NELSON: LYCHEE GRAFTING

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The propagation of the lychee (Litchi chinensis Sonn.) is best done by air layering or "Chinese layering" (9). This process has been modified by Grove very effectively by the use of a plastic film wrap (3).

Investigation into the propagation of the lychee by budding and grafting has been undertaken at the University of Miami, primarily to establish reliable methods to use in rootstock trials. Established varieties such as Brewster and other promising varieties may show a decided improvement in bearing habits and tolerance to varying soil conditions when grafted onto rootstocks of certain varieties that may influence these desirable characteristics.

Within recent years, a number of promising new seedling varieties from Florida and Hawaii have become available in limited quantities. The rapid multiplication of new fruit varieties is universally accomplished by either budding or grafting methods. The need to top work inferior varieties is now also apparent in many areas of Florida, and reliable methods must be developed.

Investigations into the grafting of the lychee have been carried out in several areas of the world with varying conclusions. Higgins (4) has stated that, with the exception of air-marching, the practice of budding or grafting is seldom applied to the lychee. Realizing the need for rootstock studies which necessitates the use of graftage, he says, "Aside from the advantages of speed and facility in multiplication, budding and grafting afford the opportunity to use as rootstocks other varieties or species which may offer as decided advantages in the case of the litchi as are well known to exist in the case of many other fruit trees."

Methods of grafting lychees are described by Higgins (4) using a bark graft. Pope and Storey (8) tongue grafted one year old seedlings. Cobin (1) reported successful cleft

The less desirable of the bud eyes is then removed by making a cut parallel with the surface of the scion and enough stem tissue is removed to expose the area of cambium. (See Fig. 2). The scion, 1½" in length, will now have one bud eye which will be located on the upper ½" of the scion. There will be approximately ½" of stem below the eye. In the event that both eyes should be of proper development on a scion, the cut can be made by simply splitting the stem, thus giving two suitable scions.

The graft is wrapped with a vinyl plastic film strip ⅜" to ⅝" wide and of suitable length for the stock size used. It is wrapped in a manner that leaves a small opening at the top of the wrap through which the bud emerges (5) (See Fig. 3). After 3 weeks, the stock can either be lopped over as in citrus budding, or the top one half of the stock can be removed. This will force more rapid springing of the bud. Staking and tying is done as on other nursery trees. After 4 to 6 weeks, the film is removed. The stub of the stock above the bud can be pruned back when the scion has attained 4 to 6 inches of growth. It should be painted with wax or some other suitable tree wound paint. Graftage on stocks from ¾" (See Fig. 3) up to 4", using the type of scion described, has been accomplished successfully.

**LITERATURE CITED**


**NOTES ON LYCHEE GRAFTING**
grafting and a method of approach grafting, but attempts with side veneer grafts were unsuccessful.

In an anatomy and secondary growth study of the lychee, Venning (10) found the entire cambium to be active only during the earliest phases of secondary growth. Thereafter, cambial activity varies from place to place around the stem. This may partially explain grafting difficulties when using stocks and scions in an advanced stage of maturity. The success of the grafting, herewith reported, can probably be explained by the use of rather immature scions and a wrap of plastic film. This type of wrap provides an environment that keeps the scion alive for a considerable period of time. In the event that an area of inactive cambial surface is contacted by the scion, this type of wrapper will keep the scion alive until there is a resumption of cambium activity in that particular area.

An interesting item was found in a copy of the Philippine Agriculturist of 1920, by Forman T. McLean (5) on a trip he made into southern China. Part of his observations on fruit orchards growing on hillsides at Lau Kong monastery are as follows: “In these hill orchards there are no citrus (though they are grown principally on terraces in Japan). In fact, most of the species grown are temperate and sub-tropical: chestnuts, Kakis (so-called Japanese persimmons), pears, plums, apricots, Chinese olives (Canarium album and C. pumila), and lychees grafted on mountain lychee. The best orchard belongs to the monastery, which was established during the Sung dynasty (420-479 A.D.) by the founder of the thirty-six villages in the valley and was first a school but was later converted into a monastery.”

“A few notes about the methods of tree propagation may be interesting. The method of grafting trees seems very primitive but appears to be effective. All of the grafts that I saw were either cleft grafts or side grafts on cut ends of branches. These were plastered with red mud and tied with straw. Thus no wax or binding tape was used. Yet by this method lychees are grafted successfully, and these are considered among the most difficult trees to handle, being propagated usually by air layering (marcottage). Another common and effective, though cumbersome, method of multiplication is by inarching. Young seedlings in straw baskets are hung on bamboo frames around a tree, and the small twigs of it are inarched on the seedlings, which are accordingly topped.”

Groff (2) has reported seeing graftage practiced on seedling varieties in China. The method used was to cut back the top of a seedling 3 to 6 years of age, to about 5 or 6 feet above the ground and place in a wedge shaped graft of the desired variety. He states, “The Chinese do not recognize the art of budding and hence do not employ it on the lychee.”

Budding and grafting trials at the University of Miami Experimental Farm on seedling lychees ¾” in diameter, using chip buds, shield buds, and veneer grafts have given successful “takes” and subsequent springing of buds (Fig. 1). These grafted trees, now 14 months from grafting, average ¾” in diameter and 24 inches in height. Proper selection of graftwood appears to be of more importance than either the method of grafting or the condition of the stock in the success of the operation.

Wester (11) suggested using budwood of the following description, “Non petioled, brown-gray, mature budwood.” However, in this experiment the type of scion wood used was from vigorous flushes of terminal wood, still retaining some green color and with prominent axillary buds. The parent trees from which the graftwood was selected had been forced into a condition of vigorous growth by ample quantities of fertilizer and water.
The methods of graftage used were the conventional shield bud, chip buds, and side veneer grafts. Also used was a slight modification of an eye bud (Fig. 2), cut in a manner similar to that used in guava graftage (7). This type of scion cut has an advantage over the other methods in that the bud eye may be wrapped in a manner so that a slight opening can be left at the top of the wrap (Fig. 2). This will enable the bud to emerge before the wrap is removed. After several weeks, when the bud union is further developed, the wrap may be removed. Vinyl plastic film, .0035 inch thickness (6) cut in \( \frac{1}{2} \) inch wide strips, was used for wrapping the buds in a shingle-like manner (Fig. 2), wrapping upward and finishing the wrap by underlooping the end of the film as is done when using a rubber grafting strip.

To force springing of the bud, the stock should be lopped over in the manner used in citrus budding. The lychee, being slower in growth habits than the citrus, should not be lopped over until one month after the graftage operation.

**LITERATURE CITED**