MACHINE GRAFTING FOR GRAPEVINES

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This report relates the use of machines in grafting grapevines in a small California vineyard in Santa Clara County. It is a general non-scientific view of why this particular vineyard adopted machine grafting and how these machines were used and modified.

Before the use of machines, vines were budded in the field. A good budder, working with two assistants, would bud from 300 to 400 vines in an 8-hour day. There were other disadvantages besides this relatively slow rate. To find mature budwood before the rootstocks run out of water and cease growing is difficult in non-irrigated vineyards. This relatively short period, when field budding is possible, occurs in late August and early September, at the beginning of the vintage, the busiest season of the year. If the bud-graft does not take, that portion of the vineyard is idle for another year

In the winter of 1951-1952, the Novitiate purchased a grafting machine from Mr. Leon Brendel of St. Helena, California. This machine makes identical long triangular cuts in the rootstock and scion. The pointed cut scion is inserted into the V-notched rootstock and held in place by various methods At the time of purchase, we had thought that a man could make 1,000 grafts a day with this machine. The normal rate for three men still was from 400 to 500 grafts for an 8-hou day However, other advantages over field budding were apparent:

1. The grafting is done inside on rainy days in the winter time when workmen would otherwise be idle.
2. Somewhat less skill is required.
3. The grafts are first planted in a nursery, where they can easily get the needed extra water and care for the first year.
4. Only grafts that take and grow well in the nursery are replanted in the vineyard: consequently, vineyard space is not idle.

In the winter of 1952 - 1953, Dr. Curtis Alley introduced us to a type of grafting machine, developed at the University by H. E Jacob This machine cuts a tongue and groove pattern in rootstock and scion wood with circular saws. The scion wood and rootstocks cuttings are fitted together, and the grafts are made stable with raffia or budding rubbers.

The main advantage of this machine is speed. With this machine, our men easily turn out 2,000 grafts in an 8-hour day. One man operates the machine and fits the stock and scion. One man ties the graft with budding strips. And one man provides wood for the saw operator and packs the finished grafts in damp sawdust. Thus, three semi-skilled vineyard men, working inside on a rainy winter day, turn out 5 times as many grafts as three men working in that critically short and busy season when field grafting is possible. And none of the men on the benchgrafting crew must be as skilled as the actual field budder.

Benchgrafting in our vineyard is usually done between February 1 and March 15 The grafts are stored in damp sawdust in an unheated barn, where the temperature range would be from 45 to 60° F. The

grafts are usually planted in the nursery between April 1 and 15. Sometimes the buds are beginning to push when the grafts are planted, and one must be careful not to knock them off

Before planting, deep, narrow furrows are cut in the nursery about 4 feet apart, using a chisel tooth The grafts are set in place with the scion at normal ground level Above the scion, between the mounds of dirt on either side, is placed ¾ to 1 inch of sawdust. The sawdust layer may be covered with a very thin layer of soil. The young shoots cannot break through a very thick crust of our clay soil. The dirt for heaping up along the sides of the planted row is taken from between the rows. This hollowed out area provides the furrow for irrigation.

The grafts are brought to the nursery in damp sawdust in grape boxes, and the grafts remain in the damp sawdust until they are actually planted.

As you know, many factors can affect the percentage of grafts that take — water, rodents, insects, soil fertility, etc. If difficulties from these sources are eliminated, we get about 85% to 90% of our grafts to grow.

Over the years, we have made two useful modifications. The original machine cut a 3-finger and 2-slot pattern. If the cuttings were narrow, and not properly softened with water, the machine would tend to shred the ends while making the cuts. Our second machine cuts a 2-finger - 1-slot pattern. On smaller cuttings, the shredding has been minimized.

Another modification is in tying the graft. We formerly used raffia. This is effective, but quite time-consuming. For the past two years, we have simply stapled the grafts together. So far, we think it is just as effective as raffia and more rapid.

We made both of the circular-saw grafting machines. Comparable machines could be made for $75 to $85. The stapler is a large, heavy stapler (Acme No. 1). I am not aware of anyone who sells circular-saw grafting machines

We are very well-satisfied with our present grafting methods as compared with our earlier methods. We are still interested in any new methods that will increase the rate of grafting or the percentage of grafts that take.

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Chairman Lider introduced Mr. Gordon Kershaw of Medford, Oregon, who presented the following paper.