GRAPEVINE PROPAGATION — FIELD BUDDING, A MODIFIED CUT, AND THE USE OF PLASTIC TAPE

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Field budding of grapevines onto nematode and phylloxera resistant rootstocks was the most common method of establishing vineyards (in the non-irrigated areas) in the coastal counties of California in the past (4). This was done in midsummer, preferably in August, and completed prior to harvest. The three limiting factors to the success of this method were: (a) the availability of mature budwood in early August; (b) having the rootstock in an actively-growing condition at budding time and (c) having at least 6 weeks of warm weather after budding to satisfactorily "callus-in" the bud.

Prior to development of certified grapevines (1, 2) mature budwood could easily be obtained from the non-irrigated hillside vineyards where the vines matured their wood early. The newer vineyards using certified stock were made in the flat, deep fertile soils in valleys where irrigation was available. Under these conditions it was not possible to obtain mature budwood from these vineyards for clean-stock as early as from the older noncertified hillside vineyards, and not much earlier than before the middle of September. In many areas this delay made it too late to bud and get a satisfactory take. In order to use clean budwood, growers resorted to summer budding. Budwood was collected in December and January and placed in refrigeration. In late June, July and even August the rootstocks were budded using this refrigerated budwood. The early budding appeared to be more successful than the later budding. The standard budding technique (5) involves much care and labor and success is not always achieved. A better technique is desired.

The work of Alley (3) indicated that the use of plastic tape instead of budding strips and a modified cut was an improvement over the standard method and gave very satisfactory results at Parlier, California. The modified cut (Figure 1) consists of making about a 25° angle first cut into the rootstock instead of the standard 45° angle cut. This forms a deeper slot into the rootstock when the second cut is made. Similar cuts are made for the bud which gives a longer, more tapered point in front of the bud and allows for a deeper insertion of the bud into the rootstock, permitting a tighter fit. In this study, rootstocks were budded at the end of July by making a deeper cut and using plastic tape. Vines were irrigated the following day, a practice that is not recommended

when using the standard technique. Three buds out of 180 inserted failed to grow. In the spring of 1974 in another experiment using the modified cut and plastic tape 89% successful take was obtained with Cabernet Sauvignon and 88% successful take was obtained with Zinfandel.

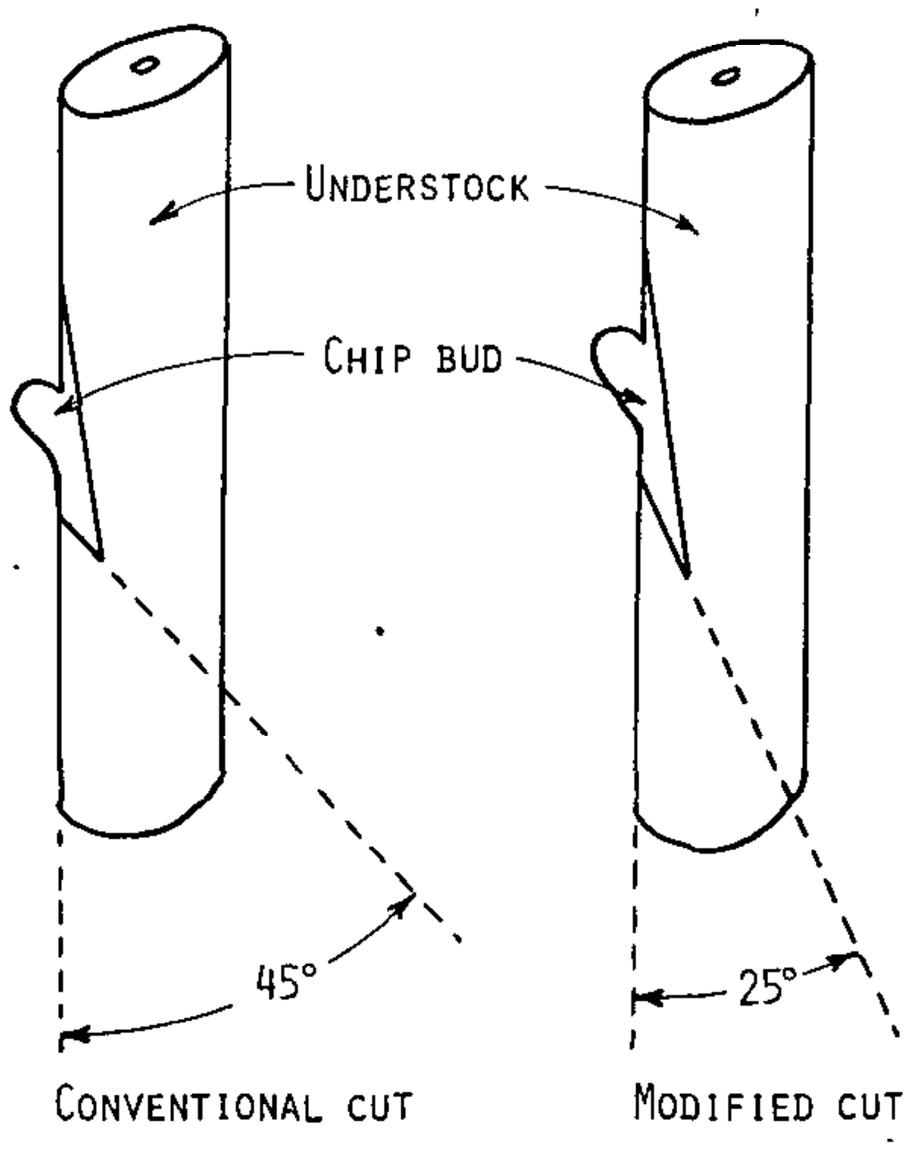

Figure 1. Different angles of cut below bud

In all this work no comparison was made of the take by the use of tape and the standard method. Experiments were made in the fall of 1974 and spring of 1975 to compare the successful take using plastic tape versus the standard technique of using a rubber budding strip (3). Also a comparison was made between the standard technique of tying with a rubber budding strip, both above and below the bud with tying above the bud only.

Fall Budding, 1974. The resistant rootstocks '1613' and 'Harmony' were budded on August 23 using refrigerated budwood; and on September 16 using freshly-cut budwood. There were 20 replications of three vines each per treatment. Treatment consisted of: (a) tying with a rubber budding strip above and below the bud (standard or control); (b) tying with a rubber budding strip above the bud only; and (c) tying with plastic tape above and below the bud. Those rootstocks that were tied with a rubber budding strip were mounded over with soil which is the standard practice, whereas, those budded with plastic tape were left uncovered.

The results in Table 1 indicate that when using refrigerated budwood and plastic tape, the successful take was poorer than the standard method of using a rubber budding strip. However, when fresh budwood was used, plastic tape was as successful as the control.

Table 1. Fall field budding 1974 - Davis, California. Percent successful take. Values represent mean for 20 replications of three rootstocks budded per treatment. Rootstocks used: '1613', 'Harmony'. Budwood used: 'Zinfandel'

	Type of Budwood		
	Refrigeration[6]	Fresh[7]	
Method of Tying Buds	Percent[1] Buds Growing	Percent[1] Buds Growing	Mean[2]
Rubber[4]-above & below bud	86.7[a]	91.7[a]	89.2[c]
Plastic[5] tape	63.3[b]	78.3[ab]	70.8[d]
Rubber-above bud only	93.3[a]	91.7[a]	92.5[c]
Mean[3]	81.1[e]	87.2[e]	

[1] [2] [3] Different superscripts are significant at 1% level.
[4] Rubber budding strip 6 inches long, ⅛ inch wide.
[5] White plastic nurseryman's tape ½ inch, 4 mil.
[6] Rootstocks budded August 23, 1974.
[7] Rootstocks budded September 16, 1975.

The use of a rubber budding strip above the bud only was just as successful as the standard technique. This has considerable significance since it means that the grower does not have to cut the budding rubber in the spring when growth begins, a practice which is necessary when using the standard technique to prevent girdling the shoot. If the budding strip is not cut when the bud starts to grow, as is the case when the bud chip is tied above the bud only, this prevents the bud chip from pulling away from the rootstock if it has not callused in well. Also, it offers added support to hold the bud firmly in place and support the young shoot.

Spring Budding, 1975. The rootstock vines were budded May 1st using the same methods as for fall budding. At this time there were 10 replications of three rootstocks per treatment. The Zinfandel budwood was collected in January and held in refrigeration at 32-34°F until used

The results in Table 2 show that 100% take was achieved by all three methods. Those rootstock vines that were tied with plastic tape and had the tops cut off early (May 12), had formed shoots close to 16" long by June 6. Those rootstock vines whose tops had not been cut off until June 6 had various stages of bud growth from "pushing" to 6" long. On June 18 the rootstocks that had been decapitated on May 12 had shoots 24-36" long, whereas those vines that were not decapitated until June 6 had shoot growth only 2-10" long.

Table 2. Spring field budding - 1975 data on bud push and growth. Rootstock: '1613'. Budwood: 'Zinfandel'.

Method of Tying	Total Vines Budded	Total Buds Growing	Number Buds Growing & Length of Shoots	
			June 6	June 18
Rubber-above & below bud	30	30	29. Buds pushed to 3", one bud to 16"	30 Bud pushed 2-6"
Plastic Tape	30	30	27 see[1]	30 Early-pushed buds 24-36" Late-pushed buds 2-10"
Rubber-above bud only	30	30	23 Buds pushed to 5"	30 Buds pushed 2-10"

Rootstocks budded May 1, 1975; all tops cut off June 6.

[1] Where rootstocks cut off early (May 12) buds pushed 12-16". Where rootstocks cut off June 6 buds pushed to 6".

DISCUSSION

The use of plastic tape greatly reduces the time and labor necessary to bud a rootstock. After budding with tape a grower may irrigate the rootstock vines immediately and not be afraid of a poor take, a practice that is not recommended when using the standard method. Since the take is higher in the spring than in the fall, a grower should strongly consider spring budding when it is easy to obtain mature budwood and climatic and physiological conditions for growth are more favorable.

The use of a deeper cut permits the bud to be placed more firmly into the rootstock making a tighter fit.

From what has been observed by spring budding and using plastic tape the author feels that the following practice can be followed: the vines can be budded, the tops of the vines cut off, and a collar or milk carton placed over the budded vine at one operation. About one month later those vines that have not pushed can be easily seen and rebudded. It is possible to rebud rootstocks 3 to 4 times the same season (up until July 15), so it should be possible to get the vineyard established in one year.

Chip budding using plastic tape has been found to be successful to change over cultivars or correct mixed cultivars in a vineyard that has been trained up the stake and cane-pruned or cordon-trained for the first two years. One or two buds are placed 10-12" below the lower wire and tied securely with plastic tape. The tops of the vines may be cut off at the time of budding or 2-4 weeks later. It takes about 3 weeks before the bud starts to push. If two buds are inserted on opposite sides of the vine trunk, each

bud will form a branch of the cordon. If one bud is used the resulting shoot may be bent to form one branch of the cordon. As soon as the shoot is bent a lateral bud generally pushes at the bend so it can be used to form the other branch of the cordon. Experience of the author with both budding and grafting indicates that chip budding is more successful than the various forms of field grafting.

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