138 which increased the iron content of the leaves as much as 100 ppm. In general where leaves became green, there was also a growth response indicating increased absorption of iron. Analyses were also made for calcium, potassium, magnesium, phosphorus and manganese but the results are not listed since they are not correlated with the chlorosis.

It has been suggested that the chlorosis might be caused by some soil inhabiting insect or microorganism. Although certain organisms may cause chlorosis there is no evidence to show that these trees were so affected. In consideration of these organisms, it was thought that certain soil treatments might reduce the population of most such pests without hurting the trees and that an experiment was needed for information. Therefore, on August 19, 1957, the roots of some trees were drenched with emulsions of dieldrin, ethylene dibromide, and parathion. No effect is as yet visible but recovery from root damage would be expected to be slow.

Of the chelates, only HEEDTA and EDTA are available in Florida at present. DPTA is in commercial production but has not been offered for sale in the Homestead area. Compounds 138 and 157 are experimental materials furnished by Geigy Chemical Company and have not yet been produced in commercial quantity.

Summary and Conclusion. — It has been shown that a chlorosis of avocado trees on limestone soil can be corrected by certain iron chelates, but the trees frequently recover without treatment so the value of most of the chelates is questionable. It is suggested that growers try treating their severely chlorotic trees with 50 grams of iron in the form of NaFe-DPTA or Fe-HEEDTA using 50 gals. of water per tree to flush the material into the soil. These treatments have very seldom failed in our tests but the treatments have not been tried enough on severely chlorotic trees to prove that they will always be effective.

The best material tested was experimental Compound 138 (H FeEDDHA) since it always corrected chlorosis in a short time.

The iron content of the leaves from untreated trees varied from an average of 38 ppm. for yellow trees to an average of 43 ppm. for green trees. Treatment with iron chelates generally caused a small increase in iron content.

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CLEFT GRAFTING GRAPES WITH POLYETHYLENE AND SPHAGNUM MOSS

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In cleft grafting grapes above ground the usual procedure has included mounding the grafts with soil to maintain moisture around unions and promote callusing. This process is laborious and unsatisfactory in many respects. Much soil is moved in the process, vine roots are damaged, graft mounds dry too rapidly, and sprouting of the rootstocks is difficult to accomplish without damaging scions.

In tests at the Watermelon and Grape Investigations Laboratory at Leesburg, Florida, damp sphagnum moss packed around scion and graft union and covered with a polyethylene bag effected successful graft union without subsequent watering or sprouting. Half of the grafts attempted with this procedure were successful even though they had less than usual care.

This was found to be a simple, inexpensive, time-saving method of making grafts in the field.

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Discussion

The cleft graft method of changing grape varieties is a conventional means long used in vineyards, – so old, in fact, that its origin is probably unknown.

The technique of the cleft graft with its accompanying soil mound was usually quite dependable but never economical where labor costs were high. It has continued in use primarily for lack of a better method, and because vineyardists doing their own work could make the graft with little or no actual money outlay.

When vines were to be converted to a new variety of grape, it was only necessary to have a chisel for splitting the rootstock trunks, a sharp knife for cutting the scions of the new variety to the desired shape, a hank of long grass or ball of small cord for tying the trunks, and a spade or shovel with which to mound soil over the finished grafts.

Much labor was involved in soil mounding. The extent of the total operation of cleft-grafting is not apparent until the vineyardist undertakes to convert a goodly number of vines. For example, let us consider this procedure on a per-acre basis. In this case the number of vines changed by grafting is about 500. Five hundred grafts require the digger to move many tons of soil in clearing away the top area and digging out clean soil for mounding.

Not only is a great deal of soil moved by hand, but since the soil for mounding usually comes from the row middles, numerous feeder and other roots are cut or damaged. There are still other disadvantages. Mounded grafts must be watered from time to time during dry spells in the spring to insure successful union of stock and scion. Rootstocks frequently send up sprouts that grow faster than the graft scions and rob them of moisture and nourishment. These "robber sprouts" from the rootstocks may be so numerous that the operator may need to dig into the mounds as many as three times during the spring to remove them. Because the operator cannot see into the mound he must search with the fingers at much risk of displacing the scion and destroying the graft. Graft mounds also take up much room during the spring and interfere with the usual power tools used in vineyard cultivation.

The obvious disadvantages of the standard soil-mounded cleft graft prompted attempts to devise a simpler and less costly method. These attempts led to the following method, using polyethylene plastic and *sphagnum* moss.

Twenty grape rootstocks were selected, ten of which were one year old Carrignane plants from California. About February 1, two weeks before breaking of dormancy, these were cleft grafted and planted in 7 inch clay pots.

Ten cleft grafts were made in the vineyard on four-year-old Lake Emerald vines with stumps about two inches in diameter. All stumps were sawed off approximately two and one half inches above ground level. Scions eight inches long with top bud near the apex were grafted in the conventional manner i. e., by splitting the rootstock stumps and inserting scions cut to a wedge-shaped taper with tongue about one and one-half inches long. The cambium of both scion and rootstock were made to meet and cross slightly, and the finished grafts were tied with raffia.

Clean, damp (but not wet) sphagnum moss was then packed around both the scion and the area of the graft union. The sphagnum packing was carefully distributed about all sides of the scion and rootstock and fastened in place with tying raffia or light rubber bands. A two quart polyethylene bag (as used for home freezing) was next pulled carefully over each graft and tied tightly with raffia at ground level to minimize loss of moisture. Finally, about one pint of clean surface soil was placed around the bottom edges of each bag.

The grafts were left undisturbed for a callusing period of 30 days. At the end of this time a small slit was cut in the top of each polyethylene bag and the opening eased gently down over the top bud of the scion and tied snugly just below it. Thus the sphagnum moss was still securely bagged to hold moisture while the top bud of the scion was left open to grow without restriction.

Stakes of wood or metal were placed beside each plant, and the fast-growing buds were tied to them with raffia. Most of the grafts grew so rapidly that the tops were pinched off within three weeks to encourage lateral growth along the trellis wires.

In the absence of graft mounds, the care of the growing vines was simplified and sprouting off outside suckers from the rootstocks presented no problem. Only a few weak rootstock sprouts grew inside the polyethylene bags. When the grafts were three feet high, the polyethylene bags and any inside sprouts were removed. The sphagnum moss packing was saved for re-use.

More accurate timing is required in making the polyethylene and sphagnum moss cleft graft, but this new method required less labor and attention. In this test very young transplants and old, oversized stumps were used. Both represent extremes and are the most difficult of all vines to cleft graft. The most suitable age for rootstocks in this type of operation is one year from planting in the vineyard.

Summary and Conclusions

About fifty percent of cleft grafts covered with damp sphagnum moss and polyethylene bags made union between scion and stock even though they got less than usual care. If compatible scions were grafted on one-year-old stocks by this method, 80 to 100 percent successful graft unions might be expected.

COMMERCIAL POTENTIAL OF YUCCA ELEPHANTIPES

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The recently renewed interest in naturally occurring vitamins has prompted a rather wide spread search for commercial sources.

It is believed that a commercially potential source of vitamin C may be developed from one or more species of *Yucca*. One particular species under present investigation is *Y. elephantipes*, also known as *Y. guatamalensis*.

Bailey (1) described the plant as becoming a rather large tree with swollen base; leaves not pungent, two to three inches wide; fruit yellow. It is indigenous to S.E. Mexico. The growth range is very wide, it being planted as an ornamental in many parts of the tropical and subtropical world.

This particular species is thornless and evidences a very rapid growth under south Florida conditions. The plants under observation seemed disease free. No evidence of root knot susceptibility has been found. The plant responds quickly to good horticultural practices.

A small unselected planting was made in the latter part of July 1957. The planting averaged 2 feet in height initially; however, by the first of October 1957, there was a doubling in size.

Analyses for leaf content of vitamin C were made in July and October. These analyses

TABLE 1

Vitamin C Content of Leaves of *Y. elephantipes* (mg. per 100 g. Fresh Wt.)

Leaf Age	Sampling Dates	
	July	October
	mg/100g.	mg/100 g.
Young leaves	2,100	2,150
Maturing leaves	3,150	3,075
Old mature leaves	3,220	3,200