Advantages Of A Covered Sprayer For The Grape Farmer

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Chemical weed control currently constitutes an important part of most vineyard cultivation programmes. Most producers control winter weeds and/or cover crops just before budding.

This application entails a mixture of post-emergence and pre-emergence herbicide. The latter is included in the mixture to prevent germination of spring and summer growing weeds. Unfortunately no single registered pre-emergence herbicide will control all the weeds that occur in vineyards. The post-emergence herbicides that do not require directed spraying in the vineyard after budding, control mainly or only grasses. These herbicides are usually more expensive than the post-emergence herbicides that require directed spraying after budding. Due to the above limitations, it is often necessary to control resistant weeds (the perennial problem weeds in particular) with directed sprays of the more aggresive post-emergence herbicides in the course of the vineyard's growing season. As a result of persistent rain and wet soil conditions in the period before and during early budding, the spray that usually takes place before bud swelling, will often be completed after budding only.

When a directed application of a non-specific, systemic post-emergence herbicide is given in the vineyard's growing season, there is a risk that some of the spraying mist (caused by wind) could land on the green parts of the vines, resulting in damage. The changeability of the weather means that ideal conditions for the application of these substances in the growing season with a conventional sprayer are extremely limited. A need therefore exists for covered sprayers which will allow safe weed control in vineyards in the growing season, even under windy conditions.

To address the above problem, a locally produced covered sprayer (Fig. 1) was evaluated and compared with a conventional sprayer as regards safe and effective weed control in the growing season.

MATERIAL AND METHODS

Safety evaluation

Evaluations were conducted in Robertson and Stellenbosch in December 2000 and January 2001 respectively. A contact spray was applied with a conventional sprayer at a dose of 3,5 /ha and an application volume of 250 /ha in vineyards trellised with a five cordon extended Perold system and a cordon height of 700 mm. The conventional sprayer's spraying beam was mounted at a height of 500 mm. In the case of the covered sprayer, the application volume was 100 /ha and the spraying beam was mounted so that the flaps at the bottom of the screen just touched the soil surface (Fig. 1). At the time of application of the herbicide, the wind speed at foliage height was measured with an Anemo wind speed gauge. In the case of Stellenbosch, the wind speed ranged between 15-20 km/hour and in the case of Robertson, between 25-32 km/hour. The vineyard was evaluated visually for the occurrence of herbicide damage two weeks after application.

Effectiveness evaluation

The effectiveness of the covered sprayer was determined on summer growing weeds (Fig. 2) in a vineyard in Stellenbosch in December 2000. The control of wheat cover crops (Fig. 3) was determined in Robertson in September 2001. In both instances a systemic substance (360 g glyphosate/litre) was applied at a dosage of 2,5 /ha. The application volumes for the conventional and covered spray were the same as in the case of the safety evaluation. Weed control obtained by the two application techniques was evaluated visually three weeks after application.

RESULTS AND DISCUSSION

Safety evaluation

In the case of both Stellenbosch (Fig. 4) and Robertson (Fig. 5) necrotic stains were found on a large number of leaves on the premises where the conventional sprayer was used. This indicates that a considerable amount of spray mist landed on the foliage. In the case of a systemic herbicide this degree of wetting would have resulted in a considerable uptake of the herbicide in the vine's system, with serious losses vis – vis vegetative growth and grape production. It is therefore extremely risky to apply a systemic herbicide with a conventional sprayer in the growing season, especially if the wind speed exceeds 10 km/hour and the vines are not screened off in some or other way. On the other hand, no herbicide damage was noticeable in the Stellenbosch vineyard where the herbicide was applied with the covered sprayer, even though the shoots were hanging fairly close to the ground (Fig. 6). Even in the case of the Robertson application, where the wind reached speeds of up to 32 km per hour, there was no noticeable damage to the foliage. The covered sprayer therefore offers producers the opportunity to continue spraying for longer periods than in the case of the conventional sprayer. It also facilitates the timeous control of problem weeds in the growing season (wind is an extremely limiting factor with regard to weed control).

Effectiveness evaluation

Although the cover crop stood very high during budding and the blades could easily have interfered with the spraying pattern of the spray heads, the covered spray effectively controlled the cover crops (Fig. 7). The covered spray also

controlled the summer growing weeds effectively (Fig. 8). In both cases the control was similar to that obtained with the conventional sprayer.

SUMMARY

- **The use of a covered sprayer for weed control in vineyards therefore has numerous advantages:**
- **Safe application, even under windy conditions, is possible during the growing season of the vineyard.**
- **The control obtained is just as good as with a conventional tractor sprayer.**
- **It facilitates the timeous control of problem weeds.**