skin or clothing with Herbicide concentrate. If contamination accidentally occurs, wash immediately with soap and water before continuing.
5. The larger the amount of herbicide that can be mixed at a time the more accurately it can be mixed reducing wastage of herbicide as well as saving considerable time that goes into mixing individual tank mixes.
6. Ensure that no herbicide concentrate is spilled onto the ground.
7. Dish washing liquid in particular Sunlight liquid is an excellent wetter, sticker and penetration promoter. It also keeps the spray equipment clean.
8. Never spray up into the air at a height of over one meter in windy conditions due to excessive spray drift.
9. Do not under any circumstances allow spray drift to contaminate areas not to be sprayed.
10. **WARNING NEVER** mix herbicides in particular broad leaf herbicides under or near to trees because spills will probably result in damage to or the death of the tree.
11. when mixing directly into the spray tank, always partially fill the tank with water before adding the chemicals then top up to the desired level once the agrichemicals have been added.



12. Always use clean water of a PH of 7 free of contamination for making the tank mix.
13. Always keep water containers closed so that contamination cannot enter them.
14. Do not allow contamination to enter the spray tank.
15. Always use a clean measuring jug for measuring agrochemicals to avoid contamination from entering the spray tank
16. Always wash the measuring jug after use.
17. Always check that the measuring jug is free from contamination before each and every use, failure to do so allows dirt to enter the spray tank which causes blocked nozzles that affect the spray pattern giving poor coverage and reduces spray speed and above all wastes time and tank mix.
18. Always keep herbicide containers, sticker containers and blue dye containers clean especially around the filler and cap to prevent contamination of the tank mix and to prevent contamination of the person mixing the agro-chemicals.

Spraying of Herbicides

1. Only use staff that have been correctly trained and that have been clearly instructed as what is to be sprayed for the day.
2. Constantly monitor performance of the spray operators under your control for bad spray habits and correct immediately.
3. Calibration of the equipment and the correct spray pressure and nozzles that are to be used for the job is important.
4. The walking speed and coverage to near runoff must be constant
5. The height that the spray nozzle is being held above the plants must be correct and constant. If held too high in the air the amount of spray drift increases considerably under windy conditions.
6. Do not spray if the plants are wet in the early morning or after rain as it greatly lessens the effectiveness of the spray.
7. Do not spray if it is likely to rain soon after spraying.
8. Check on the herbicide label for details for each and every herbicide combination used.

Wind Speed and Direction

1. Always measure wind speed and direction before spraying. The wind speed to be determined by the use of a handheld wind speed meter.
2. Always follow the information on the label, in general spray only at low wind velocities of less than 15km/h, wind speeds of 3.2-6.5 km/h are preferable.
3. If wind speed or direction changes during an application, immediately reassess whether it is advisable to continue.
4. Never spray under strong windy conditions of over 25 km/h.
5. The operator **MUST ALWAYS ONLY** spray with the wind on his or her back. **NEVER EVER** allow a spray operator to spray directly into the wind in particular on a windy day.
6. Wind speed and direction should be documented hourly.

Precautions

1. Ensure at all times that the spray operator or bystanders do not get to breath in spray drift in particular herbicides.



2. Beware take special caution if Herbicides containing Picloram are to be used, because is very harmful to the environment as well as to the eyes. Do not allow spray to enter the eyes and if it does always have plenty of fresh water in a bucket on the spray site with soap, clean water and a towel to wash the eyes well.
3. Always have a first aid box with appropriate eye wash onsite

When to spray

It is usually best to spray very early in the morning before the wind gets up

When not to spray

Do not spray when it is expected to rain shortly after the last application (check the label for instructions).

Do not spray under very windy conditions

Do not spray when the wind blows spray drift towards susceptible vegetation

Used chemical containers

Do not leave used herbicide containers lying about they must be always kept under strict supervision. Remove them the same day from site and dispose of them as per the herbicide label
Never let the staff or anyone else use used herbicide containers for the storing of drinking water or for use at home.

Used chemical containers must only be disposed of at a site registered for this purpose and the proof of disposal must be kept on record.

Compiled by Michael Hickman for HLEM on 25.11.17 revised on the 11.02.22

Ecosystems Manager, specializing in, weed control as well as alien plant removal and rehabilitation of natural environments.

