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MECHANICAL HARVESTING OF WINE GRAPES

1. ORIGIN OF MECHANICAL HARVESTING

Before any form of mechanisation had been developed, vineyard practices were performed by hand and with horse-drawn equipment. The introduction of the first iron-wheel tractors meant grapevines had to be planted further apart in order for the tractors to fit between the rows. In time, these tractors were replaced by tractors with rubber wheels. Later on, chain-wheel tractors were used to assist with soil preparation. Besides the use of tractors, helicopters have more recently been used to spray herbicides and fungicides.

1.1 International development of mechanical harvesting

- Mechanisation originated in the Central Valley of California in the 1960s, which led to the harvesting of grapes in a more cost-effective manner for "vins ordinaires" (common, inexpensive table wines). In time, grapes were also harvested mechanically for more expensive wines.
- The 1970s saw mechanical harvesting take off in Europe, primarily due to the scarcity of manual labour. Since then, several new generations of harvesters have been developed.
- Interestingly, only 23% of farmers in California plan their vineyards so that they can mechanise. In the Coastal region of California, about 80% of the producers use mechanical harvesting, compared to almost all the producers in the Central Valley of California who make use of mechanical harvesting. In Washington, about 60% of the producers use mechanical harvesting, whereas only 8% of producers use mechanical harvesting in Oregon.
- Mechanisation started in Australia after the Second World War (the period of time from 1945 to 1970) with the arrival of tractors. Horse-drawn equipment was initially adapted to be used by these tractors. Later, special implements and equipment were developed specifically for tractors. More than 85% of Australia's wine grapes are currently harvested by machine.

1.2 Local developments in mechanical harvesting

Mechanical harvesting was introduced to South Africa in 1975 at a farmer's day that had been organised by the Oenological and Viticultural Research Institute at Nietvoorbij (now ARC Infruitec-Nietvoorbij) in Stellenbosch. The event was attended by 700 farmers and was organised to present the producers with the opportunity to see the harvesters and evaluate them for themselves. The harvesters that were demonstrated included the French Vector (Fig. 1), the American Chisholm Ryder and the Italian Mecca.



Figure 1: The French Vectur that was introduced to South Africa at the farmers' day held at Nietvoorbij in 1975.
(Photos: Hennie van der Westhuizen)

1.3 Cost considerations of mechanical harvesting

The cost of mechanical harvesting is estimated to be two to five times (2009) less than harvesting by hand. These costs will be discussed in more detail in fact sheet number ten.

The success of mechanical harvesting is largely dependent on the efficiency and maintenance of the machine as well as the training of the operator. In addition to the initial training of the operator, more experience gained will contribute to more successful mechanical harvesting.

The increased cost of manual labour and the increasing competition from countries with available labour has forced producers to become dependent on the mechanisation of their vineyard practices to remain competitive in the market. Certain mechanisation equipment was already available in the 1960s. However, because of the number of different grape varieties, training systems, availability of labour and combinations thereof, the progress of mechanisation was hampered. Furthermore, a large part of the successful utilisation of mechanical equipment in the future will depend on effective training of the operators. Mechanisation requires large initial capital inputs, as well as an effective farm management system.

Producers with premium varieties tend to prefer manual labour, provided that it can be at a reasonable cost. Increasing cost pressure, both nationally and internationally, most likely will advance the application of mechanised vineyard practices. The challenge is that it does not affect wine quality adversely.