



Information Sheet

10.4 Spraying herbicides with low volume, controlled droplet application (CDA) systems

Controlled droplet application (CDA) is a technique that makes use of centrifugal forces to generate spray droplets of the optimum size range for the control of a target pest. Liquid droplet size exerted by the CDA technique is more controlled and uniform as compared to conventional hydraulic nozzles. The average droplet size is 250 microns (one micron = 1/1000 mm in diameter). Droplets delivered from hydraulic systems can vary from one to 1000 microns in size. The principle behind the CDA technique is to improve droplet size and reduce spray volumes while maintaining spray coverage. The absorption of spray droplets and coverage of target is improved through CDA technology.

CDA systems are less prone to drift as droplets are still more likely to reach the target if spraying is carried out in relatively calm conditions. Very small droplets, particularly at high pressure, are more susceptible to evaporation and drift, as they can remain in suspension for long periods. Large droplets are prone to splashing and can bounce off the target, which may result in less product uptake by the plant.

The most used CDA models are battery-driven. The CDA system can be hand-held as it is light and easy to handle on steep terrain. A vehicle-mounted CDA system is also available and is being used in the industry on four-wheel motorcycles also known as an all-terrain vehicle (ATVs). The vehicle-mounted CDA system has the advantage of being able to cover very large areas rapidly, due to wide spray swaths and the savings in refill time.

Notes: - Consult the herbicide label to verify that the product is registered for use with the CDA system and ensure that the type of sprayer used, and the parameters use optimises the efficacy of the herbicide applied.



▲ Figure 1: Hand-held gravity fed CDA system.

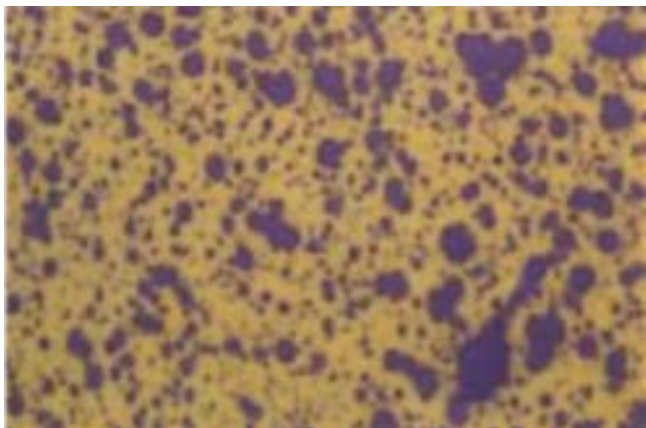
Source: <https://www.agrimek.co.za/index.php/our-brands/micron/herbi-4>
and https://www.microngroup.com/shop/images/img_8581_orig.jpg



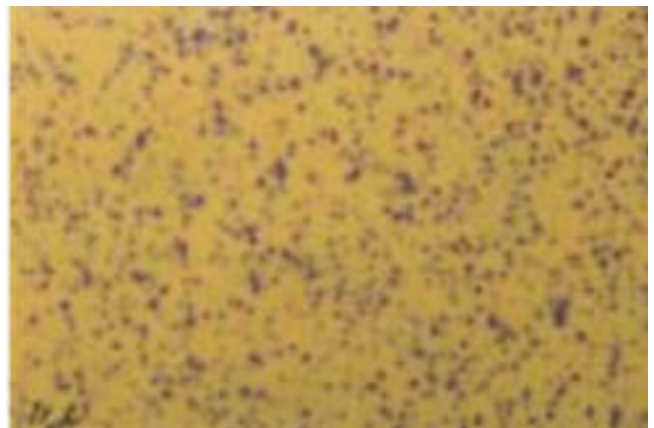
▲ Figure 2: ATV mounted CDA system with 8 nozzles.

Source: <https://www.hastingshonda.co.nz/accessories/c-dax-spray-boom-4m/>

Lurmark AN 4.0 nozzle



CDA applicator red nozzle



▲ Figure 3: Differences in droplet size and distribution between a flood jet nozzle and CDA.

Advantages of CDA system:

1. CDA equipment is light and easier to handle and thus makes it ideal for steep terrain.
2. The process is less strenuous on operator as compared to the conventional spraying process as no pumping is required.
3. CDA allows for high work rates and increases productivity.
4. One operator can treat about two hectares per day, which is approximately double the area normally covered by knapsack operators, therefore reducing labour costs.
5. Vehicle-mounted CDA can also cover a larger area per day compared with conventional tractor mounted hydraulic systems.
6. The CDA system is usually designed to deliver the product in water volumes ranging from 20 to 50 litres per hectare.
7. A conventional pressure system can easily be converted to CDA as any tank can be used. Growers then have the option to convert back to the original system if necessary.
8. CDA systems reduce environmental contamination while ensuring the optimisation of herbicides.

Disadvantages of CDA system: _____

1. Batteries are needed to be changed (or recharged) periodically. It is reported that a CDA system can normally run for ±40 hours on a set of four torch batteries.
2. Theft could be a problem.
3. A blockage that may result in spray error may go unnoticed, due to the low volume of liquid being applied.
4. Being gravity fed, the system is restricted to a specific operating height and cannot be used to treat tall weeds.
5. CDA droplets do not have the velocity and momentum of those sprayed with pressure systems and therefore have less penetration. In addition, CDA causes less physical disturbance, which suggests that small weeds may be sheltered from the spray by larger plants.
6. Due to the high concentration of product in the spray mixture, highly toxic products such as paraquat should not be applied with this system. Consult the herbicide label to verify that the product is registered for use with the CDA system.
7. Labourers using CDA equipment need to be conscientious and skilled for the system to be successful.

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