Machine to Disbud Rootstocks

adapted electric bench grinder facilitates disbudding grape cuttings before planting and avoids later growth of suckers

C. J. Alley

Thorough disbudding—removal of all unwanted buds, or eyes—of a rootstock cutting before rooting it in the nursery costs far less in both money and time than removing suckers after the vine has been planted in the vineyard.

An experimental disbudder—designed to reduce labor and increase output—was developed from a double-shafted bench grinder with $\frac{5}{8}''$ shaft and one-half horsepower, seven amp, 3,450 rpm electric motor. Either a saw or a wirewheel may be used as the disbudding unit. The saw unit consisted of three general-purpose saw blades each 7″ in diameter and $\frac{1}{16}''$ or $\frac{3}{32}''$ thick and four aluminum spacer discs each $6\frac{13}{16}''$ in diameter and $\frac{1}{8}''$ thick, flanked on each side by two aluminum spacers which served as depth stops. Simply pushing the bud of the cutting against the saw permitted a cut $\frac{3}{32}''$ deep, and moving the cutting back and forth permitted a cut to any necessary depth. The other disbudding unit consisted of an advanced knot wirewheel, number 809-A, 6″ in diameter, made of 33-gauge wire.

A test of mechanized disbudding was made on cuttings of the rootstocks St. George and 1613, using the two types of mechanized units and—as a check—the manual method of disbudding with pruning shears. The mechanical methods eliminated the need of strong hands to disbud. Manual disbudding by knife is especially uneconomical and fatiguing, and was not included in the test.

Types of disbudding: *Left*—by saw, *right*—by wirewheel.

Work Output

Either shears or saw required an average of 40 minutes to disbud 200 cuttings of either rootstock; the wirewheel took 45 minutes. In the early morning, when the men were fresh, 200 cuttings could be disbudded in 30 or 35 minutes with shears or saw, but the time increased to around 45 minutes by afternoon. Disbudding by wirewheel was definitely slower, regardless of the time of day.

The tendency when first using the saw was to cut too deeply, but once this was overcome a very neat cut was effected. When necessary, the saw could produce a deep cut to remove a deeply embedded bud, leaving a smaller scar than that made by shears in getting a similar deep bud.

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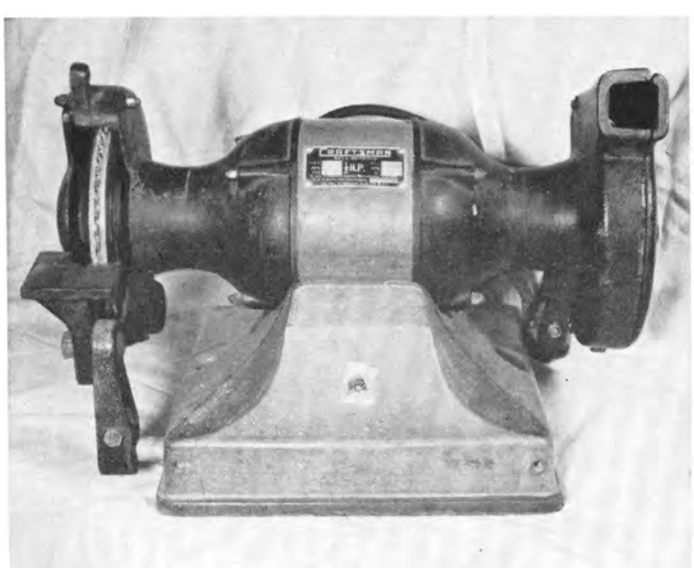
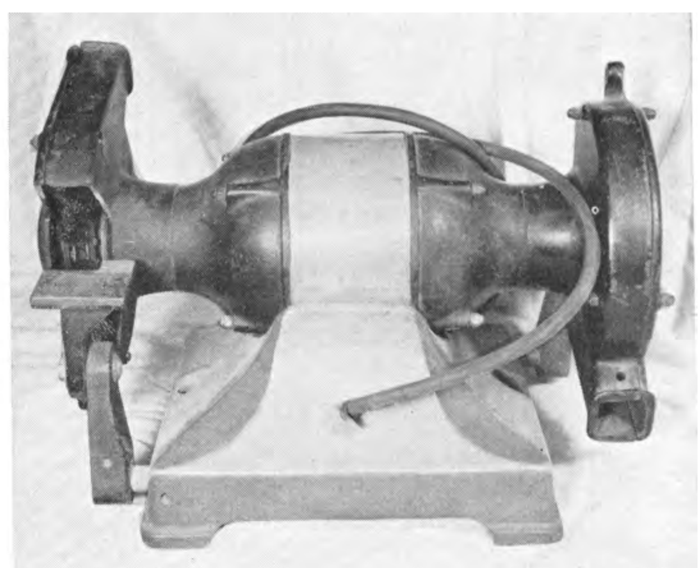
Study of Failures in Disbudding
Each test represents 200 cuttings

Disbudding tool	Difficulty	Rootstock 1613	Rootstock St. George
Shears	Removed only part of bud	3	10
	Missed node	–	7
	Disbudded tendril	–	–
	Total	3	17
Saw	Removed only part of bud	1	15
	Missed node	–	15
	Disbudded tendril	1	7
	Total	2	37
Wirewheel	Removed only part of bud	–	8
	Missed node	–	–
	Disbudded tendril	–	2
	Total	–	10

Disbudding machine showing—*left*—saw, and—*right*—wirewheel.





Citrus Mite Control

effective new acaricide of low toxicity to insects registered for use on citrus

L. R. Jeppson

Relatively safe to handle during spray operations and less toxic to mammals than DDT, Kelthane—4,4′-dichloro-α-(trichloromethyl) benzhydrol—has utility for control of mites injurious to citrus in California.

A residue tolerance of 10 ppm—parts per million—of Kelthane on and in citrus fruit has been established by the Food and Drug Administration. When used at dosages found to be effective in experimental studies and field experience—and not less than seven days before harvest—the resulting residues on harvested fruit should not exceed the tolerance level.

On citrus trees of average size Kelthane—applied at about 16 pounds of the 18.5% wettable powder formulation, or 16 pints of the 18.5% emulsifiable concentrate formulation per acre—has resulted in effective control of both phosphate and Ovotran resistant strains of the citrus red mite—*Panonychus citri* (McG.)—the six-spotted mite—*Eotetranychus sexmaculatus* (Riley); the Yuma mite—*E. yumensis* (McG.); and the Lewis mite—*E. lewisi* (McG.).

When applied by boom equipment with oscillating guns or by conventional sprayers using manually operated guns, 1–1½ pounds of the wettable powder or 1–1½ pints of the emulsifiable formulations per 100 gallons of spray have been effective. Applications of less than 1,000 gallons of total spray per acre—with sufficient concentration of material or volume of spray to obtain 15–16 pounds or 15–16 pints of the formulated material per acre—have proved inadequate. On young trees, 1½ pounds or 1½ pints of the respective formulations per 100 gallons of spray were effective. When spray-blower equipment is used in the citrus red mite control program, Kelthane should be applied at the rate of 16 pounds or 16 pints of the formulated material per acre. The spray volume required for adequate control depends on the degree of atomization and distribution supplied by the spray equipment.

The citrus flat mite—*Brevipalpus lewisi* McG.—appears to be effectively controlled with eight pounds of the wettable powder formulation or eight pints of the emulsifiable concentrate formulation per acre.

Kelthane appears to be compatible with most of the spray materials currently used on citrus. However, it should not be used with the more basic materials such as lime or soda ash. It has been used in combination with petroleum oil sprays, but its value as an oil spray additive for mite control has not been fully investigated.

Kelthane has a low order of toxicity to insects and therefore it has little effect on beneficial insects, including bees.

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in the larval burrows and parasitism of 30% is not unusual.

Another wasp of the family Eulophidae—*Derostenus punctiventris* Crawford—was reared in large numbers from the strawberry leaf miner. It is believed to be a primary parasite of the strawberry leaf miner because as many as eight parasites often develop from a single host larva. In the past the wasp has been considered a parasite of dipterous leaf miners.

Several specimens of still another wasp—*Pnignalio* sp. also in the family Eulophidae—were reared from larvae of the miner.

In the Santa Clara area another eulophid parasite — *Sympiesis stigmata* Girault—was commonly swept from strawberry plants and may be another parasite of this leaf miner.

In addition to parasites there is often a high—20%–30%—natural mortality of leaf miner larvae in the mines. The larvae appear sensitive to desiccating conditions such as might occur from hot, dry winds. In addition, female parasites often sting larvae in the mines resulting in added mortality.

Chemical control has not been necessary. In the 1951 outbreak nicotine sulfate sprayed on the plants at the rate of two pints per 100 gallons of spray per acre killed about 50% of the nonparasitized larvae in the mines and had no apparent effect on parasites or on pupae of the moth.

Because it is possible to upset the natural balance between parasite and host, phosphates or other chemicals for the control of strawberry leaf miner should be applied only on advice of the proper agricultural authorities.

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DISBUDDER

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It is necessary for the disbudder to remove the main bud and the two secondary buds. Removal of only one or two of these buds may result later in the growth of a sucker from the third bud, and the sucker will continue to develop shoots profusely unless it is carefully removed at its point of origin on the rooting.

To determine the cause of suckers that frequently grow from disbudded cuttings, an experiment was conducted with 200 cuttings each of St. George and 1613 rootstocks disbudded by shears and equal numbers disbudded by machine, using either saw blades or a wirewheel. After six weeks in callusing boxes at room temperature, the cuttings were examined to determine the effectiveness of each type of disbudding. All lateral buds that pushed in this time represented potential suckers.

Disbudding by wirewheel was the most thorough of the three methods, because the wirewheel tends to make a rather large scar at the node. The scar may be rough and sometimes very long.

For practical purposes, 1613 was free of potential suckers: less than 1% of the cuttings had buds capable of growing, where the disbudder had failed to remove all the buds of the eye. Disbudding of 1613 is easy because its nodes are distinct and the buds project clearly from the node.

St. George rootstock produces many suckers, and failure to remove the entire bud was the greatest trouble. Other frequent difficulties were mistaking the tendril scar for a bud and failure to recognize the nodal region of the cutting, particularly on basal cuttings, where nodes are indistinct and buds are small and inconspicuous.

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