DR. ANDREW LEISER: Harry Kohl has tried it with azaleas but has not been successful yet. They live for a period of time, make little growth, and give up.

II. Commercial Production of Fruit Trees

MODERATOR: Mr. Walter Krause

DECIDUOUS JUNE BUD FRUIT TREES

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Deciduous nurserymen are confronted with a myriad of problems, many of which are self inflicted. Not the least of these is our terminology or nursery jargon. I have always considered the terms "June bud" and "Yearling" as problems which the nursery industry has inflicted upon itself. A June bud may or may not be budded in June and a Yearling, which to the novice sounds like a year old tree, is actually a two year old nursery plant. Confusing as these terms are to some, they are the terms we use in the trade. Therefore, it might be fitting to start a discussion of deciduous June bud fruit trees with a working definition. I would like to suggest the following:

> The term "June Bud" refers to a budded deciduous fruit tree which is grown in a single season, achieved by early budding and rapid forcing techniques, produced primarily for the commercial orchardist who frequently contracts for the trees prior to budding.

To further clarify our understanding of the term "June Bud," as differentiated from a "Yearling," our discussion will center around several features which characterize this important type of deciduous nursery product and the techniques used in its propagation.

The Deciduous Varieties Most Commonly June Budded: The varieties of fruit trees which lend themselves most readily to June budding consist primarily of the stone-fruits including peaches, nectarines, almonds, apricots and plums. These are most commonly grown on peach seedlings, less often on plum cuttings and occasionally on almond rootstock. Our firm plants its seed and cuttings on a 3″ spacing, thinning to 6″ before budding. This is true of both June buds and Yearling stock.

The Time of Budding: The June bud is budded just as early as the understock and scion wood will permit. In our central valley of California such conditions are usually found by approximately May 15th. By this date, the understock may be 12″ or more in height and perhaps 1/8th″ caliper. The scion wood, which consists of the current year's growth, is usually large enough and mature enough by this date to permit budding.

The terminal dates for June budding are almost as important and critical as the starting date. In our southern San Joaquin location we prefer not to June bud beyond June 15th. However, due to late contracts we frequently do not finish our program until the end of June or even the first week of July. The terminal date is important and the ultimate size of the nursery stock is adversely affected with each week of budding after the mid-point of June.

The Length of the Growing Cycle: A June bud deciduous fruit tree is produced in a single growing season, usually within nine to ten months from the planting of the seed (if spring planting practices are followed). This growing cycle is contrasted to a two year growing period for a Yearling fruit tree.

This short growing season makes the early budding a necessity. It also requires a series of cultural operations designed to force the bud into immediate and rapid growth, uninterrupted throughout the entire growth cycle. With the June bud, time is the essence of success. There is no second season to correct the errors of the first, or to make up for delays or improper cultural practices.

Special Budding and Forcing Techniques Used in June Bud Propagation: The following steps used by our firm are probably quite typical although there are certainly differences in specific techniques between various fruit tree nurserymen, somewhat governed by soil and climatic conditions. Terminology, too, may vary somewhat, but I believe this description, coupled with the slide presentation, will adequately illustrate the budding and forcing techniques involved.

1. *Budding:* Most nurserymen employ the T budding technique in the propagation of June buds. This is usually coupled with another special technique referred to as "wooding the bud." This latter practice is one in which the bud is almost, but not quite, sliced from the budstick. A second knife cut is made at right angles to the first, cutting only through the bark above the bud. The bud is then lifted from the budstick leaving the tiny silver of wood beneath it still connected to the budstick. This practice permits the concave layer of the bud, free of any wood, to fit snugly around the cambium layer of the understock when inserted into the T incision. This process gives maximum contact. Due to the small diameter of the seedling at the time of budding, the tiny bud may actually wrap almost halfway around the stock.

June buds are budded higher on the stock than Yearlings. The buds are usually inserted some 5 - 6″ above the ground when June budding. The reason for this height is to assure maximum leaf area below the bud which is required during later forcing operations.

June buds are usually tied with rubber. We use 4″ x 3/16″ x .010 rubber budding strips.

2. *Topping*: We consider the newly inserted bud knit to the stock four days after budding. At this time the first forcing

technique is started. This consists of topping the understock. At least half of the stock is cut away and frequently all but 4″ of the stock above the bud is removed in this operation. This step is designed to force the bud into immediate growth just as soon as the bud and understock are knit.

3. *Stubbing*: Two weeks after budding, or some ten days after topping, a second pruning operation takes place. At this time, with the bud already beginning to grow and forming its first leaves, all of the stock above the bud is cut away. This is usually done at the top of the T incision. If the budding rubber has not already snapped off, this cut usually accomplishes the process.

4. *Nipping*: Within another 2 - 3 weeks the bud has grown 8 - 12″ in height. During this growing period one to several nippings are made on the rapidly growing sprouts of sucker growth below the bud. Care must be taken not to eliminate the entire leaf area, but only to nip this growth and reduce its rampant vigor. Leaf area below the bud at this stage is essential.

5. *Clean-up*: The final step in the early forcing technique is generally referred to as clean-up. This consists of completely removing all sucker or sprout growth below the bud. This step should not be done until the bud has reached a minimum height of 8 - 12″. Frequently this can be delayed until the bud is 18″ or more in height. Until this minimum height is attained the plant must have the additional leaf area below the bud to compensate for the severe pruning above the bud and to help balance and feed the root system.

As the weeks progress after the initial clean-up, one or more additional clean-up or suckering operations should be carried out to keep the lower trunk free of growth which could compete with and retard the growth of the bud.

After these initial forcing techniques are accomplished, the goal is to encourage uninterrupted growth of the bud throughout the balance of the growing season. To help achieve this goal, our firm practices a pre--fertilization program for June buds, applying 500 to 700 cu. ft. of #1 chicken manure per acre some seven months before planting. This nutritional program coupled with frequent irrigations on perhaps a 7 - 10 day cycle and a constant and vigilant pest control program results in a rapid and uninterrupted growth pattern. It is highly desirable to maintain a strong central leader. This can best be done by controlling pests, particularly thrip. As the tree grows and limb development gets well underway, we usually perform a limbing operation up to a height of some 8″ above the bud union.

The Market for Which the June Bud is Grown: June buds are primarily grown for the commercial orchardist. They frequently are grown under contract, entered into during the budding season or just prior to this, to meet the specific field planting requirements of the farmer. There are a number of reasons why the June bud is suited to this market:

1. *Price*: The June bud is generally priced lower than a Yearling. There is frequently a 5c to 10c difference in price between comparable grades.
2. *Speed of Production*: A June bud can be delivered some six months after the orchardist has contracted for the trees and the stock has been budded. This compares with sixteen to seventeen months with a Yearling.
3. *Ease of Transplanting*: The June bud normally peaks on $\frac{3}{8}''$ to $\frac{1}{2}''$ and $\frac{1}{2}''$ to $\frac{5}{8}''$ caliper, if all growing and cultural practices are carefully controlled. This tree size is considered by many to be the ideal size for transplanting. The one year root is harvested with less pruning than a two year root system and hence transplants with a minium of shock.
4. *Ease of Training*: The commercial orchardist frequently prefers to train his own scaffold. June buds normally have a better and lower limb development than a Yearling. The lower limbs on a Yearling tend to shade out and this can seriously limit the orchardist in his scaffold building.

The Exacting Quality Standards Demanded by the Commercial Orchardist and State: The high capital investment of an orchard program and the competitive market which confronts the orchardist, has forced him into demanding a nursery tree combining high productivity, the finest of fruit quality and stock free from the more serious and common diseases and virus problems. These rigid requirements are true of both the rootstock as well as the scion. In these demands the orchardist has been strongly supported by the State Department of Agriculture and his County Agricultural commissioner.

These quality standards have resulted in a number of highly important and effective cultural changs in June bud culture during recent years. These new practices have been widely accepted and put into practice by most of the nurserymen growing and supplying June bud trees.

1. Rigid and State regulated soil fumigation practices for the control of nematode.
2. The development of vigorous new rootstocks highly resistant or immune to nematode.
3. Sanitation techniques during the preparation and planting of nursery seed, liners and cuttings.
4. Scion wood selection from the most productive and highest quality strains, indexed for freedom from the more common and detrimental viruses and planted into indexed scion orchards under the nurserymen's jurisdiction.
5. The development of a State certification program to encourage and promote the elimination of viruses and the development of so-called indexed or "clean" stock.
6. The development of index programs and heat chamber equipment by individual nurserymen designed to expedite and lower the costs of the "clean-up" program.

Conclusions: *The Ultimate Product*: If the forementioned cultural practices, are carefully observed and carried out to near perfection, coupled with excellent weather conditions, the final product will result in a June bud which perhaps peaks on 3/8″ to 1/2″ or 1/2″ to 5/8″ in caliper and with a height of some 3 to 5 ft. This tree was frequently grown on nematode resistant rootstock. It most certainly was grown on fumigated soil assuring freedom from nematode at the time of delivery. It most likely was grown with indexed rootstocks. It is obvious that the June bud of today has been designed and produced from start to finish to meet the exacting requirements of the commercial orchardist and the state.

Perhaps the day will come, when the nursery trade will develop a term better suited and more descriptive of this highly developed product. Until such time, we will continue to refer to our one year old fruit tree as a "June bud."

YEARLING FRUIT TREE RAISING IN IDAHO

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Peach root is used predominately for all varieties of peach, plum, and apricot except on heavy soil; then plum root is preferred. Lovell pits are used mostly and planted in rows 42 inches apart. Planting is done here about the first of October as we have two weeks of irrigation season left to soak the ground well before winter sets in. Pits are then covered with one inch of soil and 2 inches of sawdust. After this has been done a disc hiller is used to cover the sawdust 2 to 3 inches deep to prevent it from blowing away over winter and early spring.

Usually about the 10th of May the seedlings emerge. When the seedlings first come through the ground they are very susceptible to frost. Some years we have had as much as 80% loss by frost. This is why we plant 15 to 20 pits per foot. If germination is good and we have no frost we have far in excess of seedlings necessary for proper stand so we have to thin to 2½ to 3 inches apart. We have had a spotted stand upon some occasions and with careful handling and lots of water seedlings can be thinned and transplanted and get a very desirable seedling for budding. Transplanting is done only on abnormal years of weather or stand. Thinning is done when the seedlings are about 6 to 8 inches high. Seedlings are cultivated at 10 to 14 day intervals until about August 1st., when we start budding. Seedlings are 5/16 to 3/8 inch caliper when we start budding and 3/8 to 1/2 inch caliper when budding is completed. We spray twice, about July 10 and August 1st. for control of peach borer.

We raise about 12 varieties of peaches, about the same of plums and prunes and four varieties of apricots. Buds are placed on the north east side of the seedling about 2 inches