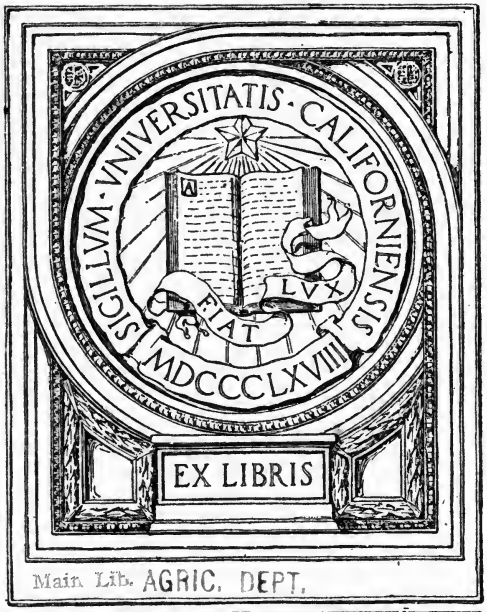
CITRUS FRUITS IN CALIFORNIA

ROEDING & WOOD NURSERY CO.



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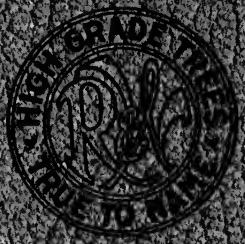


ROEDING & WOOD NURSERY CO
NO. 1693 EAST WASHINGTON STREET
LOS ANGELES, CALIFORNIA, U. S. A.

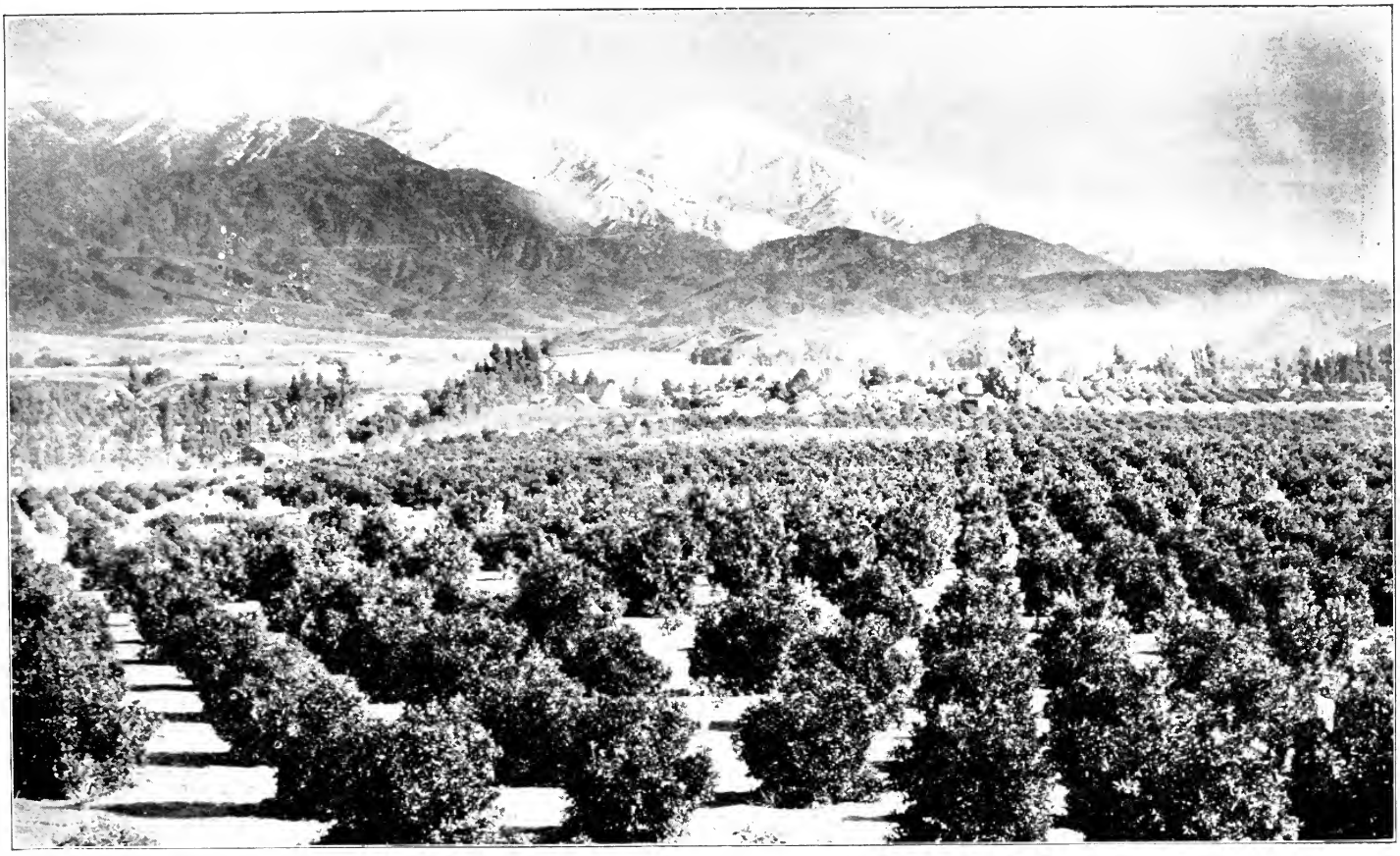
CITRUS FRUITS IN CALIFORNIA

A MONOGRAPH

Describing the Basic Principles and Practices of Successful Citrus Fruit Production, from the Planting of the Tree to the Harvesting of the Crop

GEO. C. ROEDING, ... President
W. R. WOOD, . . Vice-Pres. and Manager

PUBLISHED BY THE
ROEDING & WOOD NURSERY COMPANY
NO. 1603 EAST WASHINGTON ST.
LOS ANGELES, CAL.



From snow-capped mountains to verdant orange groves in mid-winter in California

RETROSPECTIVE AND PROSPECTIVE

In presenting this cultural book on citrus fruits, we want to thank our friends and patrons for the many favorable comments on our stock, which has been the means of an ever increasing patronage from strangers. As a result of this increase in business, we have deemed it necessary to issue a treatise on citrus fruits covering their culture in a more complete and general way than it was treated in our booklet "Citrus Fruit Culture."

Nursery rows of young citrus trees.

Realizing that success depends upon satisfied customers, we shall strive to come as near perfection as is possible, both in the selection of soil and climatic conditions, as well as in the care and management of the growing nursery stock.

In our effort to secure these conditions, we have made numerous experiments in different localities where conditions seemed to be favorable for the growing of perfect citrus trees. As a result we have selected a location at La Habra, Orange County, California, where both soil and climatic conditions are most favorable for this work, and we feel assured that we shall be able to grow a very superior quality of tree.

Owing to the fact that we have planted all of our Exeter lands to orchard, and that in the future all of our nursery stock will be grown at La Habra, has made it necessary to change our principal place of business to the city of Los Angeles, where we shall maintain an office and sales yard in the future, and where we shall be pleased to meet all who are interested in citrus culture.

We shall be pleased to have those interested visit our nurseries at La Habra, where our superintendent will show you the stock and explain our methods of growing and handling the same. We realize that in order to insure the best results in citrus planting the tree must be properly grown, dug and packed; and to this end we shall spare no effort to insure all stock being delivered in the best possible condition.

Many years' experience in handling nursery stock have qualified us in the digging and packing of trees, so that our customers can feel assured that their trees will have every attention necessary up to the time they leave our hands, and if the instructions in the planting, care and management of the orchard, which we have given in this book, are followed out, the planter will experience no difficulty in realizing a profitable citrus orchard.

THINGS TO OBSERVE:

How to Order

1. In ordering trees, always be particular to write the order plainly, stating quantity of trees desired, variety, age and size; also whether trees are to be balled or naked roots.

Digging and Packing

2. The nature of the soil on which all of our stock is grown, makes it possible for us to take out balled trees in perfect shape without disturbing the roots or shattering the ball, thus reducing the shock to the tree to a minimum.

In making up naked root trees we exercise every precaution to save all of the fibrous roots possible, and all trees are carefully packed so as to insure their safe arrival at destination in good condition.

3. Our packing and labeling are as perfect as possible, and we charge for the same only to cover the cost of material. All trees are delivered at the railway or express office free of charge.

Directions

4. State distinctly how you wish us to ship—by freight or express; also designate the route, otherwise we use our own discretion in forwarding.

Responsibility

5. After delivering to the carriers we cannot hold ourselves responsible for any loss or injury to trees or plants after they have been carefully packed and shipped; but we will do everything in our power if any loss should occur for the protection and recovery of our customer's property.

6. If any mistakes are made in filling orders, we will cheerfully rectify the same, but must respectfully request customers to notify us at once; **or, at the most within ten days after receipt of the stock.**

7. Orders from unknown correspondents must be accompanied by a remittance or satisfactory reference.

8. A deposit of 20% is required on all orders for Citrus trees.

Price List

We publish annually a price list of all nursery stock grown by us and enumerated in this catalogue. When ordering always consult this for prices. Write for special prices on large orders.

OUR GUARANTEE

All of our stock, as far as possible, is budded from bearing trees, and we take every precaution to have the stock true to name; still, with all our care, mistakes are liable to be made, but we hold ourselves in readiness—on proper proof—to replace all stock that may prove untrue to label, free of charge, or to refund the amount paid. This statement is due notice to purchasers of nursery stock, of the extent of our liability after same has been accepted by the buyer.

Address all correspondence:

THE ROEDING & WOOD NURSERY CO.,

1603 E. Washington St., Los Angeles, California.

CITRUS CULTURE IN CALIFORNIA

It is unnecessary to go into detail regarding the early introduction of citrus fruits in California, as all are more or less familiar with the early history of the industry in this State. Our purpose is to treat of conditions as they appear at this time.

Citrus fruits are grown commercially, from the extreme southern end of the State to as far north as Butte County. Recent statistics show that there were growing in the State in the spring of 1910 nearly eleven million bearing trees and nearly two million not yet in bearing.

The greater percentage of these trees are growing in the southern part of the State, there being over ten million in the four counties of Los Angeles, San Bernardino, Riverside and Orange, and nearly another million in the counties of Santa Barbara, Ventura and San Diego, leaving but two million for the balance of the citrus producing part of the state. Of this amount Tulare County claims over a million trees.

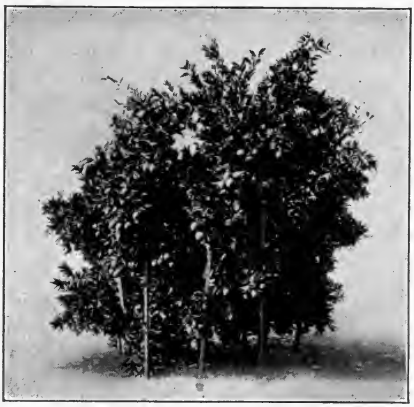
This by no means indicates that the territory adapted to citrus culture is limited, or that these sections are more desirable than others for the production of citrus fruits. Like other horticultural enterprises, the citrus industry has been confined to sections where success was first achieved; new sections being opened up only when the older ones had all been planted or when prices of land, as a result of the successful growing of citrus fruits, had passed the limit of the planter's pocketbook, or where the adventurous spirit of some pioneer prompted him to try the experiment of growing citrus fruits where they had never before been tried.

Even with the great acreage of citrus fruits now growing in the State, not half of the land suitable for their culture has yet been utilized. The planted area in the San Joaquin Valley is merely a speck compared to the vast acreage yet unplanted, the most of which is equally as good as any that has come under cultivation.

Thus it will be seen that citrus culture is practically unlimited in this State, and it is gratifying to know that even though the industry has expanded by leaps and bounds during the last ten years, yet with all the citrus fruits produced (nearly 50,000 cars the past season) the demand is keeping pace with the production and will no doubt continue to do so for years to come. Nor is this to be wondered at when we take into consideration that the one variety, the Washington Navel, the orange that has made California famous, has never been successfully produced in any other part of the world, excepting in California and parts of Arizona, while in these sections it grows to perfection. The dry hot summers of the San Joaquin Valley are particularly favorable for the growing of the Washington Navel; there it attains the highest degree of perfection. The warm summers seem to have a tendency to mature the fruit much earlier than in other parts of the state; much of it being sufficiently well matured in time for the holiday trade, thereby realizing the best market prices. For this reason we advise those contemplating the planting of citrus fruits in the San Joaquin Valley, to plant the Washington Navel.

Of all the varieties of oranges grown in the state, the Washington

Navel is the most popular and the most largely planted, in fact only one other orange is grown to any considerable extent and that is the Valencia Late, which, owing to its lateness in ripening and its good keeping qualities (the fruit often hanging on the trees until October), causes it to be very desirable and makes it possible for California to ship oranges every month in the year. It has only come into prominence in California within the last few years, but as the desire



A young Navel tree properly propped.

for oranges the year around has developed among all classes of people, the Valencia has become a necessity, being the only orange thus far that can be successfully held on the tree until late summer and fall; it has created for itself a place in the citrus industry of the state next to that of the Washington Navel. It grows to perfection in the warm sections of Southern California, where the chances of killing frost are removed. Particularly does it do well on the lighter soils, where it not only is thin skinned, but full of juice and also retains its bright orange color and maintains its firmness late as the middle of October. On the heavier soils it is apt to turn green again about June or July, and though this does not affect the quality of the fruit, its outward appearance lessens its commercial value.

Few other varieties of oranges are grown in the state very extensively, their culture being confined mostly to family orchards for home use. Among these may be mentioned the Ruby Blood, Paper Rind St. Michael, Mediterranean Sweet, together with the Mandarin types, of which the Dancy Tangerine and Satsuma have first place.

Lemons are fast coming into prominence in California but the tree being more tender than the orange, their culture is less general. The five southern counties, viz.: San Diego, Orange, Los Angeles, Ventura and Santa Barbara, are more favorable for lemons. The best results have been obtained along the foothill sections of these counties where the climate is moderated by the ocean breezes, which seems to be conducive to the production of fruit the year around —a matter of vast importance to the lemon grower. However we do not wish to be understood as saying that lemon culture is geographically limited in this state. To a greater or less extent lemons are grown along the entire length of the San Joaquin Valley, and the quality of the fruit is of the best. Climatic conditions, however, are such that few summer lemons are produced in this section, the bulk of the crop maturing in the fall and winter months. Quite a portion of this fruit matures early enough in the fall to still reach a good market at a time when foreign importations are light and usually brings good returns. That part of the crop coming off during the winter months has to be stored until spring before it can be sold to advantage.

Pomelos, commonly known as "grape fruit," are being more largely produced in California than in former years. This fruit has not met with the favor that it should, from the buyers, and in our opinion this is due largely to the fact that the fruit has been placed on the market before it is sufficiently matured to be at its best. As a result of this the consumer has condemned California Pomelos.

Pomelos are grown in all localities where orange and lemons thrive, although the tree when young is more susceptible to frost than the orange. The soil and climatic conditions in the citrus belt of the San Joaquin Valley seems to be particularly adapted to the growing of the Pomelo, and we think the quality of the fruit is superior to that grown nearer the coast. The productiveness of the trees, together with the prices obtained for the fruit, makes it a very remunerative crop.

MODERN METHODS IN CITRUS CULTURE

The eight essentials in the planting and caretaking of a citrus orchard may be tersely summarized under eight counts, as follows:

1. Preparing the land.
2. Distance to plant.
3. Laying out the ground.
4. Selecting the trees.
5. Proper methods of planting.
6. The tree; the soil; the care.
7. Care of the orchard.
8. Fertilizers and fertiliaztion.

Preparing the Land

We will assume that the intending planter has selected his land in a suitable location for the variety that he has decided upon planting. Should the land be uneven, the first thing to do will be to have it graded so that there will be no question about the irrigating water running over every part of it. The planter cannot be too particular about this part of the work as it is not only expensive but hazardous to grade land after it has been planted. If there is any question about the water not running over the ground, it is best, if the water is obtainable, to plow furrows over that part of the land you are uncertain about and run the water through the furrows to test it out. In fact, it is customary in some localities to require the party who contracts to do the grading to run furrows 20 or 30 feet apart and run the water through them before paying for the work.

After the grading is properly done, the whole tract should be plowed to the depth of 12 inches and well harrowed down so as to be free from clods. The plowing should be done in the winter or early spring after there has been enough rain to wet the soil down to the depth that you wish to plow. If properly plowed and harrowed, the land should now be in a fairly level condition, free from clods and ready to lay off for planting.

Distance to Plant Apart.

This question should receive serious consideration of the planter, as, unlike planting ordinary farm crops where a mistake can be rectified the following year, the citrus orchard is planted but once in a lifetime. The different varieties should be planted according to the growth and habit of the trees, the idea being at all times to plant far enough apart so that the trees will not be crowded when full grown, and so that the sunlight will, at some time during the day, reach nearly the whole outer surface and as much of the ground around the tree as possible. The soil needs a certain amount of sunlight and air to keep it in a fertile condition, and the tree must have sunlight and air or it cannot produce fruit. Planted too closely and where they crowd each other causes the tree to only produce fruit on the top, which gets the required light and air. The sides of the tree and lower limbs, where the fruit should be produced, remain barren.

The Washington Navel and other varieties of similar growth should not be planted closer than 22 feet each way. It is our opinion that 24 feet would be better in localities where the soil is such that more than ordinary growth may be expected. The Washington Navel is not usually a rapid or vigorous growing tree. Where it is planted in light alluvial soil it makes a much larger tree than where planted in heavier soil. For this reason we would advise planting at a little greater distance apart under such conditions.

The Valencia Late should be planted 24 feet apart each way, and possibly 25 or 26 feet would be better in some localities, as it is a vigorous grower. It requires more room than the Washington Navel to produce the best results.

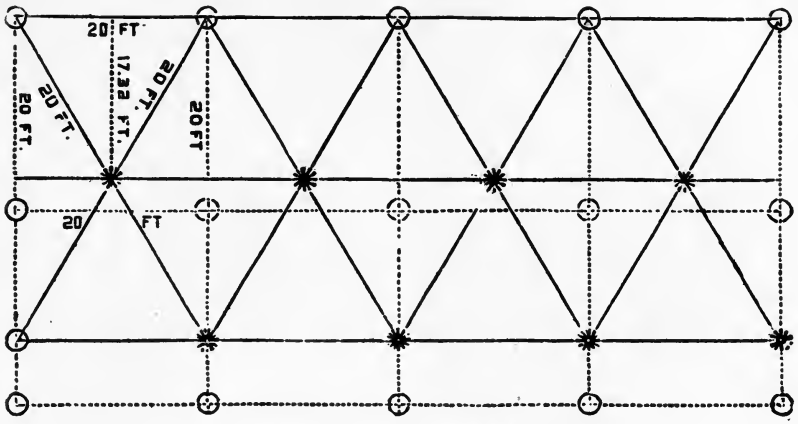
Lemon trees should also be planted at least 24 feet apart, as they are much more vigorous than any of the budded oranges and require quite severe pruning to make them fruit properly. The common practice of pruning, and that which is generally accepted as the best, is to keep the tops well pruned, which forces the side branches to spread out, thus requiring that they be planted a little further apart in order to afford room for this spreading, as well as for room to work around them.

Some of the slower growing varieties, such as the Satsumas (Oonshius), Mexican Limes and Kumquats, can be planted as close as 14 or 16 feet apart each way, as they never make a very large tree.

The Laying Out of the Ground.

The first thing is to decide what system or method you are going to use. The two most practical methods used in citrus planting are the square and the equilateral triangle systems, both of which are herewith illustrated. The accompanying table gives the number of trees or plants that can be planted at any given distance apart.

We think that the square method will generally give the best results, and recommend it in preference to the equilateral. While the last named gives a few more trees to the acre and



Square and Equilateral Triangle Methods.

DISTANCES APART	Square	Equilateral Triangle
12 feet apart each way	302	348
14 " " " "	222	256
15 " " " "	193	222
16 " " " "	170	196
18 " " " "	134	154
20 " " " "	108	125
20x22 feet apart	99	.....
22x22 " "	90	103
22x24 " "	82	.....
24x24 " "	75	86
26x26 " "	64	73
30x30 " "	48	55
40x40 " "	27	31
50x50 " "	17	19

RULE SQUARE METHOD—Multiply the distance in feet between the rows by the distance the plants are apart in the rows, and the product will be the number of square feet for each plant or hill; which, divided into the number of feet in an acre (43,560) will give the number of plants or trees to an acre.

RULE EQUILATERAL TRIANGLE METHOD—Divide the number required to the acre "square method" by the decimal 866. The result will be the number of plants required to the acre by this method. See diagram.

Pomelos are of a vigorous nature and to get the best results they should be planted at least 24 feet apart each way.

The one idea for the beginner to bear in mind is that it is far better to waste a little ground, if you might term it that, in getting an orchard planted seemingly too far apart, rather than too close.

apparently gives the same amount of room between the trees, yet as the trees get older they will come nearer to occupying all the space, consequently giving less room for cultivation and harvesting the crops. This is an important item in both the cost of caring for the orchard and in its productions. We would advise those wishing to plant by the equilateral method to use it with the idea of giving the tree more room rather than to get more trees to the acre, that is, if by planting 22 feet apart by the square method, which would give you 90 trees to the acre, the planter could use the equilateral triangle method and plant them 23 feet 6 inches apart, thus giving the tree an additional foot and a half more space.

In laying out the ground be careful to get the rows straight and all the same distance apart, then the trees will line from every direction. Nothing so mars the appearance of an orchard as crooked and irregular rows. It is just as easy to have them planted straight if a little care is used.

After the tract has been properly staked, the holes for the trees should be dug—that is, provided the trees are ready for delivery, as it is best not to have the holes open too long before planting on account of the ground drying out. The holes should be dug not less than 18 inches deep and 18 inches in diameter. This allows plenty of room to work the soil around the roots of the tree, or around the ball if balled trees are used. With balled trees it is best not to dig the holes too deep, as the tree is sure to settle when the water is applied. This will necessitate raising the tree again. In cases where it is necessary to dig the holes deeper on account of blasting for hard pan, the soil should be settled in the bottom of the hole with water before planting.

Selecting the Trees

The beginner should exercise care in selecting his trees. While chances of getting trees that are not true to name are not as great as in former years, yet it behooves the planter to buy his stock of an established nurseryman, where every care is exercised to properly grow the tree. He is not only sure of getting a tree that has been properly grown, but if a mistake occurs in the variety or name, the responsible nurseryman is always ready to rectify the error. A few cents difference in the price of a tree is a small item when you take into consideration the difference between poorly grown trees and good ones.

Tree trimmed ready for packing.

Whether to plant balled or naked root trees is a matter that should receive consideration. We advise plant-

ing balled trees where conditions are unfavorable, as a balled tree is in condition, if properly taken up, to stand more hardship than one with naked or open roots.

Naked root trees are often planted with good results and with little loss, but if a large acreage is being planted and the work of planting has to be intrusted to hired help, it is best to plant balled trees. The loss will be very light unless they are absolutely neglected, and this difference will often more than cover the additional cost of balling and freight charges. Another advantage of the balled over naked root trees is, it is not necessary to plant immediately upon arrival. They can be held in a lath house or shed for several months should conditions require it, and by sprinkling them to keep the balls moist, they will keep in perfect condition and be ready to plant at any time. In balling trees they should be taken out carefully so as not to shatter the ball or disturb any of the roots contained in it, as by so doing the advantage of balling is lost. We take particular pains along this line to see that the men engaged in the work use every precaution to get out a perfect balled tree. We have gone to considerable expense in selecting soil suitable for balling purposes, hence we feel that we can furnish customers perfectly balled trees.

We also take every precaution in taking up naked-root trees, and where excessive freight rates prohibit the use of balled trees, we can furnish naked-root trees taken up under the most favorable conditions, and properly packed so as to reach destination in a growing condition, no matter how distant. Naked-root trees should first be topped in the nursery and defoliated, at the same time the tap roots should be cut. This causes the tree to return to the dormant state and just as the buds begin to swell and the trees show signs of starting to grow they are taken up and carefully packed in moss for shipment. Plenty of moss is used to insure the roots against heating in transit. Many packers make the mistake of having the moss too wet, which is as detrimental to the tree as having it too dry. Trees packed in this condition will start to grow in the boxes, and if properly insulated from outside heat, will carry indefinitely and will be in perfect growing condition on arrival at destination.

Proper Methods of Planting

In planting, set the trees so that when the soil settles the union of the bud with the stock will be at least a couple of inches above the ground. Be

Tree showing strong root development.

sure to settle the soil around the tree with water, whether planting naked-root trees or balled. This should be done as soon after planting as possible, and if the weather is warm it is best to have the water following the planting, so that but a few minutes will intervene between the time of planting and the time when the water reaches it.

If planting naked-root trees, have the water in the holes first, then set the tree and fill in with earth grad-

The four sizes of balled citrus trees.

ually, and spread out the lateral roots with the hands, so that they will be in about the same position as they grew in the nursery. It is often best to use a tank wagon for the first irrigation of naked-root trees.

In filling in the hole around a balled tree, never tramp on top of the ball, as it will break it, dislodge the fibrous roots, and in many instances cause the tree to die. After the hole in which the balled tree is planted is partially filled, cut the cord at the top of the ball and turn down the burlap so that it will be completely buried when the remainder of the hole is filled in. If this is not done, the cultivator teeth, when cultivating, are apt to catch on the burlap and will oftentimes pull the tree out of the ground or disturb it to such an extent that it will die before the trouble is detected. It is not necessary to remove the burlap from the ball; if properly turned down it will soon rot.

After the trees are planted and irrigated and before the earth has become firm around them, they should be carefully gone over and straightened up, as more or less of them will settle to one side or the other, and unless straightened up right away will give the orchard a bad appearance. It will also be found that some of the trees have settled more than others; these should be raised before the earth becomes firm around them.

Newly planted trees should be given a light irrigation every ten days or two weeks until they begin to make some growth. After that it is not necessary to irrigate quite as often. They may be left from three to four weeks, according to the weather.

Never allow young trees to want for water. If they should show signs of being dry, give them a light irrigation right away. After the first year from planting the trees should not be irrigated quite so often. If properly cultivated, one irrigation every month or six weeks is sufficient. In fact, trees will do better if only irrigated once every six weeks, provided the ground is kept thoroughly cultivated between irrigations. The planter should bear in mind the fact that thorough cultivation is just as essential as irrigation. Care should be exercised to prevent the water from standing any length of time around the stem of the tree. In heavy soil this is almost sure to cause gum disease. In addition to cultivation for the purpose of filling in the irrigation furrows, newly planted trees should be carefully hoed after each watering, so as to avoid the possibility of the ground baking or cracking.

The Tree, the Soil, the Care.

Our citrus trees are headed about 26 inches from the ground, hence all that is necessary in planting is to shorten the branches forming the head to eight inches. Trees headed at four feet or more should be cut back to 28 inches for the purpose of forming a new head. High headed trees are always objectionable, for they not only expose much of the stem, causing sunburn, but in addition to this the tree is retarded in acquiring a sturdy, compact growth. Never neglect to protect the stem of young trees. Wrap them with burlap, paper or tules, but the best and most serviceable tree protector is one made from yucca fibre. This allows the free circulation of air around the stem of the tree. The protection of the stem prevents the development of suckers and obviates the danger from sunburn, while the top growth is stimulated.

In order to meet soil and climatic conditions in different sections, we bud our citrus trees on the following stocks: Sweet Orange (Citrus Aurantium Dulcis), Sour Orange (Citrus Aurantium Amara) and Deciduous Orange (Citrus Trifoliata). On the first named sort the budded trees outgrow those on any other root, and practically all the old groves of the state are worked on this stock and are thrifty and healthy, except when situated on soils where there is an excess of moisture during certain seasons. Sweet Orange seedlings are grown from the seed of the common sweet seedling orange. Sour orange seedlings are grown from the seed of the sour orange so extensively grown in Florida as a stock for budding practically all types of citrus fruits. Although the buds do not grow as rapidly or attain as large a size in mature trees, this stock is much more resistant to gum disease, hence it has been in much demand in recent years for heavy soils, where water was apt to stand for any length of time, either because of summer irrigation or a heavy rainfall in the winter months.

There has been an increasing demand for trees budded on sour orange root for planting in the heavier soils on account of the prevalence of gum disease. However, it has been our experience that this is of little benefit on account of the prevailing custom of budding trees within two or four

inches of the ground. As the union of the stocks seems to be the weak part of the tree, where the gum disease usually makes its first appearance, the custom of low budding practically destroys the usefulness of the sour seedling as far as this disease is concerned. For planting on heavy soils, trees should be budded at least six inches

We have trees budded on this root growing in our experimental grounds, and while they are somewhat smaller than those of the same age budded on sweet orange root, this is accounted for by the fact that trees budded on Citrus Trifolia roots are very heavy bearers, and therefore do not make the

Four-year Valencia Late tree and cluster of fruit.

or a foot above the ground. It has been our experience that trees budded on sweet root are much less subject to this disease when budded at this height from the ground.

The Citrus Trifoliata is a native of Japan and is the hardiest orange known. It is deciduous; its fruits are very bitter and of no commercial value, but its hardiness seems to exercise a decided influence on the budded tree. It is said to be more resistent to cold than any other stock. It is also much prized as a hedge plant, making an impenetrable barrier to man and beast. An erroneous impression has often been created in the minds of some people that because it is extensively used as a stock for trees grown in pots and tubs (for which it is particularly adapted), it dwarfs trees when planted in orchard form. Actual tests have proven this to be a mistake

growth that trees with less fruit make. It has been proven that they more than make up, in bearing qualities, what they lack in growth.

We have also experimented with trees budded on this root as to their hardiness and find that they are not only as resistant to gum disease as trees budded on sour root, but that they will stand much more cold than trees budded on either sweet or sour stock. This is on account of their deciduous nature, which causes the tree to become dormant, or nearly so, very early in the fall, and it is a well-known fact that the nearer a citrus tree is to being perfectly dormant the more cold it will stand. We, therefore, use this stock quite extensively for budding on the more tender varieties, such as lemons, limes and pomelos, and find that it makes them almost as hardy as oranges.

A block of two-year-old nursery trees.
A well cared for Navel orange grove.

A young Valenc

Late orange orchard.

Cover crop in young lemon grove.
Picking oranges in midwinter.

Another condition favorable to the use of trees budded on this root is the early ripening of the fruit. Actual tests made by us, on our grounds, have proven it to be a fact that Navels not only color somewhat earlier, but that the fruit is much sweeter and finer flavored than the fruit from trees grown on sweet root, growing in the same block of ground and under similar condition.

Taking all of these points into consideration, we feel safe in recommending the Citrus Trifoliata as a desirable stock to bud on and are sure that planters cannot make a mistake by using trees budded on this stock.

Care of the Orchard.

The old adage that "what is worth doing at all is worth doing well," applies to citrus fruit culture, as well as to all other lines of horticulture and agriculture, and in no other line are the rewards greater.

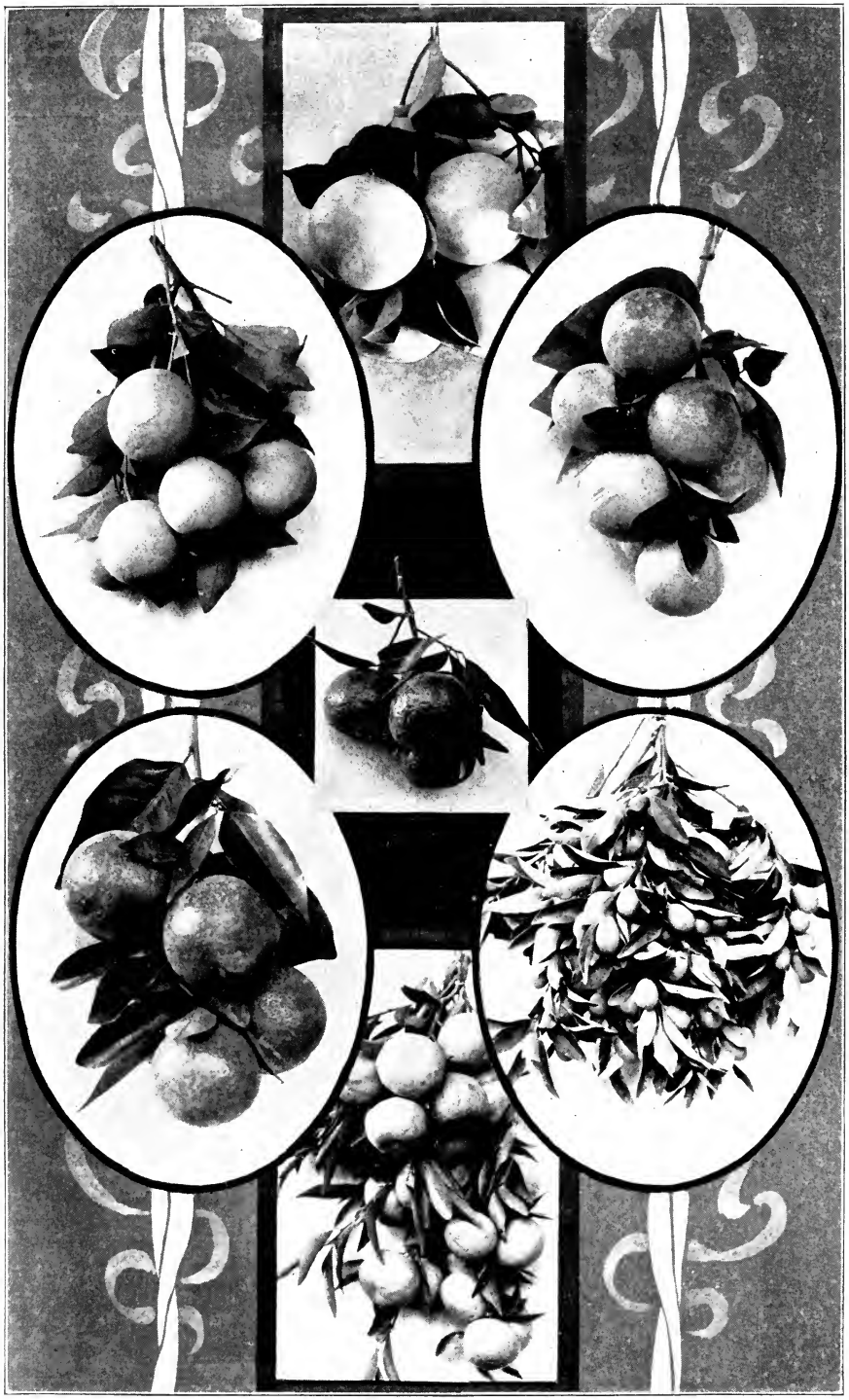
While an orange or lemon tree will stand as much or more abuse than any other tree, yet no other tree will respond more quickly and more profitably to proper care and cultivation. The grower who is careful not to let his orchard want for care or for fertilization, is the one who always reaps a bountiful harvest.

It would be a difficult matter to lay down any hard or fast rule covering the irrigation and cultivation of a citrus orchard, as the soil and the climatic conditions have a great deal to do with the proper time and manner of these two necessary requisites.

Generally speaking, in California, citrus orchards should receive from three to four irrigations during the summer months. These should be given from six to eight weeks apart. By irrigation we mean a thorough wetting; that is, the water should be run long enough to wet up the subsoil as deep and as far out as the roots penetrate. In light, sandy soils the time required to do this is very short, but in the heavier soils it often requires several days to properly saturate the subsoil and the only satisfactory way to irrigate such soils is by the furrow method: that is by running several furrows, according to the age of the orchard, between the rows and allowing very small streams of water to run down each furrow. These streams should be of such size that it will take them from 24 to 48 hours to run across a ten acre tract, which gives the water time to penetrate the subsoil. In some of the heavier soils, if the water is allowed to run through the furrows too fast it will coat over the furrow with a fine silt and it is then almost impossible to get the water to penetrate the soil. The result of this is that the water goes to waste and the trees remain in a dry condition. This condition is only apt to occur on hillside lands, where the fall is quite heavy.

On the lighter sediment lands it is not necessary to let the water run so long, in fact, some of these lands will become sufficiently wet by allowing the water to run only a few hours. Only on extremely level and sandy lands is it advisable to flood citrus orchards and then water should not be allowed to stand around the trees for any length of time. Ordinarily, no irrigation is required during the winter months, although in some seasons it is necessary to irrigate up to December.

The length of time required for the land to dry sufficiently for cultivation after an irrigation depends largely on the nature of the soil and weather conditions. A light, sandy soil will dry enough to cultivate within 24 hours after the water is taken off, but heavier soils require several days of sunshine before they can be properly cultivated. The soil should be dry enough so that it pulverizes or falls apart as it is turned up by the cultivator. If it is inclined to stick together and turn up in solid masses it should be left to dry another day or two. In some of the heavier soils where the drying process is very slow, it is often times best to fill in the furrows with a harrow as soon as the surface shows signs of baking or crusting, then follow with cultivator a day or two later. This prevents the surface getting too dry while that below is getting sufficiently so to cultivate properly thus obviating the soil breaking up in large clods. Outside of the benefit of turning over and aerating the soil, the main benefit of cultivation is the forming of a mulch of finely pulverized soil, which keeps the subsoil from drying out and unless the cultivation is done so as to properly pulverize the top soil a large part of the benefit of cultivation is



Valencia Late
Mediterranean Sweet

Marsh Seedless Pomelo
Dancy Tangerine
Willow Leaf Mandarin

Ruby Blood
Kumquats

lost, as loose, cloddy soil will dry out almost as fast as though uncultivated. The deeper and finer the top soil is stirred the less water the tree will require. We strongly recommend the thorough cultivation of citrus trees to a depth of from 4 to 6 inches where it is possible and that the orchard be cultivated from four to eight times between each irrigation. It is at times impossible to cultivate more than two or four inches deep the first time after an irrigation withou turning up mud, but by setting the cultivator a little deeper each time the ground is gone over, a depth of five or eight inches can be attained in six or seven cultivations. It is not best to do all the cultivating at once as it should be distributed over the interval between the irrigations and in this way helps to conserve the moisture in the subsoil which prevents the tree from suffering.

Fertilizers and Fertilization.

It is best to begin the study of soil fertility early as it is far better to feed the soil before it is exhausted. How best this can be done is a question that has been puzzling our best orchardists for a number of years, and it will, no doubt, continue to do so for years to come as there are so many different soil conditions to contend with that it is impossible to lay down any rule that will apply in all cases.

It is a well known fact that nitrogen, phosphoric acid and potash are the three chemicals required in the soil to produce and sustain plant life, and chemists have figured out just how much of each of these are required for the different plants and trees, and how much the different crops will take from the soil, yet, when it comes to analyzing the soil it will be found that most of the soil contains a sufficient amount of all these ingredients to produce crops, and yet the tree may show that something is lacking. This is accounted for by the fact that any analysis of the soil will show what it contains, but does not tell whether the plant food is available, and unless it is in such form that the roots can feed upon it, it is useless and other plant food will have to be furnished. For this reason, the question of fertilization can only be determined bv the growth of the trees; at the same time it is not advisable to let the orchard go without any fertilization until it begins to show a starved condition. By applying about the same amount of plant food that the tree takes from the ground each year, it should prevent the soil from becoming exhausted. Then if the tree shows by its growth a lack of certain ingredients, it can be supplied accordingly. It has been our observation that barnyard manure applied in liberal quantities is one of the best fertilizers for the promotion of growth, as it not only supplies considerable plant food but assists in making that already in the ground more available by its action in loosening up the soil.

Cover crops of legumes, such as peas, vetch, fenugreek and burr clover, are also quite generally used and are giving good results. They are sown in the late summer or early fall, and allowed to grow during the fall and winter and are then plowed under in the spring. The value of a cover crop depends largely on the amount of growth it makes and the manner in which it is turned under. To get the best results a legume should be selected that will make a heavy growth and then thoroughly turned under in the spring. No cover crop, fertilizer or manure, is of any particular value on top of the ground. It must be turned under or placed in the ground where the rootlets of the tree can feed upon it.

Commercial fertilizers are used quite extensively and with good results, but on account of the cost, a good many growers do not use enough per tree to get the best results. It is necessary to use some commercial fertilizer in connection with the use of barnyard manure or cover crops in order to supply all the ingredients necessary to properly feed the tree.

The planter should bear in mind that no matter what form of fertilization is used, satisfactory results cannot be obtained unless the soil is properly cultivated as the rootlets of the tree cannot take up the plant food unless the soil is kept in condition so that these feeders can continue undisturbed in quest of it.

The Time to Plant.

Citrus trees being evergreen they can be planted at all seasons of the year, although the months of March,

April, May and June are considered the most favorable. In the interior valleys where it is extremely hot and dry during the summer months, it is advisable to plant as early as possible in the spring, although planting should not commence until the ground is fairly warm so that the tree will immediately start to grow. Trees planted too early, while the ground is still cold and wet, will remain in a dormant condition until the ground gets sufficiently warmed up so that they can make a start. When this condition prevails for any length of time it causes the finer roots to decay; as a consequence of this, when the tree does start, it will make rather a slow growth until new rootlets are formed. For this reason it is advisable to defer planting until conditions are favorable for the tree to start to grow as soon as planted.

Along the coast where the summer climate is more moderate, citrus trees are planted with good results all through the spring and summer months. In fact, the trees planted during June and July seem to make nearly as good a growth as those planted in the spring. Where planting cannot be done before this time, it is our opinion that July or early August planting is preferable to waiting over until the following spring. Even though the trees do not make quite as vigorous a growth as those planted earlier in the season, they make sufficient growth to become thoroughly established, in consequence of which, they are all ready to start with the first touch of spring and are far ahead of any that can be planted after that time.

The only thing necessary to successful summer planting is to see that the trees are properly handled from the nursery to the orchard and are sufficiently well irrigated and cultivated. The prompt application of water to newly planted trees is very essential in late planting.

Bringing the Orchard Into Bearing.

The instructions given under the head of "Growing the Citrus" in a general way covers the culture of the orange, and very little more need be added. Sufficient water and thorough cultivation are the two important items necessary for the first few years. In pruning, above all things do not be deceived into the idea that the trees must be thinned out to admit air and sun. The tendency of nearly all the budded varieties is to droop, so in shaping the tree cut to a lateral which has an upward tendency. For the first four years except to check the growth of rampant and interfering branches for the purpose of securing a well rounded symmetrical head, little or no pruning is necessary. As the tree develops, dead branches and those which are no longer fruit producing should be removed annually. A well pruned orange tree should present a compact mass of foliage with none of the branches exposed to view. If the tree is to develop properly it is essential that all water sprouts and suckers be kept down.

The orange begins to bear fruit the second or third year, but not in sufficient quantities to be of commercial importance although we have known

A well-shaped Eureka lemon tree.

of well-cared for Navel orchards producing a half box to the tree the third year. It is best, however, not to allow young trees to bear too heavily as it retards growth thereby reducing the bearing area of the tree in following years. Allow the tree to devote its first years to producing wood rather than fruit, thus increasing its bearing capacity in later years.

GROWING AND PACKING THE ORANGE

The grower with five or ten acres of oranges usually does not consider it necessary to pack his crop, but intrusts it to the shipper or association handling fruit in his locality; nevertheless, if the growers would give packing more attention it would tend to improve the fruit.

Method of furrowing for flooding.

It has been a practice of the small grower to deliver fruit to the packing house without noticing its condition and quality, whether above or below the average of his locality. Only when the returns come in does he realize that had the quality and size been better more satisfactory returns might have been realized. It must be borne in mind that consumers are human beings like ourselves, and that unless the quality is such that it appeals to them, they are going to pass it up in much the same manner as we do when we go into a store to purchase fruit or vegetables for our own use.

If the grower will begin studying packing and marketing conditions, noting the size and quality of fruit demanded, methods of properly handling and packing from orchard to loaded car, it will often not only assist to correct bad conditions in the orchard for the production of the best grades of fruit, but it will be a guide in determining what shipper to intrust with your crop, for the shipper who maintains the highest and most uniform grade of packing is bound to get the most satisfactory returns for the grower. It is necessary, first of all, to keep the orchard in such condition by proper methods of irrigating and cultivating that it will produce only the best quality of fruit. Size and quality cannot always be governed by cultural methods, for it often happens that climatic conditions cause the fruit to be small one season and large another, in spite of the care exercised. Taken one year with another, however, it pays to give intensive culture.

In picking and handling the fruit care is essential, as the carrying quality of the fruit depends largely on the manner in which it is handled from the orchard to the car. The practice of having fruit picked by day labor gives better results. It costs a little more to harvest a crop this way, but the results are much more satisfactory as the loss from bruising is less, which more than offsets the additional cost.

Care must be exercised in picking to use clippers that do not cut or injure the fruit. The stems must be cut

close, as one orange with a long stem may puncture or bruise a dozen or more while passing from the picking bags to the boxes, and from there to the packing house.

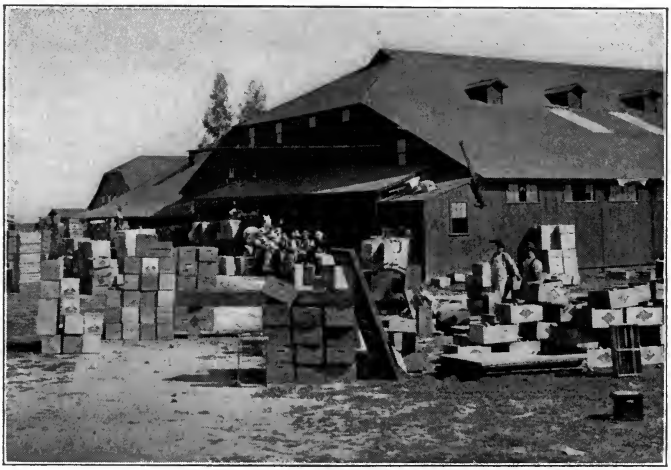
It was estimated that from 85 to 90% of the heavy decay in California oranges, a few years ago, was directly due to the methods of picking and handling the fruit in the orchards, so that it is to the interest of the orchardist to personally see that the pickers are careful in cutting the fruit from the trees and placing them in the boxes. The picking bags used for this purpose are open at the bottom, and if the picker is careful, the fruit can be let out of these into the boxes without allowing it to drop or bump against other fruit in the box. Care must also be exercised in filling the boxes so that when stacked in the wagon on top of each other, the boxes will not be so full that the fruit will get bruised or smashed. All wagons for hauling the fruit should be equipped with springs so as to reduce the jar and jolting to a minimum.

The modern equipment in packing houses is calculated to reduce to a minimum the chances of bruising the fruit while passing from the receiving door to the car, and the old-time graders and elevators whereby the fruit was subjected to drops of from six to eight inches have been consigned to the scrap heap.

Furrow system of irrigation.

To those who have never seen an orange packing house in operation, a description of the methods employed therein will, no doubt, be of some interest. The fruit after being taken in at the receiving door is trucked to the grader, then dumped into a hopper and carried by a belt conveyer to the brushes; these are so arranged that as it passes through, every particle of dust is brushed off. When the fruit is very dirty it is sometimes necessary to first pass it through washers where the smut and dirt is washed off by brushes operating in water; it must then be thoroughly dried before going back to the grader. If the washing is not necessary, the fruit passes from brushes to the sorting table and is there selected as to quality. The regular grades are fancy, choice, standards and culls, although some packers put up an extra fancy and an extra choice brand. As the fruit is sorted, it is conveyed to the different graders. In large houses a grader is used for each brand, which are so arranged that the fruit passes over roller adjusted so that the different sizes fall through into bins arranged on either side of the grader, and from which the packers take the fruit and pack it into boxes. Where only one grader is used and one brand of fruit runs at a time, the remaining fruit is taken from the sorting table before it reaches the grader and sent back to be run over the grader later on. In the larger houses where several graders are in operation at the same time, each grade of fruit is passed from the sorting tables to a belt conveyor carrying it to the grader handling that grade of fruit; this does away with the necessity of passing any of the fruit over the sorting table a second time. In sorting the fruit, only such

as is considered perfect, that is free from blemishes, sound in quality, and fairly smooth, is sorted out for the fancy or extra fancy grade. The next best goes to the choice grade, and consists of such fruit as may be only slightly blemished and possibly not quite so smooth as the fancy grade, but otherwise sound and of good quality; that which is quite badly scarred and with a rough skin, but of sound and good keeping quality, is packed as standard; and all fruit showing an unsound skin, either from being bruised in picking or handling, which tends to impair its keeping qualities, is thrown out as culls.



Exterior citrus fruit packing house.

The standard box used for packing oranges is divided into two compartments of the following dimensions: 11½x11½x11½ inches and the sizes into which the oranges are graded are: 64s, 80s, 96s, 112s, 126s, 150s, 176s, 200s, 216s, 250s, and 324s, and the bins are so arranged that each size is graded into a separate receptacle. After being packed the boxes are carried to the press where the tops are nailed on; they are then ready to be loaded into the cars.

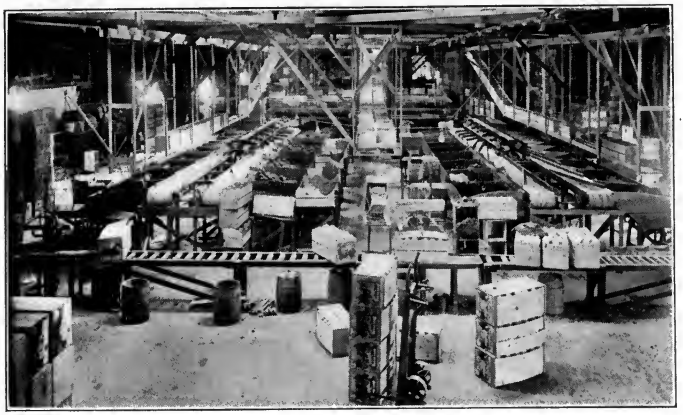
Packing lemons from the curing trays.

A standard carload of oranges consists of 384 packed boxes of the following sizes: Not more than 38 boxes of 96s or 112s, 76 boxes of 126s and 38 boxes of 216s or 250s. The remainder of the car to be made up of 150s, 176s and 200s. All larger or smaller sizes, and any in excess of the above numbers of 96s, 112s, 126s, 216s and 250s are considered off sizes and are discounted from 25 to 50 per box according to the market; 150s, 176s and 200s are standard, and a car may be made up entirely of these sizes without discount although most markets demand a certain amount of large and small fruit and packers usually try to load in accordance with the demand of the market to which they are shipping, as the buyer will always pay more for a car that suits his trade than for one in which there are undesirable sizes.

VARIETIES OF ORANGES.

THE STANDARDS

Joppa. Introduced from Joppa, Palestine. Fruit large and of red orange color, nearly seedless; thin rind; pulp very fine, sweet and juicy; tree thornless, upright grower. Its remarkable characteristic is that it can be left on the tree as late as July and still retain all the features of a first-class shipper. April to July.



Interior citrus fruit packing house.

King. Introduced from Siam. Fruit very large; very rough rind, which adheres loosely like all Mandarin types; fruit much flattened, color orange red; pulp juicy, meaty with a peculiar attractive aromatic flavor of the very best quality. Tree upright, vigorous grower and quite thorny with rich, dark foliage. June to August.

Kumquat. A small species much cultivated in China and Japan and known there as Kin-Kan, which means gold orange. Kumquat is Chinese for the same meaning. The fruit is about the size of a very large gooseberry, but decidedly more oval in form; rind sweet; juice acid, very delicious and refreshing. The sweet rind and the agreeable acid pulp make a piquant combination relished by most palates. Preserved in sugar by the Chinese and largely used as a sweetmeat. Tree of dwarf habit and very desirable for pot and garden culture, being both profitable and ornamental. May to July.

Mediterranean Sweet. Fruit medium to large; pulp solid and few seeds; ripens late. Tree is thornless and very productive; very widely distributed and popular. February.

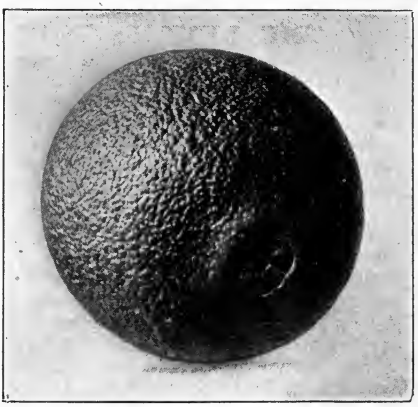
Ruby Blood. Fruit medium, nearly round, skin very smooth and thin; pulp rich, juicy and melting. When the fruit is ripe, it is streaked and mottled throughout with blood red so intensely that at times it penetrates through the skin; much superior to the Maltese Blood. Tree a strong vigorous grower and thornless; a regular and heavy bearer. January to April.

Satsuma. (Unshiu, Oonshiu). Introduced from Japan. Tree of dwarfish habit, quite thornless and bears when very young. The first orange to ripen its fruit. Very hardy, which in connection with its earliness makes it an invaluable sort. Skin thin, deep yellow; flesh very tender, juicy, sweet, delicious, entirely seedless. October to December.

St. Michael. Small, round, firm, thin skin, pulp juicy and very sweet; tree dwarfish habit; a good bearer; very desirable variety. February.

Tangerine. (Dancy's.) Fruit of medium size, of the Mandarin type. The pulp is very sweet; rind thin and separating readily. March.

Thomson's Improved Navel. Originated by A. C. Thompson, of Duarte. Fruit of medium size, rind very smooth and thin; pulp juicy, sweet and of firm texture. Its earliness, combined with the smoothness and the thin-skinned rind, have given this variety in many localities a precedence over the Washington Navel. November to January.



Washington Navel Orange.

Washington Navel. Of all foreign varieties introduced, none have given California the prominence and prestige as a great citrus section that this remarkable variety has. It de-

rives its name from the peculiar umbilical formation on the summit or blossom end of the fruit. In California it has reached its highest stage of perfection, and stands in the lead of all other varieties for its large size, lusciousness and sweetness of pulp, so that it well deserves the title of "King of Oranges." Tree is a rapid grower and an early and prolific cropper. Fruit juicy, melting, seedless. November to March.

Valencia Late. Fruit oblong, large, resembles Paper Rind St. Michael in color and firmness; ripens very late, reaching the market when all other varieties are gone. A valuable variety and only second to the Washington Navel in the extent of its dissemination. In localities not subject to late frosts it should be extensively planted. Will hold its fruit in good condition as late as September.

Willow-Leaved Mandarin. Tree a very compact grower, and desirable for ornament. Fruit medium size, flattened, deep yellow; skin thin; segments loosely adherent; flesh dark orange yellow, spicy and aromatic. December to February.

NEW VARIETIES

Golden Nugget Navel. Introduced by R. M. Teague of San Dimas, California. Tree a vigorous grower of good habit, thornless; foliage dark green, abundant lateral or fruiting branches, and very symmetrical; easily distinguished in a grove of other varieties. The tree presents a rather umbrageous appearance due to the slender willowy growth of the younger branches. The fruit is of a deep golden color, very smooth, solid and thin skinned, the exterior being strongly suggestive of kid gloves to the touch so smooth and even is the surface; shape rather oblong, good size; pulp is deliciously sweet, free from rag and is seedless. November to March.

Navelencia. This new sort is commanding some attention from growers. Said to be a cross between the Thomson's Improved Navel and the Valencia Late, it possesses all the good qualities of its parents, and ripens fully 60 days later than the Washington Navel, thus extending the season for marketing Navels until the early summer months. In character of growth and in the fine texture of the fruit it is said to resemble other Navels; it is seedless. Worthy of trial. April to June.

Cluster of Washington Navel Oranges.

THE LEMON: GROWING, CURING, PACKING.

The lemon will not stand as low a temperature as the orange, hence its planting for commercial purposes is restricted to localities where the temperature during the winter months does not go lower than 24 degrees Fahrenheit above zero. The tree is a strong upright grower and the branches must be held in check by systematic annual pruning, which causes a liberal development of lateral branches and keeps the tree in a low symmetrical form, thus facilitating the gathering of the crop. Fruit should be picked as soon as it has attained its size and just before turning. For home use, each fruit should be wrapped and placed in a box in a cool place. After a few months the lemon will have become quite yellow in color with thin skin and will be full of juice. Lemons allowed to ripen on the tree are thick skinned, deficient in juice, develop extreme bitterness and are in every way inferior. For commercial purposes lemons are cured before shipping in specially designed houses.

In localities where the conditions are congenial for its perfect development, flowers, immature and mature fruit ready to pick will be found on the same tree. A few trees are always a desirable addition to the wants of every home, and by taking precaution to plant in a protected spot, a good supply of fruit is always available. The tree is a very prolific bearer. Any soil in which the orange thrives is well adapted to the lemon.

The lemon requires more vigorous pruning than the orange and in order to get the best results, the tree should be pruned from the first year after

planting. The nature of the tree is to make a strong, upright growth the fruit has a tendency to grow on the ends of this growth. The checking of this heavy growth by pruning, causes the development of numerous lateral

Cluster of Eureka Lemons.

fruit bearing branches. The fruit is set close in and there is no danger of its becoming scarred and whipped around, as it would be on long, spindling branches extending out far beyond the confines of the trees.

To overcome this, all long branches should be cut back and thinned out, leaving only such branches on the young trees as will form a symmetrical head. All strong, upright growth that comes from these branches should also be cut back so as to cause the tree to have more of a spreading nature. Care should also be taken to prevent the tree from becoming too dense; to produce good fruit a lemon tree should be open so as to admit plenty of sunlight and air.

Systematic pruning of the lemon not only brings the tree closer to the ground, thus materially reducing the cost of picking, but tends to cause the tree to be more prolific and also produce a better quality of fruit.

The preparation of the lemon for market is quite different from that of the orange. To secure best results in quality and keeping properties the lemon should be carefully cut from the tree as soon as it is of the proper size. Fruit left on the tree to color is generally deficient in juice, a very poor keeper and often times develops bitterness.

In picking lemons, rings are used by the pickers to prevent the picking of undersized fruit. For winter picking 2 5-16 inch rings are used and for spring and summer picking 2½ inch rings.

To obtain best results, both as to size and keeping quality, the orchard should be picked over every four or six weeks. Right here is where the grower cannot be too careful, as a large part of the success or failure of the lemon business is due to the methods of picking and handling of the fruit. It should be borne in mind that every little bruise or bump effects the keeping quality of the fruit. When lemons are to be kept from three to six months before going on to the market, they should be handled as carefully as eggs.

Properly cured lemons may be kept for months and they will improve in market qualities, by a thinning and toughening of the skin and by an increase of juice content.

The process of curing lemons is a very simple one, yet a very particular undertaking. After experimenting for a number of years in the southern part of the state, the "open air" plan has been found to be the best method of curing the fruit. The lemon houses are built with only a floor and a roof, leaving off all sides for a free circulation of air. The fruit is stacked in blocks, of several hundred boxes or trays of fruit in a block and each block is covered with a canvas tent made for the purpose, and so arranged that the tent can be raised or lowered to control the ventilation.

Great care should be exercised in this respect as by improper ventilation the fruit will sweat and commence to decay from too little air or become badly wilted from an over supply. The desired condition to be attained in curing is to bring out the proper color, reduce the thickness of the skin and increase the quantity of juice and at the same time keep the

fruit in as firm a condition as possible. To do this the temperature and ventilation must be regulated so as to avoid sweating too rapidly and at the same time not to let in enough hot air to cause the fruit to shrivel.

The methods of handling and curing lemons have been greatly improved during the last few years. As a result of careful handling of the fruit from the tree to the packing-house the loss by decay has been reduced to a minimum. The use of trays for curing instead of the ordinary field and picking boxes also helps to reduce the loss by decay, as these trays are made just deep enough to hold one layer of fruit. This not only prevents the bruising of the fruit but facilitates the sorting of it. These trays can be stacked as high as necessary in the curing house without crowding or bruising the fruit.

During the summer months the lemons are only kept in the curing house long enough to properly color them and then they are taken out and packed for shipment. From two to four weeks in the curing house is necessary for proper coloring, depending on the condition of the fruit when picked. There is very little need for sorting the fruit during this time, as before the fruit is placed on the trays it is passed through the brushes so as to remove any dirt or smut that may be on it. These brushes are arranged in vats containing water in which is a solution of one per cent bluestone to destroy any fungus or spores of blue mold that might be present and which always causes heavy decay if allowed to get established in the curing rooms. After passing through the brushes the fruit is carefully taken from the water and sorted as to ripeness and placed in the trays, the yellow or tree ripe fruit going into one stack, the partly colored fruit into another and the grass green fruit into a third; each lot going to a separate curing room, and notation made as to time of picking and condition of ripeness. The yellow or tree-ripe fruit only stays in the curing room long enough to slightly reduce the thickness of the skin which also makes it more pliable and less liable to bruise in packing.

The partially colored or pale yellow fruit and the grass green fruit is left in the curing rooms until it takes on the perfect lemon yellow, when it is also in condition to pack.

During the winter and spring months when there is usually a very light demand for lemons the fruit is kept in the curing rooms much longer and usually requires sorting several times. If one fruit starts to decay it will affect all the fruit around it. In a short time all the fruit in the same tray would decay.

Lemons are graded as follows: Extra fancy, fancy, extra choice, choice and standard.

Sorting as to Quality.

After the fruit comes from the curing rooms it is again sorted as to quality. The perfect appearing fruit, that is all the fruits that are smooth, and show no scars or blemishes, are sorted out and packed as extra fancy or fancy, as the case may be. The next grade is almost perfect, fairly smooth and shows no bad scars or blemishes and is packed as choice or extra choice. All fruit showing up perfect as to keeping qualities but deficient as to appearance, having a rough skin or badly scarred and off color is packed as standards.

The standard lemon packs are 210s, 240s, 270s, 300s, 360s, 420s, and 490s. In other words, there are that number of lemons to the box according to the size. The standard lemon box is 10½x14x27 inches outside measurement, divided into two compartments, and all lemons, excepting the very small fruits, are packed in what is called the 3-2 pack. Owing to the shape of a lemon it is impossible to grade them by machinery so all the grading is done by hand. The fruit is dumped into bins, each packer having a separate bin or section of a bin to work from and selects the fruit to size. That is, if he is packing 250s he sorts out all of this size or sufficient for a box and then starts on another size, and so on, a helper keeping the bins supplied with fruit. The packing is usually done by the box, however, a good many shippers are having their packing done by day labor, due to the necessity of careful handling. This is not always possible where each packer is endeavoring to increase his or her wages by trying to pack a few additional boxes.

In all of the operations from picking the lemon to the loading of the packed boxes in the car, care must be used to prevent bruising the fruit. While this rule applies to the handling

of all citrus fruits it will be seen that it is more imperative with lemons on account of the time that intervenes between picking and selling the fruit. After the fruit goes to the consumer it is not used immediately. Therefore if the keeping quality is poor the consumer will look for another brand when buying again.

THE STANDARDS.

Eureka. A California seedling and the recognized commercial variety in this State. Tree a vigorous grower, practically thornless and a prolific bearer. Fruit medium size, sweet, smooth, glossy rind, an excellent keeper, abundant acid and very little rag. Its great popularity in the lemon sections is due to its continuous blooming and setting of lemons all the year, and particularly for its heavy summer crop, when lemons are in greatest demand. The most extensively planted lemon in Southern California.

Lisbon. Imported from Portugal. Medium size; sweet rind and very strong acid, few seeds, an excellent keeper; fruit very uniform; tree a strong grower, with compact foliage, a prolific bearer; quite thorny, but the thorns decrease as the tree grows older. Quite hardy and very popular in the interior. Considered to be the best lemon produced, but on account of its only maturing one crop a year (and that in the fall and winter), it is not favored by many planters. We especially recommend it for planting in the interior, as it produces a heavy fall crop of lemons that size up early enough to reach market at a time of year when prices are good.

Villa Franca. A fine variety and desirable for commercial planting. Fruit oblong; rind thin, without any trace of bitterness; pulp acid, juicy, nearly seedless; tree thornless, spreading habit; will stand a lower temperature than any other variety. Considered by some planters to be preferable to either the Eureka or Lisbon, and is being quite extensively planted in some sections.

THE LIME, THE CITRON AND THE POMELO.

THE LIME

Valuable for its citric acid, which is extensively used in the concoction of summer drinks, and especially palatable as a lemonade. The juice is also used in medicine and in the arts. Its export from the West Indies constitutes an important article of commerce, great quantities being exported to Europe and the United States. Fancy limes, and especially the newer seedless sorts, command good prices in the leading markets of the Western States, the average being from $4 to $6 per box. The tree is more tender than the orange, hence should be planted only in the sheltered foothill regions of the state. Commercial orchards should be planted twenty feet apart. It likes a moist soil, and in California a lime grove should be liberally irrigated.

THE STANDARDS.

Bearss Seedless. Fruit large, more than twice the size of the Mexican and seedless, very juicy, with pronounced acidity. Quite hardy, enormously productive, fruits mature all the year around. Pronounced by experts to be one of the best in cultivation.

Mexican. Very largely grown in California and equal to the imported Mexican. Is much used for hedges, for which purpose it is well adapted.

Tahiti. A strong grower; fruit much larger than the former, but coarse and of inferior quality.

THE CITRON

The tree is even more tender than the lemon, and should therefore be planted where there is very little danger from damage by frost. The fruit is prepared for use by immersing in a brine for several months and after washing it is placed in a hot syrup, remaining for three weeks. Later it is cooked with crystalized sugar dissolved in water, being cooked and cooled alternately until it has taken in sufficient sugar, when it is ready for market.

Citron of Commerce. Fruit large, weighing from three to five pounds; shaped like a lemon; skin bright yellow, smooth and very glossy. The tree is of a dwarf habit, with large, glossy leaves and very ornamental.

THE POMELO

Known as Grape Fruit, because much resembling in appearance a bunch of grapes; fruit borne in immense clusters from three to fifteen fruit in a bunch, hence the name. Fruit much sought after for its medicinal qualities, especially by people suffering from dyspepsia and other stomach troubles. As a healthy breakfast relish it excels every other fruit. As its valuable properties are becoming appreciated the demand for it is increasing. Fruit round, somewhat larger than a Washington Navel, of a pure lemon color, with white flesh of a

delightful aromatic-acid flavor. In the better varieties the pulp is almost wholly free from seeds and "rag." The Pomelo commands good prices in the eastern markets, the supply at present being insufficient to meet the demand. Trees hardy as the orange and should be handled in the same manner, except that being a more thrifty grower trees should never be set closer than 24 feet.

The tree being a prolific bearer, it should be well fed in order to produce large and well flavored fruit, otherwise the fruit will be small, dry, woody and poorly flavored. When the trees are heavily loaded it will be found best to thin out the fruit so that the remainder will properly develop. In the case of a full bearing Pomelo orchard, it is essential to irrigate oftener than with oranges, and especially when the fruit begins to mature.

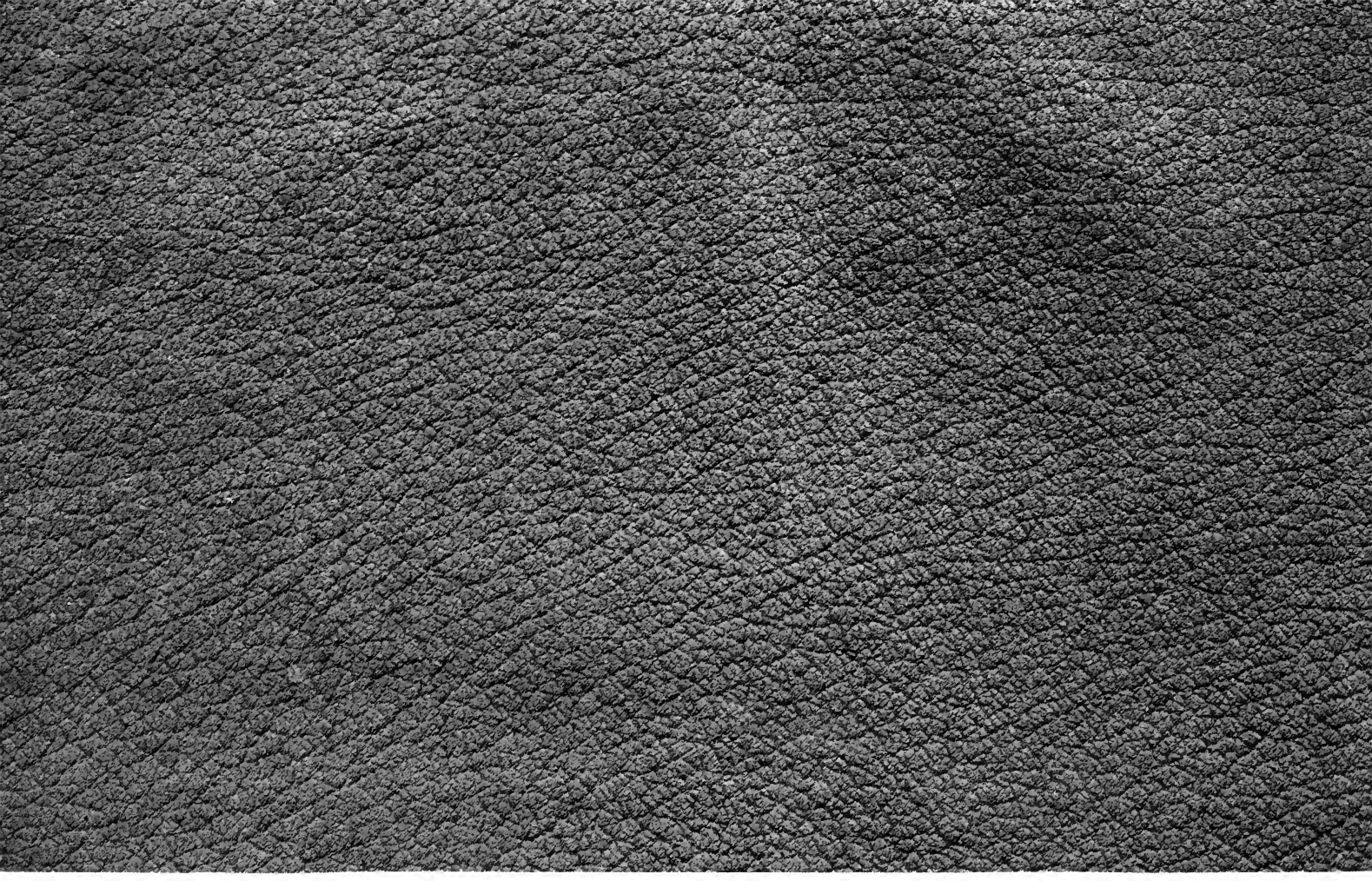
Unlike the orange or lemon, the large size Pomelo is most in demand and there is little sale for the smaller fruit. The sizes meeting with the most ready sale are 48s, 64s and 80s. They are packed in the standard orange box and in much the same manner, excepting that the grading for size is usually done by hand much the same as with lemons. Only the larger markets demand straight cars of Pomelos. Lots of from 25 to 50 boxes in mixed cars of oranges and lemons realize the best prices.

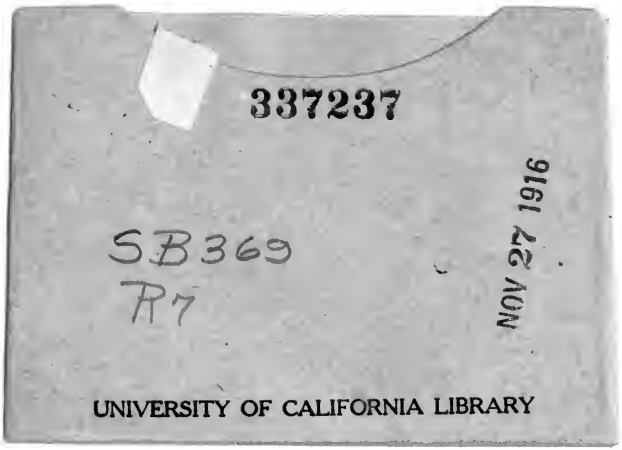
THE STANDARDS

Marsh's Seedless. This Pomelo is deserving of more attention than it has been receiving. It has so many points in its favor over other varieties that it stands in the same relation to the ordinary Pomelos that the Washington Navel oranges do to the general run of oranges. Size medium, skin very smooth, glossy lemon yellow color, pulp juicy with very little rag. With the absence of seeds, or nearly so, one of the principal objections to serving Pomelos is removed. The fruit will hang on the trees until late in September, retaining all of its juices and piquant, aromatic flavor, without any sign of deterioration. This is largely due to its having no seeds which would germinate if kept until late in the season. Of all the citrus family, no tree is so showy as the Pomelo, with its immense clusters of yellow globes set off with a background of deep dark green foliage. Can be eaten out of the hand with relish wtihout the addition of sugar late in the season.

Triumph. Medium size; peel smooth, clear, thin and fine grained; less "rag" than in most Pomelos and fewer seeds; very heavy, juicy and well flavored. No bitter in the juice, flesh nor membrane surrounding the cells and dividing the segments, and very little in the white inner lining of the peel. Tree bears young; one of the best of the imported varieties.

Marsh Seedless Pomelo.

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