

*the*  
California **Citrograph**

A Monthly Publication Devoted to the Interests of the Citrus Industry

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Vol. 31, No. 12, OCTOBER, 1946

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# California Citrograph

VOL. 31, No. 12 OCTOBER, 1946

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### Empty Your Rocking Chair

MANY a rocking chair citizen among us stews about international affairs, cusses the Russians, the British, the Yugoslavs, U. S. statesmen, foreign diplomats—anyone in international news who happens to be on top of the brawl for the moment. Oh sure, we should take an interest in world affairs. The record shows that we have had our heads in the sand for too long. But in the remoteness of world affairs ordinary citizens like you and me don't cut much figure except in our sum total of 140 millions. Some of us, including many men returned from the armed services, look at our little part in the scheme of things as futile, as of no consequence.

In our talks with many people we have found none who will not agree that the greatest need of the country today is better leadership—better leadership on every level, national, state, county, city, town. We have many able men in government, but also many who should be back home again in the insurance business or whatever—but out of politics.

Our nation was organized around the cherished ideal that the government is the servant of the people, established by them for their benefit, and not, as our commies and pinkos are working like gophers to achieve, all-powerful government with the people a voiceless flock of sheep. Our government springs from the people. It is as bad or as good as we will it to be. What it shall be is up to us—thus far, at least.

Each of us can take active part in local affairs wherever they touch us. We can see to it that we have a competent school board, an effective city or town council, county supervisors that work honestly at their jobs, and so on. Many an organization, civic and otherwise, could do well with new and better talent—people to run our affairs with competence and honesty. Bringing this about is our most important job. It is something we can DO. Democracy is planned to work from the ground up, not from the top down.

There's an election soon. Study the issues. Study the candidates. Enemies of American ideals and principles are busy. Sound-thinking Americans should also be busy working to bring into leadership men of stature and competence who will lead us safely through these difficult times.

Express your convictions, choose your leadership with your ballot. That means VOTE. And see to it that your neighbors get out of their rocking chairs and vote too. Nothing can knock us down but our own complacency.

### Makes Sense

THE consolidation of two citrus packing houses in the Azusa section, announced elsewhere in this issue, strikes us as good horse sense. It should bring about important economies, and put those growers concerned in better position to weather any business slumps that may come along. The Law of Gravity, y'know. All that goes up comes down, and sometimes with a bump.

Now is a mighty good time to give some serious thought to ways and means of bringing about economies, cushioning the bump. An efficiently operated house is in a much better position to ride out any economic storm that may come than the one in need of a general overhauling. The processing, packaging and shipping of fruit from grove to consumer is costly. Certainly there are some parts of the process in which economies can be worked out.

If one takes the total citrus pack and divides it by the number of packing houses in operation the figure for the average packing house is surprisingly small. If the shipping volume of a packing house is below the mean, there is a good chance that it may not be operating with the desired efficiency. Possibly a consolidation might be worked out to take advantage of the economies to be had in larger volume of operations. The matter deserves careful study and cooperative thought.

### Working Citizen

THIS is in tribute to a modest man, Stone Virene, whose life was much to the benefit of San Bernardino County. He had acquired no great wealth or influence but lived a full life, and made generous use of his time and talents.

At the time of his death, in addition to his modest citrus orchard and poultry work, he was serving in the vexatious position as manager of the Farm Labor Office of San Bernardino County. He was doing his best to aid other farmers to find help to harvest their crops. He was a past president of the County Farm Bureau and a State Delegate, chairman of a local pest control association, and active in various local affairs.

As World War I broke, Michigan-born Stone Virene joined the Canadian Army. Grievous injuries in combat led to a seven-year siege in military hospitals. With a lung impairment, never in the best of health, he lived an exemplary life. He found more useful things to do than most men, endowed with perfect health. Most of his energy was expended for the public good. Urged many times in recent years to slow down, Stone never seemed to find the time to do it. A heart attack took him and we have lost a fine working citizen.

If only one per cent of our people would work as hard at the job of being a useful citizen as had Stone Virene, many of our present domestic problems would soon be the backwash of history. Vaya con Dios.

### Selling Job

IN appraising the future of the free enterprise system let us not forget that it is endangered also by the confusion of its defenders compared with the vigor, the alertness and determination of that group who would destroy it," said Rep. Everett Dirksen of Illinois recently in an address before the American Plant Food Council. "There is a remedy. The future of free enterprise will be determined by the vigor with which its virtues and opportunities are reasserted.

"Freedom like merchandise must be sold and resold over and over again in every generation. Somewhere along the line there must be a four-squared determination whether the free enterprise system and the free market as we have known it for more than 150 years is worth fighting for, and if so to fight for it and for its preservation with a crusading zeal which we have never known before.

"Surely a nation which spends more than a billion dollars annually in advertising merchandise and building good will can well afford . . . to create a general staff for freedom and to resell the principles of freedom into the hearts and minds of the people. This is one of the imperatives of this generation."

### Help Wanted

DAY after day the daily papers carry "Help Wanted" advertisements measured by column yards. This seems to be pretty solid evidence that there is a drastic shortage of manpower needed to do a potentially vast amount of useful work.

Thousands continue to draw unemployment insurance. There are allegations of lax administration, and asserted malingering and small-time racketeering. At any rate this situation is costing California taxpayers a million dollars a day, and even in this heyday that's not hay.

Looks as if there will be plenty of work cut out for the Legislature come January, which cannot come soon enough. We hope our legislators are sufficiently concerned to be collecting facts and figures.

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# Citrus in Sikkim

By W. B. HAYES

The following short but highly interesting article on the citrus industry of the State of Sikkim, in northern India, was written by W. B. Hayes, Professor of Horticulture and Assistant Principal, Allahabad Institute, Allahabad, India.

Professor Hayes recently had the rare good fortune to be invited to this exceedingly little known and rarely visited country to make a survey of its citrus industry. According to Professor Robert W. Hodgson, Assistant Dean of the College of Agriculture, University of California, this report is the most authoritative that has been prepared, and Hayes' recent book, "Fruit Growing in India" is the best and most up-to-date treatise prepared on this subject. Professor Hayes is a southern Californian, raised in Pasadena, educated at Oregon State College, with advanced work at U.C.L.A. He has been a member of the staff of the famous Allahabad Institute for many years, and a visitor here on several occasions.

To most Americans, Sikkim is probably entirely unknown or thought of as an out-of-the-way place, associated with mountain climbing or with mysterious, forbidden Tibet. That idea is not entirely unjustified, for while it is easily reached in eighteen hours from Calcutta, second city of

the British Empire, it is off the main routes of travel, and can be entered only with a special permit. The state is entirely mountainous, and just within its borders lies Kinchenjunga, whose peak is more than 28,000 feet above sea level. And through Sikkim pass important trade routes over high passes into Tibet. Even to us in India, Sikkim seems little known, and somewhat different from other Indian states as well as from British India. It was therefore with the more pleasure that an invitation from the Durbar to study the citrus industry of the State was accepted.

Sikkim is a small state, with about three-fourths the area of Los Angeles county and lies between the independent countries of Nepal, Tibet, and Bhutan, and British India. The total population of about 120,000 is made up of Bhutias, whose ancestors came from Tibet several hundred years ago, Nepalis who have come in more recent times, and several small groups such as the Lepchas, who have "always" been there. Practically all are shepherds or farmers with small terraced fields of rice, other grains,

vegetables, and in some cases, citrus fruits. In the north a few apples are grown.

The citrus fruits are almost all mandarins, and like most of this type grown in India, they are sweet, juicy, and tender, but without the pleasant tang of the tangerine. They are generally recognized by foreigners as well as Indians as fruits of excellent quality. The Sikkim mandarin has a rind that is thin, but not as loose as that of many mandarins, and so it stands shipping better. When ripe it is of an attractive bright orange color. Visitors to Calcutta during the winter probably eat these mandarins without knowing their origin, for they are known there as Darjeeling oranges, and are an important part of the city's supply.

The Sikkim mandarins are grown on rather steep hillsides, most at elevations between 2,000 and 4,500 feet. Orchards which are said to have flourished lower than this have practically disappeared, and new plantings there have failed. The reason for this failure is obscure. It is certainly not the temperature, for sweet oranges

and grapefruit have also failed. Most of the orchards, including the best, are terraced. The soil is heavier than is ordinarily preferred for citrus fruits, but this may be an advantage since irrigation is very seldom practiced. Fields which can be irrigated are reserved for rice. Rainfall varies from about 80 to 120 inches, and the temperatures are mild, but there is a fairly long dry season during which irrigation would doubtless be an advantage. Lack of sufficient heat seems to be a limiting factor at the higher elevations, but frost is apparently no danger.

The trees grown are almost entirely seedlings, and the quality of the fruit varies somewhat. The seedlings are slow-growing, and are seldom planted out before they are four years old. The preference seems to be for a tall nursery tree, and some were seen in a nursery which were 9 or 10 years old, up to 12 feet tall, and bearing fruit. Yet it was expected that these trees would be transplanted. Some were seen almost as tall which had been transplanted a few months before. They were yellow, but it was hoped that they would live. The fact that seedlings are used, that they are kept crowded in the nursery for so long, and that no attempt is made to shape the trees by pruning, explains the slender form of the trees in all but the oldest orchards.

# Revolving Funds

By GEORGE E. and KNOX FARRAND

Although we are attorneys for a number of cooperative associations, the views herein expressed are our own, and do not necessarily reflect the views of any of our clients, who have neither approved nor disapproved of this statement.

**THE TERM "Revolving Fund"** as applied to farmer cooperative associations has no technical or precise definition. This uncertainty makes for confusion of thought in any discussion of the problem. The revolving fund idea as used in the citrus and walnut industries is as old as the associations themselves. No one person initiated the plan. Though we have had much to do with drawing revolving fund agreements and with what should be included in the plans, and though we originated and drew the Fruit Growers Supply Company Revolving Fund plan later discussed, we are not the author of the idea.

The simplest form of the plan is where growers in a community form a local cooperative association under applicable statutes. The group acquires a site and plans a "house" with required equipment. The total cost may run from fifty thousand dollars to several hundred thousand dollars. If wise, the local group will be sure of having a signed up acreage with firm commitments to underwrite the borrowings of their association. Many locals borrow all of the money for land, buildings, and equipment. That shows the strength of the grower group in the community. As we see

little or no education, and communications are poor.

Two insect pests present outstanding problems. Fruit flies are only sporadic pests, if present at all, in most parts of India, but they cause great damage each year in Sikkim, and are apparently increasing. It is very common for about one tenth of the fruits to be lying on the ground as a result of infestation, and in some orchards the damage is well above 50 per cent. Very little effort is made to control the flies, although some of the more progressive growers gather the fallen fruit and bury it, a measure of questionable value. The fly has not yet been identified. Stem borers of the species *Monochamus versteegi* and a similar unidentified species constitute the second major problem. As many as ten of these were taken from the trunk of one tree about six inches in diameter, and many trees are similarly attacked. As the borers feed mainly on the bark, at night, the severity of the damage is obvious. A commonly used method of control is interesting, but the value is questioned by some growers. This is to drive hard bamboo pegs into the holes made by the borers. It is not uncommon to see six or ten such pegs sticking out of the trunk of a tree.

it, the more money paid in by the growers in the beginning and the greater the underwriting by the growers from the start, the safer is the financial future of the association. The questions of whether the association should or should not have capital stock, and as to the amount of capital to be paid in or provided for at the outset, are outside the scope of this discussion.

The revolving fund plan in its simplest form provides that the growers will contribute to the fund at specified times so much per box, per acre, per sack, per crate, per cow, or other unit. These contributions are placed in a fund called the "Revolving Fund." The fund may be used for capital purposes, such as purchase of land, buildings, and equipment, or to repay debts incurred for such purposes; and it may also be used to provide working capital. The fund is not supposed to be used to pay the expenses of the association. When enough contributions have been made so that no more are required for capital purposes, the contributions do not cease, but the growers continue to make payments into the fund, which is then used by the association to repay to those growers who first contributed money to the fund. A list of these contributors is kept by the association, showing the name of the grower, date, and amount of contribution. This is often called the "priority list." As payments are made after adequate capital is provided, those at the top of the priority list receive their money, and the fund is then said to "revolve."

There are many refinements of the plan. The one discussed is the simple case of a cash revolving fund. Sometimes, as in the case of the Supply Company plan, the stock itself revolves, that is, the ownership is currently readjusted among the local associations which are parties to the agreement, in accordance with their shipments of fruit through the Exchange. It is thought that such shipments are a proper basis for making the readjustments. A local which is a large shipper will require more packing house and orchard supplies than a small shipper, and it is logical that the former own more Supply Company capital stock than the latter. The stock is on a non-dividend basis. This Supply Company plan may be discussed in a later article.

The plan of the cash revolving fund is in effect a borrowing by the association from its grower members by means of amounts taken from the proceeds of the product marketed by the association. Even in a simple plan there are obviously many points to consider. Some of the plans become quite a chore of legal and financial draftsmanship. Among the things to be considered are: shall the amount of the contribution be fixed, or shall the amount be made flexible, to be raised, lowered, or suspended as de-

termined by the board of directors of the association so as to take note of changed conditions in the industry? Should there be flexibility in the use of the fund? For example, should the board be given authority to say that within predetermined limits the contributions made to the fund shall be used either to provide new capital or to revolve existing capital, or part to each? As the contributions might be considered borrowings and thus later the plan prove an obstacle to direct financing by the local, should the plan itself show that repayment to the growers is subordinate to the past, present, and future borrowings of association whether secured or unsecured, and other obligations of the association? Note that if the grower buys stock in a capital stock association (and many associations are formed with capital stock), the law itself provides that no stockholder is entitled to anything until after all of the debts of the association are paid; thus an automatic and complete subordination takes place. The contributors to a cash revolving fund should be in no better position than are the purchasers of stock in a capital association.

It is interesting to note that many revolving funds which were established without much consideration of the above problems, have worked with surprising satisfaction to all concerned.

Due regard to possible future conditions in which the industry may find itself with more financial and selling problems, compels the conclusion that more attention should be paid to the financial and legal safety of the plan than is given generally to the subject.

In an article as brief as this, obviously no attention can be given to income tax or other legal implications of the agreement, nor to the application to the plan of state and federal laws concerning the issuance of securities.

## The Farm Land Gamble

**"TOO MANY** city folks are risking their future on high farm prices and are going into debt to buy a farm," states A. G. Salter, Farm Advisor of San Bernardino County. He states many inquiries are reaching him.

The postwar period of World War II is taking the same trend as World War I. High postwar farm income is tempting too many people, both farm and city folks, to buy farms at inflated prices. Many of these buyers will have to pay off the mortgage on declining prices, he says.

The signposts are already showing that what happened after World War I no doubt will happen after World War II. When prices reach the top there is only one direction in which they can travel. The \$64 question now is: When will (or when did) prices reach the peak? At this moment our crystal ball is not in working order. At any rate, now is a good time to get out of debt.



Citrus Views in Northern India

1. Shanti Kutir, residence of Rai Sahib Ratan Bahadur Pradlian, Chandra Nursery, Rhenock. 2. Grapefruit orchard, Turuk, with pineapples and gladioli as intercrops. Punnya Pasad, Pradlian and Sons. 3. Orange market, Rangpo. 4. Coolies carrying oranges to market along Teesta River, above Singtam.

5. Suntala tree, 11 years old, with good crop in top, Nangitlian. 6. Suntala (Sikkim mandarin) tree about 50 years old, with much fruit, mostly green, P. P. Pradlian, Turuk. 7. Nursery of trees which are to be transplanted, below Terni. Photos by W. B. Hayes.

A Progress Report by the Division of Soils and Plant Nutrition, University of California Citrus Experiment Station

# Soil and Nutritional Studies in Relation to Quick Decline of Oranges

Quick Decline Symptomology as Related to Nutritional Deficiency Symptoms

## Introduction

### Part I

OUR work on the nutritional aspects of Quick Decline has had three objectives: (1) To determine whether or not Quick Decline might be due to some nutritional deficiency or excess; (2) To determine whether nitrite or any other soil-produced toxin might be involved; and (3) To find out whether any single or combined fertilizer or soil amendment treatment would alter the course of the disease.

A good description of Quick Decline has been given by Fawcett and his co-workers (2). For the convenience of the reader this description in part is repeated here: "The appearance of a tree with Quick Decline is very similar to that of trees whose roots have been injured or killed by girdling due to gophers, gummosis, oak root fungus, or damaged directly by waterlogging, high concentrations of fertilizers, by kerosene or other materials." "Quick Decline in the above ground part of the tree is manifested at first by a yellowish green or dull ashen color of the foliage and frequently by a large crop of fruit and if the fruit is about to mature, by a premature coloring of the oranges. New growth in the fall is sparse. Later the leaves begin to curl upward along the midvein and drop off and some twigs die back. A majority of the affected trees develop a chronic form of disease during which they may put out considerable new growth on the bare branches and maintain themselves in a low state of health and productivity for several years. This has been referred to as an equilibrium stage. If cut back severely before the top symptoms are advanced, much new growth appears. In a small percentage of trees a sudden collapse and drying of the foliage occur before much leaf drop and the trees die. The roots die back progressively from the tops toward the trunk, the beginning of root destruction often preceding the appearance of symptoms in the top."

The only thing we would add to this description is the appearance under certain conditions of leaves with typical vein chlorosis. This symptom is mentioned because Camp (1) has reported it as commonly seen on Tristeza affected trees in South America. It developed on many of our experimental trees in the Covina area under the following conditions: In the fall of 1945 a considerable number of the declining navel orange trees put out considerable growth. The new foliage was at first green and healthy. Later the leaves began to fade some and typical vein chlorosis appeared in many. This vein chlorosis condition has not only been prominent on these trees but has persisted now for about 10 months.



Fig. 1 (top)—Growth of sour orange seedlings in differentially fertilized soil from quick decline orchard (surface soil).

Fig. 2 (middle)—Growth of sour orange seedlings in differentially fertilized soil from quick decline orchard (gravelly-sandy subsoil).

Fig. 3 (bottom)—Growth of sour orange seedlings in differentially fertilized nondecline soil.

## Deficiency Symptoms

### Part II

Perhaps the most consistent and characteristic condition associated with Quick Decline of oranges is root rotting. The top symptoms, all the way from the first appearance of dull colored foliage to final collapse, are referable in greater or lesser degree to root rotting. In searching for a possible nutritional explanation of Quick Decline, we have naturally given considerable thought to this point. In our experience with citrus nutrition thus far, and so far as we can learn from the experience of others, the most common nutritional cause of root rotting is oxygen deficiency. Under field conditions, the chief cause of oxygen deficiency is excessive soil moisture. The soils on which decline is most prevalent and the circumstances under which it occurs however do not lend much support to the hypothesis that lack of oxygen or excess soil moisture is the cause of the root rotting seen in Quick Decline though it must be admitted that we know very little about the oxygen requirement of citrus and the factors affecting it.

The only other nutrient deficiency leading to severe root rotting with which we have had experience is calcium deficiency. However, not all of our experimentally produced calcium-deficient trees showed root rotting, so this is not an invariable symptom or condition accompanying deficiency of this element. As will be clear from the data to follow, there is no evidence to date that Quick Decline is caused by lack of calcium. In the case of all other nutrient deficiencies with which we have had experience, root rotting has not been noted.

In the field nitrogen, zinc, manganese, copper, iron, magnesium, and boron deficiencies have been seen under many conditions and the characteristic symptoms observed. Root rotting is not a distinguishing feature of any of these nor are the growth or foliage symptoms similar to decline. In the case of sulfur, phosphorus, and potassium deficiencies, no cases of acute deficiency as occurring in the field have come to the authors attention. However, these deficiencies have been produced under controlled conditions. Root rotting did not occur in the acute stages of these deficiencies and the top symptoms were unlike those which characterize decline.

With regard to nutrient excesses, much less is known but so far as our experience goes there is not much in common between the effects of nutrient excesses and the symptoms of decline.

Owing to the general dissimilarity of Quick Decline symptoms with those which accompany nutrient disorders, it has appeared superficially at least that the basic cause must lie

in some direction. On the other hand much remains to be learned about citrus nutrition, particularly in the field of minor elements and in the interrelation of nutrients to climate and disease. Hence a broad program of research, both basic and practical, has been inaugurated to determine whether nutrition might in any way be involved in this disorder. The following is a progress report on some of the practical phases.—H. D. Chapman.

## Soil, Plant, and Water Analyses

### Part III

Various analyses have been made on the soil, on citrus leaf material, and on the irrigation waters used in the decline area. Analysis of the irrigation water for ordinary salt constituents showed it to be of excellent quality and water extracts of both surface and subsoil in areas where trees had declined showed no evidence of soluble salt accumulation. Leaf analyses of many groves in the decline area for major ash constituents showed slightly subnormal calcium, magnesium, and phosphorus levels but not sufficiently low to place them definitely in the deficiency range. Following this, spectrographic analyses were made on samples of soil, irrigation water, and later leaves from the decline area. These data are shown in Table 1. For comparison, similar data from the Citrus Experiment Station are included.

Insofar as we are able to interpret these results at present there is nothing out of line in the minor element components of the irrigation water and soil of the decline area or are the differences in leaf composition believed to be significant so far as Quick Decline is concerned.

It should be pointed out that the spectrographic method is not sensitive to certain elements and at present nothing can be stated regarding them.—A. P. Vanselow and B. M. Laurance.

## Field Trials

### Part IV

As a further check on the possibility of Quick Decline being due to a nutrient deficiency, and also to determine whether certain treatments

would alter the course of the disease, 24 different soil treatments were accorded to both sick and healthy trees in the decline area. A block of navel orange trees at Covina was made available to us for this purpose. The surface soil to about 12 inches in this orchard is a sand to loamy sand underlain by sand and gravel. There was a total of 247 navel trees on sour stock in this area to start with of which nearly 50 per cent showed some signs of Quick Decline. At the outset, 76 trees were basined and the fertilizer treatments added to these basins. Weeds were controlled with oil and the basins irrigated often enough to assure the presence of adequate soil moisture at all times. The treatments, amounts of fertilizer added, and the number and condition of the trees treated are shown in Table 2. Later on more trees were basined and treated with other materials including various acids and acid salts.

In order to check on the possibility that nitrite might be involved in Quick Decline, soil analyses were made for both nitrate and nitrite at frequent intervals following the addition of certain fertilizer treatments.

At approximately monthly intervals, a tree survey was made to check on any changes in tree condition.

Serving as a general control against this basined and differentially fertilized group of trees was the remainder of the block where fertilization, cultivation, etc., has been as usual.

Rootstock determination tests were made on all of the trees in the block and save for replants and one or two other trees the tests indicated the entire planting to be on sour stock.

Starch tests on small diameter roots were made several times on all trees in the block. pH determinations have also been made on all of the basined trees from time to time to check the effects of treatment on soil reaction.

Results of Field Trials—It will be noted from Table 2 that the 24 soil treatments were given to both healthy and declined trees. While only a limited number of trees were used per treatment, many of the nutrients added alone such as phosphate, potash, calcium, magnesium, and sulfate were repeated in combination with other fertilizers so that if the difficulty turned out to be a simple deficiency,

(Continued on Page 470)

TABLE 1. Spectrographic Analyses of Irrigation Water, Soil and Foliage from Decline and Nondecline Area

Element	Irrigation water		Soil		Navel Orange Leaves	
	Citrus Exp. Station	Griffith Ranch	Citrus Exp. Station	Griffith Ranch	Citrus Exp. Station	Griffith Ranch
Silver	.0005	.0002	0.50†	0.70	0.2	0.3
Aluminum	.012	.012	M.C.	M.C.	37.0	40.0
Boron	.10	.01	200.	100.0	45.0	70.0
Barium	.015	.050	400.	350.0	60.0	140.0
Beryllium	N.D.*	N.D.	N.D.	N.D.	N.D.	N.D.
Cobalt	N.D.	.0005	4.0	8.0	N.D.	N.D.
Chromium	.004	.0002	25.0	30.0	0.2	0.3
Copper	.008	.007	25.0	50.0	9.5	9.5
Iron	.050	.050	M.C.	M.C.	75.0	190.0
Gallium	N.D.	N.D.	30.0	25.0	N.D.	N.D.
Manganese	.001	.001	1000.0	500.0	18.0	30.0
Molybdenum	.01	.002	6.0	1.5	N.D.	0.6
Nickel	N.D.	.0007	8.0	20.0	N.D.	0.6
Lead	.002	.002	20.0	30.0	1.0	3.0
Tin	N.D.	.002	10.0	5.0	N.D.	1.5
Strontium	.12	.15	200.0	120.0	100.	80.0
Titanium	N.D.	.002	2000.0	3500.	5.	1.5
Vanadium	.10	.002	70.	150.	N.D.	1.5
Zinc	N.D.	.07	200.	100.	25.	150.
Zirconium	N.D.	N.D.	500.0	500.	N.D.	N.D.
Lithium	.01	N.D.	N.D.	N.D.	N.D.	N.D.

\*N.D. means not detected.  
†M.C. means major component.

# ANNUAL THERMOMETER TESTING

By ROY J. ROGERS

Mr. Rogers is Meteorologist of the Fruit Frost Service, U. S. Weather Bureau, located at Pomona, California

### Growers Can Help

EACH YEAR, during the month of October, personnel of the U. S. Weather Bureau Fruit-Frost Service test and service thousands of fruit growers' thermometers, thermometers that are later used in connection with orchard heating operations. As usual, these thermometers are collected at the various packing house associations and then brought to a central location where the testing and servicing work is done.

The basic accuracy of the better types of thermometers seldom changes, but defects such as separations in the fluid column, condensation of the fluid in the overflow bulb, and other adjustable defects do occur. All too frequently some of these defects are not readily detected when just glancing at a thermometer and only by an accurate test would they be detected.

After thermometers have been tested for accuracy they are re-examined to see that thermometer graduations are plainly visible, because no matter how accurate a thermometer may be it is of no value unless it can be accurately read. If the graduations (thermometer scale) have worn off or become indistinct then the scale is rebalanced making it again readable.

Much heater fuel has been burned unnecessarily because of some defect in a thermometer, so it is a good idea, and sound business practice, to have them checked before the beginning of each frost season; especially as this work is done without charge.

### Testing Dates

All thermometers in Ventura and Santa Barbara Counties will be tested and serviced at the office of the County Agricultural Commissioner at Santa Paula on October 8th. Growers in those counties who wish to have their thermometers tested this season should bring them to their local packing association in plenty of time for delivery to Santa Paula before that date.

Thermometers in all other districts (excluding the Imperial Valley, San Diego County, the San Joaquin and Sacramento Valley districts) will be checked at Pomona starting October 14. Thermometers should be brought to the grower's packing house prior to October 14; the packing house manager will arrange for the transportation of the instruments to and from Pomona.

Thermometers in the Imperial Valley, San Diego County, the San Joaquin and Sacramento Valley districts will be checked after arrival of a fruit-frost representative in those respective districts.

Approximately 20,000 thermometers, from many different packing associations, are tested annually by the Weather Bureau Fruit-Frost Service. That is a lot of thermometers to be handled in the testing and servicing operations. Cooperation of the growers and packing house managers will do much to expedite this work and also assist materially in helping to keep the instruments from being misplaced. Some of the things the growers and packing house managers can do to help are:

(1) Thermometers should be removed from individual thermometer boxes, from bundles or paper wrappings.

(2) See that a tag is securely attached to each thermometer, to the end opposite the thermometer bulb. Each thermometer is tested separately, so a bundle of 6 or 8 thermometers with only one tag attached would not only delay the work, but some of the non-tagged instruments might become misplaced.

(3) Fasten tag to each thermometer by means of stout string. Do not have string too long as this may result in tags and strings becoming entangled in testing tanks and tag is then likely to be torn off.

(4) See that the grower's name and the name of the packing house association is clearly marked on each tag. Tested thermometers are returned to the association marked on the tag. Do not use writing ink for marking tags as this may blur or wash off in the testing tank. A soft pencil, or stamp, is suitable for marking.

(5) Use special tag that is furnished by the Fruit-Frost Service to each packing association. (Some associations have their own special tag for this purpose; these are acceptable.) Use new tag annually; they are supplied without cost.

(6) Assembled thermometers, for transportation from packing house to place where testing work is done, should be placed in a strong box that is lined with paper or other material so that thermometers will not protrude through any crack in box. Do not use cardboard cartons as they are likely to become wet and then fall apart. Field boxes, bearing the name of the packing association, are very good for transporting thermometers. The same box, or boxes, will be returned to each association when the tested thermometers are returned.

ODT says the current shortage of boxcars will get worse, reaching a crisis in October, anticipating a shortage of upwards of 50,000 boxcars a week. Railroads are now loading more cars than at any time during the war.

Of all sad words in sound or ink, The saddest are: "I didn't think."

This is one of several talks given in a panel discussion at the recent meeting of the American Institute of Cooperation, held at Lafayette, Indiana. Mr. Armstrong is general manager of the California Fruit Growers Exchange.

## Broadening Farm Markets by Integrated Merchandising and Advertising

By PAUL S. ARMSTRONG

THE purpose of advertising is to bring the people to the product and the purpose of merchandising is to bring the product to the people. It is hard to say which is the more important, but each works best in combination with the other.

The products of agriculture are the subject of a great deal of advertising and also of merchandising effort. As a rule these activities are not carried on by the producer but rather by the processor, the manufacturer or the distributor. Some products, which are marketed to the consumer in their natural state, or on which the producer does the processing can be and are advertised by the producers, usually through their own cooperative organization. The individual farmer is powerless to advertise on an effective scale, as it takes a large organization to engage in advertising and merchandising on an economical basis.

Since this subject can best be discussed by citing specific examples, it seems advisable to use my own organization, the California Fruit Growers Exchange. First, because I am familiar with its activities and, second, because the Exchange has a long history of advertising and merchandising experience; longer I believe than that of any other cooperation.

The advertising of a natural product like the orange was somewhat of an adventure and at the time the advertising was started in 1907, there were many who felt that the orange was already a well-known fruit which did not require advertising to bring it to public attention. They regarded the initial advertising appropriation of \$7,000 in that year as an unnecessary extravagance.

There has always been a basic demand for citrus fruits, as there is for any good product, but during the season of 1907-08 the Exchange organization was faced with the problem of successfully marketing a very large crop for that time, totaling 17,500 cars of citrus fruit. At that time the Exchange was handling about 55 per cent of the total California citrus crop. Exchange directors realized that they had two jobs to do. First, they knew that production was constantly increasing and that something must be done to increase consumer demand for their products; second, with only about one-half of the crop in the cooperative they recognized that they must demonstrate a superior ability to market the crop, if they expected to get a greater percentage of membership.

The first test campaign conducted in Iowa in 1907 produced encouraging results and the Exchange has conducted an advertising program without interruption since that date. Methods have changed but the objectives have not. They are, first, to increase the consumer demand for cit-

rus fruit and, second, to increase the preference for citrus fruit produced in California; especially that produced by Exchange members and marketed under the Sunkist brand. In 1945 the Exchange marketed over 100,000 carloads of citrus fruit and its membership was comprised of 75 per cent of the citrus growers of California and Arizona. The advertising investment in 1945 was approximately two and a half million and the aggregate investment has been approximately forty million dollars over the 40-year period. The cost of advertising an industry is necessarily large, but has been shared by many people. Through cooperation the cost to the individual grower is quite small. At the present time the advertising investment is 7¢ per packed box for oranges and last year the combined costs of selling and advertising on Exchange oranges represented 1½ per cent of the consumer's dollar.

Citrus fruit is sold through approximately 4,000 wholesalers and 500,000 retail outlets. Some years ago it became apparent that great opportunities lay in the direction of improving merchandising practices in the handling of fruit. In 1915, following an investigation of retail pricing and display practices, the Exchange entered upon a program of dealer service, which has continued ever since. At that time it was unique. Attractive, appealing displays are of prime importance in selling citrus fruit.

Exchange merchandising men approached the 1915 retailer with several important sales facts. First, they showed him what the Exchange was doing to interest the consumer in citrus fruits. Second, they showed him that the addition of citrus fruits to his store would be a profitable and customer-attracting business. Third, they demonstrated to the retailer the effectiveness of properly arranged citrus displays and supplied him with display material to make his citrus display even more attractive. Fourth, they showed him how to handle citrus fruits to avoid spoilage and gain increased profit. Fifth, they instructed the retailer how to properly price citrus fruit to maintain the highest volume sale and still obtain satisfactory margin of profit on the product.

The pricing of citrus fruit by the retail dealer has an interesting side light. At the time the Exchange began its merchandising work, no one was just sure what the mark-up should be on citrus fruit so the Exchange asked the Harvard School of Business Research to study the matter. The result was a recommended margin of profit on citrus fruit which would show the retailer a good profit on his investment and, at the same time,

offer the consumer a good value for his money. It is interesting to note that the margin of profit—25 per cent on the selling price—is still recommended by Exchange dealer service men and, until a wartime economy disrupted many regular mark-up practices, was closely followed by most retailers throughout the United States and Canada.

Exchange dealer service men now work hand-in-hand with Exchange advertising programs. Their major activity is to demonstrate to wholesale and retail dealers the advantages of handling a volume of Exchange citrus fruit. They still demonstrate practical methods of display. Today their work is augmented by motion pictures, printed educational material for the wholesale and retail dealers, and a wide variety of display pieces for retail store use. Exchange dealer service men this year will contact approximately 100,000 retailers and install 50,000 displays of citrus fruit. They will make several hundred showings of an educational motion picture, describing in detail the proper handling of all fresh fruits and vegetables. Printed material, advising wholesalers and retailers of current crop news, new merchandising stocks, current advertising campaigns, etc., is mailed monthly to a large list of dealers throughout the United States and Canada.

The fundamentals of our merchandising or sales promotion are threefold—buying, displaying and pricing. While they have never changed, the service has been broadened. In 1930 we had gained enough experience in citrus merchandising presentation and methods to present a standardized plan of promotion for the use of group retailers, both corporate and independent. This was preceded by display tests which were repeated for individual groups before they were asked to launch regional or national promotions. This plan was well received and helped to form a new concept of citrus merchandising opportunities and techniques.

We have long recognized that the success of citrus fruit retailing is bound up with efficient operation of the fruit and vegetable department as a whole. In the middle '30s we accordingly broadened our merchandising service program to incorporate constructive assistance in the improvement of fruit and vegetable departments of retail stores. From various sources we obtained fundamental information and trained our men in the best methods of preparing, displaying and pricing all perishables. This was augmented with blueprints on fruit stand construction and location in the store. As the program was developed it was incorporated in motion picture films which permitted us to reach more dealers under the

most desirable conditions. As an example of the service we have rendered on fruits and vegetables other than citrus, we issued the Buyer's Guide and Spoilage Chart. The Buyer's Guide was originally developed for the restaurant trade to provide them with information on seasons of production, the basis of determining quality and fundamental information on packs, including sizes and weights. The companion Spoilage chart was designed to provide authentic information on proper handling and storing. Shortly after the introduction of these pieces, the war came. This material was offered to the Procurement Officers of the military forces in camps and hospitals. Thousands of these pieces, as you see them here, have thus gone into effective use and we hope have contributed importantly to food conservation through more efficient utilization.

Today we are interested in pre-packaging and are doing some work in our laboratories as well as cooperating with retailers engaged in this work. There is no phase of fruit and vegetable merchandising in which we are not vitally interested and actively cooperating with the trade.

I have given a brief resume of our merchandising service and activities, which is not apart from advertising but a division of it, just as home economics, publicity and nutrition research. In the latter we have invested hundreds of thousands of dollars in grants of money to research institutions to advance the knowledge of the nutritive values of citrus. As this information is developed, our consumer advertising relates it to the public. The orange per capita has increased, largely as a result of these combined efforts, from 35 in 1907 to 125 in 1946. The war has given great impetus to consumption of citrus fruits, yet a large segment of the population still consumes too few. The Vitamin C intake of the nation is still but one-half of what it should be, and citrus fruits are the richest source of this vitamin.

There are other examples of merchandising which could be given, such as the development of the electric fruit juice extractor in 1918. Prior to that time there had been no efficient means of getting the juice from oranges. With the advent of Prohibition, soda fountains came into greater prominence. Here was a potential outlet. Since 1918 one hundred thousand electric fruit juice extractors have been sold to soda fountains and restaurants and today it is estimated that this outlet, which did not exist appreciably before 1918, accounts for the consumption of twenty-five thousand carloads of oranges annually, and it is still growing. The home model electric juice extractor was introduced in 1928 and has sold in hundreds of thousands. Prior to the introduction of the commercial machine for soda fountains and restaurants we became interested in glass reamers. Millions of these have been sold, carrying the Sunkist trade-

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# The Sunkist Courier

DEPARTMENT

The success of cooperation lies not so much in cooperation itself as in the individual

COMPILED MONTHLY IN THE OFFICES OF THE CALIFORNIA FRUIT GROWERS EXCHANGE

## MARKET ON PRODUCE STIRS SHIPPERS AND JOBBERS

Bottleneck in Distribution Shown by Trade Paper Survey

The present condition of practically the entire fresh fruit and vegetable market is cause for considerable concern among both shippers and wholesalers. Authoritative representatives of both groups have pointed to the fact that prices on the entire fresh fruit and vegetable line are largely depressed but that the lower prices have not resulted in a greater sales volume.

Publication Survey

The Packer, leading trade paper of the wholesale-shipper group, in its September 6 issue, reports on a survey conducted in several terminal markets to determine whether or not pricing at the retail level was retarding distribution of fresh produce. Representatives of the publication interviewed both wholesale and retail dealers in an attempt to get the answer to this very puzzling question.

The Packer concluded that, while the investigation did not justify any sweeping conclusions, "it is apparent that retail prices are unjustifiably high in a sufficient number of cases to have some adverse effect on distribution of crops in abundant supply."

Exchange Men at Work

Exchange Dealer Service men are working diligently with retail dealers to encourage proper pricing and maximum merchandising effort on citrus fruits. They are demonstrating to the retail trade the value of a real sales promotion program. This activity, long a fundamental rule of Exchange Dealer Service work, has been instrumental in maintaining a high volume of sale on Exchange fruit at a satisfactory profit margin for the retail and wholesale dealer.

Follows Planned Economy

There is a general feeling among producers and wholesalers that any tendency to over-price in the retail stores will result in the planned economy during the war years. Several authorities have pointed out that ceiling prices have been in effect so long that consumers are accustomed to paying ceiling and regard that as the "right price." Consumers, they say, don't question prices as long as they are close to the ceiling price that once prevailed on fresh fruits and vegetables.



UNRRA Photo  
These Czech youngsters in a Prague hospital gain strength by eating California lemons. A total of more than 1300 cases of lemons were distributed by UNRRA to hospitalized children throughout Czechoslovakia. The fruit is especially used for tubercular children.

## AUGUST LEMON MARKET WEAK WITH POOR WEATHER; SEPTEMBER SHOWS PRICE GAIN

Exchange packed lemon sales for the period November 1 to September 7 totaled 15,215 cars compared with 15,678 cars sold during a comparable period last year and, despite the poor market of the past six weeks, the f.o.b. average price for the current season is only 33¢ per box lower than 1944-45.

The August lemon market was weak and demand below average but the situation took a turn for the better early in September when weather

became more favorable and supplies lighter.

Industry Utilization

For the season to date, total industry utilization shows 20,420 cars shipped fresh and 12,430 cars going to products for a total movement of 32,850 cars. Last year, utilization for a similar period amounted to 27,400 cars of which 21,110 moved in fresh form.

During the month of August, the California lemon industry shipped 3080 cars in all channels compared with 2800 cars moved a year ago. Exchange packed sales for August totaled 1556 cars, 200 cars less than 1945.

Picks Light

An estimated 780 cars of lemons were picked in September compared with 880 cars actually picked last year. August picks were also below those of 1945, only 970 cars compared with 1320 a year ago.

(Continued on Page 466)

## ORANGE MARKET FIRM DESPITE STRONG COMPETITION

Shipping Schedule Shows Crop Clean-up by Early November

The orange market was generally steady during August, larger sizes selling at ceiling but discounts prevailed on the smaller fruit. Utilization to September 7 showed a total movement through all channels of 39,130 cars. An estimated 13,370 cars still remained for harvest and indications were that the Valencia season would practically wind up the first of November.

Products demand was strong and diversion to non-fresh channels accounted for 9530 cars to September 7. This compared with 10,130 cars sent to products last year out of a 26,380 total car movement for a similar period.

August Volume Good

Exchange fresh fruit sales during August totaled 5726 standard cars compared with 7210 sold last year during the same month. The f.o.b. average was \$1.33 per box higher this year than last.

Total industry movement in August was 10,950 cars of which 8060 moved fresh and 2890 were sent to products. During the same month last year 9360 cars were shipped fresh and 3620 cars were diverted to non-fresh outlets for a total movement of 12,980 cars.

Competition Continues Heavy

Although deciduous shipments declined in mid-September, the August orange and grapefruit markets encountered stiff competition from soft fruits and melons. A total of 30,130 cars were shipped during August, slightly more than the 28,750 cars of competitive fruit shipped the same month a year ago.

Peaches offered the principal competition with a movement of 7950 cars. Pears, watermelons, cantaloupes and grapes followed in competing for trade and consumer attention with shipments of 4620, 3970, 3570 and 3420 cars, respectively.

Florida Season Starts

Florida's estimated 100 million box 1946-47 citrus crop was expected to start moving to market about the middle of September. Indications were that grapefruit shipments would get underway first, followed by light orange shipments about the first of October with the general movement in full swing by October 15.

(Continued on Page 466)

**COOK'S HELPER WANTED**

THE FOOD	THE PROBLEM	THE ANSWER
FISH	"How can I give it a tender taste?"	Place for real lemon juice in a quarter. To off odor rub fish with before baking.
SALADS	"Why don't my salads taste better?"	Squeeze just juice in your dressing. (Use citrus, and by all means.)
JUICES	"Can't I do something about the tartness of my lemon juice?"	A dash of refreshing lemon juice. Also, a dash of sugar.
DESSERTS	"What can I do to make my lemon dessert more appealing?"	Use Sunkist Lemons in your dessert. They are the finest.
VEGETABLES	"How can I make my vegetables more palatable?"	Use Sunkist Lemons in your vegetable dressing. They are the finest.
TEA	"How can I make my tea more refreshing?"	Use Sunkist Lemons in your tea. They are the finest.
VITAMINS	"How can I get more vitamins from my diet?"	Use Sunkist Lemons. They are the finest.

### How important is a LEMON?

The lemon is the most versatile and one of the most important of all fresh foods. Because the average layman thinks of it only as a recipe ingredient, and a source of vitamin C, several of the other outstanding values of the lemon are often overlooked. It is the nutritionist and biochemist who fully know the importance of this citrus fruit!

- AS A DIURETIC** - Lemon juice aids in water elimination from the body. It has been found to increase the diuretic effects of certain beverages such as tea and coffee.
- AS A REGULATOR** - The juice of a lemon in a glass of water—taken first thing on arising—is an excellent intestinal regulator for most people.
- AS AN ALKALINIZER** - Natural citric acid in lemon juice is metabolized into carbon dioxide and water, and the alkaline mineral salts found in lemons—potassium, calcium, magnesium—are left in the body to act as alkalizers.
- AS A SOURCE OF VITAMINS** - An average of 100 milliliters (3 ozs.) of lemon juice contains: 60 micrograms of thiamin, 150 micrograms of niacin, 45 milligrams of ascorbic acid, and 9 milligrams of "vitamin P".
- AS A FOOD** - The peel, juice, or segments of a lemon can be put to any one of dozens of different culinary uses—with fish, sauces, vegetables, salad dressings; in lemonade, tea, pie, sherbets, puddings.
- AS A NATURAL FLAVOR** - Lemon is one of the three most popular flavors in baking and cooking. It gives a refreshing tartness and a flavor complement to a wide variety of recipes.

Sunkist Lemons in trademarked tissue wrappers are the finest from 14,500 cooperating California-Arizona citrus growers.

**California Sunkist Lemons**

Two examples of lemon advertising currently appearing in widely different publications are shown above. The two color advertisements at the left lists some of the more important lemon food uses in the kitchen. This series showing an unusually high readership, is appearing in women's magazines such as *Woman's Home Companion*, *McCall's*, *Ladies Home Journal* and others. The advertisement on the right is directed to professional groups and is appearing in home economics and dietetic publications.

## FARM CO-OP GROUPS SHOW GOOD GAIN

Business volume and membership of farmers' cooperative associations showed a substantial increase in the 1944-45 marketing season over the previous season, according to compilations of the Farm Credit Administration of the U. S. Department of Agriculture.

Estimated membership in the agricultural cooperatives operating in the year ended June 30, 1945, was 4,505,000, an increase of 230,000. The 4,505,000 membership does not represent that many individual farmers, it is pointed out, as some farmers have membership in more than one cooperative. Business handled by the co-ops went from \$5,160,000,000 to \$5,645,000,000, an increase of \$485 million in the year.

### Dairy Co-ops First

Business of dairy co-ops totaled \$1,294,000,000, ranking first among products handled cooperatively. Associations handling grain and beans were in second place, reaching a dollar volume of \$1,286,000,000. Fruits and vegetables were in third place with \$784 million of products sold during the season. These three major classifications accounted for approximately 69 percent of the total business handled by marketing cooperatives.

Approximately 14 percent of the business of agricultural cooperatives handled during the 1944-45 fiscal year was in the purchasing field, according to the Farm Credit Administration, which is about the same proportion as for the previous 12 months.

### Consolidations Increase

Cooperatives engaged in marketing farm commodities and buying supplies for farmers dropped from 10,300 to 10,150 in number, the decrease being due chiefly to consolidations.

Leading state in agricultural cooperatives is Minnesota, where 1362 associations have a membership of 420,000. Wisconsin is second in number of associations with 1030, but Illinois is second in membership with 411,780.

The railroads report that they have almost 50,000 cars on order. During the first six months of 1946 the carriers scrapped 29,000 cars and only received 18,000 new cars from manufacturers, leaving a net shortage of 11,000 cars. While theoretical production is estimated at 16,000 cars per month, actual production this year has been only 3000 per month. Steel is the current shortage, with labor an ever-present production problem.

gon and Washington farmers reported a storage of 3 million bushels of wheat in the Pacific Northwest alone.

### Turnaround Time Important

A contributing factor to the car shortage is the fact that turnaround time is longer than it was before the war. In mid-July, the railroads reported a turnaround time of about 12.5 days compared with 12 days during the 1941 peak movement. The half day difference in time is equal to 50,000 freight cars.

The carriers point to observance of the 5-day week by shippers and receivers as a slowing factor in turnaround time.

Railroads are urging faster unloading and turnaround time in the effort to keep a maximum of cars in service but there are only two things that will really solve the problem; a sharp decrease in traffic or a sharp increase in new car stock. Neither is likely in the immediate future.

consecutive weeks in 1920 there was a shortage of more than 100,000 cars weekly with a peak shortage of 179,200 during one week.

At the present time there does not seem to be any comparable shortage in sight. Traffic authorities estimate that this year's peak demand will be for one million cars weekly. The railroads can sustain between 920,000 and 950,000 cars per week in service which indicates a maximum shortage of 80,000 cars during the peak weeks.

### Grain Hard Hit

Hardest hit have been grain and industrial shipments, Neill reported. All available box cars have been diverted to the grain areas which has created a shortage in the industrial east and hasn't been sufficient to handle the heavy volume of grain. Ore-

### Worst in 25 Years

The rail car shortage has the dubious distinction of being the most severe since 1920 but is not expected to be as bad, Neill stated. For twelve

## FERTILIZER SUPPLY REPORTED BY U. S. D. A.

The U. S. Department of Agriculture recently announced the quantities of fertilizer materials which are expected to be available to farmers of the United States, including Puerto Rico and Hawaii, during the 1946-47 fertilizer year. These quantities are in line with recommendations recently made by the Combined Food Board (now replaced by the International Emergency Food Council), which were designed to result in as equitable a division as possible of available supplies.

### Severe World Shortage

In spite of increased production of fertilizer materials in many countries, the world shortage is so severe that the problem of obtaining a fair distribution has been even more difficult than during the war years. Estimated world requirements for nitrogen exceed world supplies by nearly 1,000,000 tons, or approximately 25 per cent. Estimated requirements exceed supplies by 16 per cent in the case of phosphate rock and by 32 per cent in the case of soluble phosphates. For potash, approximate balance can be achieved between world requirements and supplies only if exports from Germany reach prewar levels.

The U. S. production of fertilizer materials is expected to be maintained at the peak war level, with perhaps some increase. On a plant food basis this is nearly double the average annual quantity used during the period 1935-39. Supplies available for consumption, taking imports and exports into account, are expected at least to equal the record quantities used during the year ending June 30, 1946.

### Nitrogen Tight

Domestic production of nitrogen will total about 577,000 tons. Imports are expected to total 201,000 tons, mostly from Canada and Chile, and a small quantity is scheduled to come from Norway. Exports of nitrogen are expected to total about 97,000 tons.

The over-all supply of nitrogen for agricultural use in the United States and possessions during 1946-47 is 681,000 tons, which is approximately the same as was available during the past year. This is nearly twice the average consumption in 1935-39.

The 97,000 tons of nitrogen for export include Canada, 550 tons; Latin American Republics, 5500 tons; France and colonies, 19,600 tons; Finland, 2200 tons; Netherlands, 22,500 tons; Netherlands East Indies, 2200 tons; Philippines, 3000 tons; and UNRRA countries, 41,360 tons.

Thus far, imports actually scheduled from Chile cover only the period July-December 1946, and amount to



## Southern Division Sales Force At Annual Meeting

Exchange district sales managers and brokers in the Southern Division attended the annual meeting in Kansas City early in September. Reading clockwise seated: G. A. Johnson, New Orleans; Jerome Reilly, San Antonio; T. A. Thomas, Atlanta; C. S. Myers, Oklahoma City; R. Z. Eller, Advertising Manager; R. B. Wallace, Orange Sales Manager; R. H. James, Division Manager; P. S. Armstrong, General Manager; L. H. Wohlwend, General Sales Manager; W. D. Baker, Houston; J. O. Whalen, Dealer Service; E. W. Carlson, Assistant, Kansas City; D. L. Southwick, Tulsa; L. E. Mathison, Wichita. Standing L to R: T. J. Scott, Dallas; G. A. Arendt, Little Rock; J. W. Litton, Memphis; C. R. Garrison, Dealer Service; Ken Thurston, Foote, Cone & Belding; R. B. Dameron, Assistant, Kansas City; and Joseph Reilly, San Antonio.

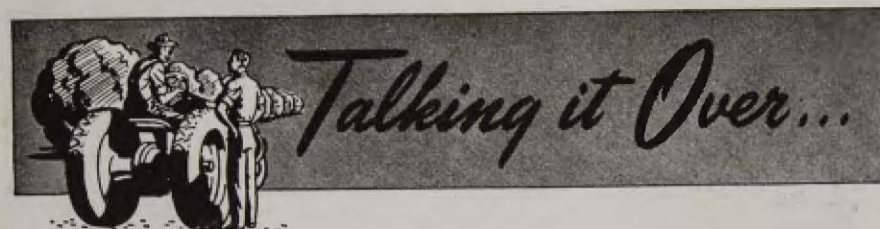
## "Boston Blackie" Trains



It would appear that Chester Morris, famous as "Boston Blackie" in the movies, knows a good thing when he sees it. Orange juice, freshly squeezed and plenty of it, helps to keep the star of Columbia Pictures' famous mystery films in tip-top condition.

# The Sunkist Courier DEPARTMENT

Compiled in the Offices of the California Fruit Growers Exchange and  
Published by Authority of the Board of Directors



If you haven't been up in the Tulare County citrus area recently, you owe it to yourself to take a trip up that way. Most people driving north from Los Angeles stay on highway 99 and wonder where the Tulare County citrus industry is because you can drive from Bakersfield to Sacramento and only see a few scattered trees. Once you get off highway 99, you will really begin to enjoy the San Joaquin Valley even on a warm summer day.

In our most recent trip to Tulare County, we started almost at the top of the citrus belt and worked down. We broke away from highway 99 at Tulare, went up to Visalia and a little farther up to Orosi. We then turned back and swinging east, went over to Woodlake. From there, we swung a south-easterly loop through Lemon Cove to Exeter. Then we continued south to Lindsay and Strathmore and on into Porterville. From that bustling city, we went southwest through Magnolia, Terra Bella, Ducor and Richgrove and joined highway 99 again at Famoso for the return home. Time did not allow us to get up to Sanger which marks the northern limits of the Central California citrus territory.

There against the slopes of the Sierra Nevadas is the Tulare County citrus area. Citrus is interspersed with grapes, olives, peaches, tomatoes and a fairly large production of hay and dry farmed lands. The general appearance is somewhat different than Southern California since there is an even greater diversity of production in an area that is roughly 90 miles long but quite narrow.

The navel crop for the coming season looks very promising, according to reports from the district. Early estimates indicate that sizes will be slightly better than last year and the fruit is beginning to break color already.

Land values in the Tulare County area are rather amazing when compared with prices quoted in Southern California. Top citrus groves are quoted at about half the price being asked for good property in the southern part of the state; furthermore, long time growers in Tulare County believe that the prices being asked up there are "high"! At first glance it would appear that there is some fundamental reason for the wide discrepancy but, there are growers in the area who told me they were willing to compare results with other producing areas over a long period of time.

One grower expressed a rather novel answer. He said, "We consider citrus growing as just another agricultural activity and not a 'way of life.' We do not think that every 10 acre citrus grove has to have a 10-room house and maybe a swimming pool." While he was undoubtedly speaking facetiously, there seems to be an element of logic in the statement. The entire area, citrus and all, has the appearance of "farming" more than does the Southern California citrus area. Many of the growers in Tulare County do not live on their groves but live in any one of the several communities through the area. Consequently, they do not regard their citrus groves as a home and the extra cost per acre for a good home is not quoted in the sale price. Another answer to the price question could be that there are just more people who want to live in Southern California—plus the greater future possibility of subdivision in some of the Southern California property.

Water is definitely a limiting factor to the planting of new acreage. To a great extent, this accounts for the fact that there is approximately the same amount of citrus in Tulare County in 1946 as there was in 1925. Just what the Central Valley Water Project will do for the dry farmed land in the district is a moot question.

The entire appearance of agricultural activity in Tulare County is very exhilarating. There is a certain atmosphere of farmers hard at work and exceptionally proud of their crops and the district in which they live. Citrus groves look exceedingly good. The general appearance of trees is probably better than the average in Southern California. The same thing is true of all other crops grown in the valley. It's a great country. If you haven't been up there recently, take a few days this fall and cover it. You'll enjoy every mile of your trip.

## DO YOU REMEMBER . . . . . ?



. . . . . When county fair floats were pulled by dapple-gray steeds? This picture was taken at an Orange County Fair about 1910. One wag from the area says that the pumpkins on top were really Valencias . . . . They grew a little larger in those days!

### Orange-Grapefruit Sales (Continued from Page 463)

The Southern California grapefruit season closed in September on a market that saw 80s and larger fruit selling at good prices but 100s and smaller meeting slow demand at lower prices. The removal of grapefruit from price ceiling restrictions resulted in a general rise in 80s and larger which increased interest in the smaller sizes.

#### August Shipments High

Total industry shipments were 917 cars during August compared with 517 last year and 665 two years ago. Exchange sales for the month were 832 cars compared with 568 cars sold in 1945 and 595 cars in 1944. The August f.o.b. average this year was 64¢ per box less than last year.

First shipments of the estimated 60,000 boxes Isle of Pines grapefruit crop reached the Atlantic Seaboard late in August. The fruit was reported to be of good quality but lacking in juice.

### Produce Marketing (Continued from page 463)

It is generally agreed that normal competition will eventually bring about proper pricing on perishable merchandise. It is also agreed, however, that much damage can be done until the necessity for competition becomes apparent. Consumers will be paying too much for merchandise and producers will not be receiving its proper value.

Since all perishable produce with the exception of oranges and bananas is now operating without price ceilings, competitive pricing should begin to show up in the very near future especially on those items which are in long supply.



Exchange shippers will harvest a crop approximating 55,653 cars of citrus fruit during the coming year, according to preliminary crop estimates.

General Manager G. Harold Powell, accompanied by T. H. Powell, W. F. Dahlgren, H. J. Ramsey and P. S. Armstrong, left recently on the annual fall trip to Exchange division sales offices.

Indicating great activity in citrus plantings, a Florida nursery inspector reported that almost six million citrus trees were sold in that state during the year just closed.

"Orange Weeks" scheduled for 1922 will cover 387 markets in the U. S. and Canada, according to James O. Cook, Jr., manager of Exchange Dealer Service.

Dana King, orange sales agent, recently returned from a six weeks' tour of important European markets located in England, France, Belgium and The Netherlands.

Although 53 per cent of California farmers own automobiles, only one-third of all U. S. farmers have cars of their own, as indicated by the recent census report.

### CITRUS SHIPMENTS

Season Carlot Shipments from November 1, to Week Ending Sept. 10

Week's Ending	Week's Shipments Calif.-Ariz.	Week's F.O.B. Pk.-Bx.	Total Calif.-Ariz. From Nov. 1	Total U. S. From Nov. 1
<b>ORANGES</b>				
9-7-46	1,090	4.69	73,280	159,071
9-8-45	1,601	3.71	89,801	171,965
9-9-44	1,681	4.22	87,378	187,459
<b>GRAPEFRUIT</b>				
9-7-46	62	3.14	9,445	60,576
9-8-45	68	3.19	11,517	52,556
9-9-44	89	3.47	9,909	54,947
<b>LEMONS</b>				
9-7-46	239	3.37	20,271	20,271
9-8-45	320	5.07	21,032	21,032
9-9-44	272	4.57	21,816	21,816

### More and Better Food

COMPARISON of food consumption in the United States during World War II with that during World War I indicates, says the U. S. Department of Agriculture, that civilian consumption per person averaged 10 to 15 per cent higher in 1942 to 1945 than in 1917 and 1918. The average diet during World War II was also much better from the standpoint of nutritive content than it was in 1917 and 1918.

In contrast, Continental Europe, according to a midsummer summary by the Bureau of Agricultural Eco-

nomics, is passing through a serious food crisis. Usually adverse weather, coupled with war-caused dislocations of agriculture, cut production in 1945-46 to the lowest point in many years, and taking continental Europe as a whole—consumption in 1945-46 fell to around 80 per cent of prewar. Although food production in Continental Europe in 1946-47 is expected to improve over 1945-46, any real improvement in consumption is dependent upon maintenance of food imports close to the level of 1945-46.

In farming as in everything else it's a question of "p's" and "q's". P for production and Q for quality.

## CITRUS TREES

Let us tell you how to lessen Lemon tree disease  
Loss and reclaim tree vigor through use of  
"SANDWICH" trees.

Approved strains. Careful Root and Bud selection  
Nursery inspection invited.

Washington Navel Orange  
Valencia Orange Marsh Seedless Grapefruit  
Eureka Lemon

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TREES GROWN IN SAN FERNANDO VALLEY

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## NEWS of INTEREST to CITRUS GROWERS

A horizontal shell and tube brine cooler was shipped via air from New Jersey to the El Modena Citrus, Inc. plant in Orange, California, recently thus gaining 10 days shipping time and saving fruit for growers.

Figures based on reports from canners show California canning tomato acreage to be about 132,000 acres. Last year 120,819 acres were harvested.

A nation-wide advertising campaign in magazines, newspapers, billboards and radio has been started by the California Almond Growers Exchange of Sacramento to help move an anticipated bumper almond crop.

Tree-Sweet Products Company in Santa Ana, processors of citrus juices in California and Arizona have announced a \$300,000 plant expansion program. Increased demand for orange juice necessitates this enlargement.

C. A. Griffith, president of the Azusa Foot-Hill Citrus Company, has announced that his organization will combine packing operations with the Azusa Citrus Association.

Hereafter Desert Grapefruit labels on boxes containing the product from Coachella Valley will have the additional identifying inscription of Coachella Valley. Grapefruit growers and members of the industry have reached an agreement on methods of advertising.

It was recently announced in Washington by the Department of Agriculture that Morgan U. Ward of Anaheim had been appointed a member of the administrative committee for the California-Arizona desert grapefruit marketing agreement program for the year ending July 31, 1947.

Citrus Foods, Inc. of La Habra attained practically full production recently. The present set-up is devoted entirely to the extraction and shipping of orange juice.

Paul D. Adams, manager of the Alta Loma Heights Citrus Association, has announced that the addition to the plant is nearing completion. It will be in use by the time the next crop is picked.

The Frank Marshall ranch in Hemet, consisting of 90 acres, of which 50 acres is in citrus trees, was sold to Dr. and Mrs. R. O. Williams of Tucson, Arizona.

C. V. Castle, county farm advisor, has announced the appointment of Morton D. Morse as assistant in agricultural extension for the University of California and his assignment as assistant farm advisor of Los Angeles county. He was discharged from the Army in May, 1946.

The Civilian Production Administration has announced that the emergency famine relief program will receive further aid through the shipment of 66,000 short tons of ammonium nitrate to foreign countries during August and September.

Figures released by the National Fire Protection Association indicate that fire losses in the United States this year will reach a total of \$590 million in property damage. Last year property losses on the farms of America totalled more than \$85 million.

The outlook for fresh fruit and vegetable supplies during the remainder of the season is good. Supplies of canned vegetables will continue to be ample, and more canned fruit will be available than a year ago. The canned fruit pack will be larger and civilians will get a large amount of it.

Wallace McIntyre of Lemon Grove recently assumed the management of the packing house of the Carpinteria Lemon Association.

W. A. Myers, Rialto's pioneer citrus grower, returned to his birthplace at Troy, New York, recently in celebration of his 80th birthday.

The Agricultural Extension Service in Orange County recently announced the appointment of Mrs. Marian Prentiss as Home Demonstration Agent, to succeed Miss Frances Liles, who retired recently after 22 years of service. Mrs. Prentiss received her training in home economics at the Oregon State College at Corvallis.

From San Francisco comes word that Stuart Bevier Show, who for the past 20 years has been chief of California's national forests, is leaving the U. S. Forest Service to become deputy director and chief silviculturist in the forestry division of the United Nations Food and Agriculture Organization.

Pacific Transport Lines, Inc. have just inaugurated a new service to the Orient . . . operations beginning at Los Angeles. Shanghai, Hong Kong and Manila now have fresh Southern California oranges. It is a Pacific Coast company, both in capital and personnel, and the three C-3 passenger-cargo freighters have accommodations for 12 passengers and 50,000 cubic feet of refrigerator space for perishables. There are more than 7,000 tons of general cargo space.

At the present time there are 38,000 Mexican Nationals in the United States . . . 20,000 of which are in California. They have been imported from the agricultural districts of Mexico since 1943. . . . They are picking oranges, beans, strawberries and peppers.

New plantings of California fruit and nut orchards and vineyards totaled 34,435 acres in 1945, says California Crop Reporting Service. This brings fruit and nut acreage to 1,500,426 acres, 110,332 being non-bearing. 260 acres of Navels and 868 acres of Valencias were planted.

California's olive crop is again reported to be light and uneven. Heavy blossom, heavy fruit drop, irregular fruit set.

Charles Gordon Phillips has sold his 40-acre orchard located east of La Habra to Andrew Stearns of the Boston department store family. The land is planted to oranges and includes a few acres of avocados.

Farm real estate prices continue upward, 4 per cent in the period March-July, reports BAE. This means a total rise of 13 per cent since July, 1945, and 77 per cent above the average for 1935-39, and within 20 per cent of the 1920 inflationary peak.

The 10 million dollar Med-fly reimbursement bill passed by the U. S. Senate, after Senator R. W. Taft withdrew his objection in the closing hours of Congress did not fare so well in the House, where Joseph Martin, minority leader, blocked passage by threatening a filibuster.

The outlook for fresh fruit and vegetable supplies during the balance of the season is very good. Supplies of canned vegetables will continue large and more canned fruit will be available than a year earlier. This year's pack of canned fruit is expected, to be substantially larger, if cans are available.

New canning plants or enlargements of existing ones are being announced from month to month, reports "Citrus," Florida.

Dr. A. F. Camp, of the Lake Alfred, Florida, Experiment Station, will leave soon for South America to pick a site for a laboratory for use in studying the tristeza disease, a joint Florida-Texas program.

California led all other states in production of 14 of the nation's 23 leading fruit and nut crops during the past season.

Ross Gast of Monrovia recently bought several hundred native varieties of hibiscus from Hawaii.

With resumption of activities the Voorhis Unit of the California Polytechnic School, San Dimas, expects enrollment of students to exceed 275, double the pre-war total. One-third of the students are enrolled in citrus production courses. Harold Wilson is in charge.

The set of Navel oranges is spotty, fruit sizes are much better than a year ago in Los Angeles County, reports Harold J. Ryan, Agricultural Commissioner. Fall lemon crop generally is very light.

Agricultural Extension Service offices in the Federal Building in Santa Barbara are now in Room 214, second floor, instead of Room 15, reports Sydney A. Anderson, Farm Advisor. Same telephone number, 5189.

Paul S. Armstrong, CFGE general manager, and L. W. Otto, manager of the Los Angeles office of the Berkeley Bank for Cooperatives, were speakers on the recent program of the American Institute of Cooperation held at Purdue University, Lafayette, Indiana.

No shortage of tin cans, but manufacturers report difficulty in getting cans to canneries because of critical shortage of freight cars.

The Florida Citrus Commission has authorized a \$320,000 radio program for next season, beamed at 16 terminal markets and 26 southeastern markets. New Florida crop is maturing satisfactorily, may reach market somewhat earlier than usual.

Bureau of Agricultural Economics survey reports of farmers interviewed about 75 per cent think land values have reached the limit of safety; most think their own farms would command more on the present market than they are worth.

Homer L. Hostetler, pioneer San Gabriel Valley orange grower, passed away recently at the age of 70. He had served as a director of the Irwindale Citrus Association and of the Azusa-Covina-Glendora Fruit Exchange.

Five years of frozen food industry progress in California: Frozen fruit output has increased nearly thirty-fold in five years, to 166,531,761 pounds; vegetable pack has increased eight times, to 48,074,479 pounds. Apricots and peaches are the leaders, closely followed by apples and applesauce, not frozen in 1940. Beans are the frozen vegetable leader, broccoli second.

If the Citrus Industry is to continue on its expanded basis, USDA economists point out, growers must continue to put a large part of their output into processing. Among possible new products mentioned are jellied citrus fruit and hard tablets of citrus juice.

Appalachian states, Virginia, Pennsylvania, West Virginia, Maryland, are advertising that "It's a vintage year" for their apples, a 27 million bushel crop.



# New Accents for Fall

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Orchard Heaters

## Soil Studies

(Continued from Page 461)

a sufficient number of trees would have received additions of a particular nutrient to give a fairly reliable indication. As may be seen from the table the treatments consisted of various sources of nitrogen, together with combination treatments involving phosphate, potash, calcium salts, magnesium salts, sulfates, soil acidification treatments utilizing sulfur, sulfuric acid, nitric acid, iron sulfate, aluminum sulfate as well as sulfur dioxide, and finally, certain combination treatments involving all of the known essential plant food elements (A-H treatment), and an additional treatment in which traces of many other minor elements were added to the basic A-H treatment. This latter treatment was designated as A-Z. Also, included were manure treatments at two rates. The nitrogen was applied in split applications so as to avoid any possibility of fertilizer injury. The total nitrogen added during the 18 months of this experiment has ranged from 8 to 16 pounds nitrogen per tree. This is considerably in excess of that used in the unbasined portion of the block and has been of value in indicating whether heavy nitrogen fertilization would exert any effect on the course of the disease.

Comparison of the number of healthy and sick trees at the outset with the number of these at present shows that the disease has advanced markedly in the 18 months of our observations. In no case has a tree which showed definite decline symptoms at the outset become completely healthy. While there has been temporary improvement in many of the trees, only one tree in the entire block has shown a definite improvement which to date is holding up. This tree was in a fairly advanced stage of decline at the outset but in August, 1945, began to show improvement. While it can not as yet be classed as fully healthy the improvement it made a year ago is still apparent and is being sustained. This tree has received regular additions of sulfuric acid. Soil reaction in the basin surrounding this tree has been reduced to around pH 4.0 though it varied some from time to time. However, other trees which have received sulfuric acid as well as other soil acidification treatments and in which the pH has been brought to just as low values have not shown improvement hence we are at present very doubtful whether acidification has anything to do with the improvement of this one tree.

In general then, nothing definite has emerged from this experiment as yet to indicate that Quick Decline is the result of a nutritional deficiency or is there any good indication that the disease can be arrested by any of the soil fertilization or amendment treatments tried.

The rate of decline and collapse on the basined trees compared with the unbasined trees is of interest in that the basined trees have had more nitrogen and more frequent irrigation than the unbasined trees. The data

for this comparison are given in Table 3. While a greater percentage of trees in the unbasined area have collapsed during the 18 months of this experiment, a greater percentage of originally healthy trees in the basined area have begun to show signs of distress than in the unbasined area. The important indication is that, despite the addition of more nitrogen and water to the basined trees, there is no evidence to date that the disease has been in any way arrested, though it might be that the final collapse stage has been delayed somewhat.

## Nitrite Studies

Part V

As indicated earlier, regular determinations of nitrate and nitrite have been made following the additions of the various nitrogen fertilizers and manure. While in other soils we have noted that urea additions usually produce more or less nitrite temporarily, in only one instance on this soil have

we detected more than a trace of nitrite from urea additions. None of the other nitrogen fertilizers including manure at a rate to supply 6 pounds nitrogen per tree have ever shown more than a trace of nitrite. The fertilizers have been added at various seasons of the year and many hundreds of nitrite tests made. Many trees which were entirely healthy at the outset and in which there was no sign of root rotting or of starch lack have seriously declined during the 18-month period of our experiments. Tests for nitrite in the basins around such trees have never shown more than a trace. On the basis of this evidence, it seems rather doubtful that nitrite has anything to do with Quick Decline of oranges.

## Greenhouse Studies

Part VI

In the spring of 1945 a block of orange trees, many of them showing decline, were pulled in the Covina area. It was noted that below 9-18"

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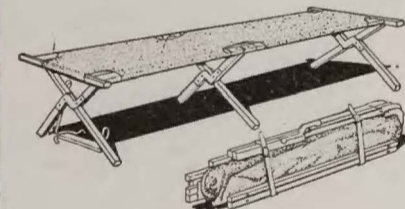
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ALSO A QUANTITY OF USED TENTS, SAME SIZE, LESS THE POLES AND STAKES, AT \$19.51 EACH  
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**New Cots—Used Cots**

Heavy Canvas Navy Type with metal corner braces Same type as new. All in good condition.

**\$4.87 \$2.92**

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**Fire Extinguisher**

1 gal. including pressure gauge & pump, C.T.C. Phister No. 1B, all in guaranteed good condition.

**\$16.59**

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1 qt. C.T.C. w/o bracket, all in guaranteed good condition

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TABLE 2. Soil Treatment and Tree Condition Changes in Covina Experiment

Treatment No.	Treatment	Amount per tree from beginning to August, 1946	February, 1945		July 30, 1946	
			Healthy	Sick	Healthy	Sick
TREES BASINED AND TREATMENTS BEGUN FEBRUARY, 1945						
A	Urea	12 lbs. N	2	1	0	3
B	Urea	12 lbs. N	3	1	2	2
C	Straw	150 lbs. straw	2	1	2	1
D	Ammonium sulfate	12 lbs. N	2	1	2	1
E	Sodium nitrate	12 lbs. N	1	1	1	1
F	Calcium nitrate	12 lbs. N	2	1	0	3
G	Manure	10 lbs. N	2	1	0	3
H	Manure	40 lbs. N	2	1	0	3
I	Ammonium nitrate	12 lbs. N	10	1	4	6
J	Ammonium nitrate	12 lbs. N	2	1	1	2
K	Tr. s. phosphate	20 lbs. P <sub>2</sub> O <sub>5</sub>	2	1	1	2
L	Tr. s. phosphate (inj.)	15 lbs. P <sub>2</sub> O <sub>5</sub>	2	1	2	1
M	Ammonium nitrate	12 lbs. N	2	1	0	2
N	Potassium sulfate	20 lbs. K <sub>2</sub> O	2	1	0	2
O	Ammonium nitrate	12 lbs. N	3	0	0	3
P	Potassium sulfate (inj.)	20 lbs. K <sub>2</sub> O	2	1	1	1
Q	Ammonium nitrate	12 lbs. N	2	1	1	1
R	Phosphate & potash (inj.)	16 lbs. N, 15 lbs. P <sub>2</sub> O <sub>5</sub> , 20 lbs. K <sub>2</sub> O	2	1	1	1
S	Ammonium nitrate	12 lbs. N	2	1	1	2
T	Sulfur	50 lbs. S	2	1	1	2
U	Ammonium nitrate	12 lbs. N	1	2	0	2
V	Sulfur (inj.)	50 lbs. S	1	2	0	2
W	Ammonium nitrate	12 lbs. N	2	1	0	3
X	Gypsum	266 lbs.	2	1	0	3
Y	Ammonium nitrate	12 lbs. N	2	1	0	3
Z	Magnesium sulfate	77 lbs. MgSO <sub>4</sub> · 7H <sub>2</sub> O	2	1	0	3
A-H	A-H†		7	6	2	11
A-Z	A-Z‡		2	1	2	1
TREATMENTS BEGUN AFTER FEBRUARY, 1945						
T	Ammonium nitrate	8-10 lbs. N	1	4	1	2
U	Sulfuric acid	81-90 lbs. H <sub>2</sub> SO <sub>4</sub>	1	4	1	2
V	Ammonium nitrate	8-10 lbs. N	0	2	0	2
W	Nitric acid	70-91 lbs. HNO <sub>3</sub>	0	2	0	2
X	Ammonium nitrate	8 lbs. N	1	1	0	2
Y	Aluminum sulfate	50 lbs. Al <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub>	1	1	0	2
Z	Ammonium nitrate	8 lbs. N	1	1	0	2
A-H	Sulfur dioxide	8.75 lbs. SO <sub>2</sub>	1	2	0	2
A-Z	Ammonium nitrate	8 lbs. N	1	2	0	2
A-Z	Iron sulfate	50 lbs. FeSO <sub>4</sub>	7	4	3	7
A-Z	Ammonium nitrate	8 lbs. N	7	4	3	7

† In all cases the nitrogen fertilizers were applied in small, frequent doses.  
‡ A-H treatments consists of calcium nitrate, magnesium sulfate, zinc sulfate, boric acid, copper sulfate, treble superphosphate, potassium sulfate. In all, each tree has had 12 lbs. N, 20 lbs. P<sub>2</sub>O<sub>5</sub>, 20 lbs. K<sub>2</sub>O, 77 lbs. MgSO<sub>4</sub> · 7H<sub>2</sub>O, 0.2 oz. Boron, 2 oz. zinc, and 1 oz. copper.  
‡ A-Z treatment consists of the same materials as used in the A-H treatment plus traces of molybdenum, aluminum, antimony, arsenic, barium, bromine, chromium, cobalt, fluorine, lead, lithium, mercury, nickel, rubidium, selenium, silver, strontium, tin, titanium, vanadium, and zirconium.

the soil was a rocky, gravelly sand, and that root growth in this zone was exceedingly limited. In order to determine whether there was anything about this subsoil inimical to citrus soil and the gravelly subsoil were taken for pot culture study. The soils

were mixed and potted in 2-gallon pots differentially treated with various fertilizers and fertilizer combinations, and planted to both sweet and sour orange seedlings. For comparison a batch of soil from a non-decline area was likewise potted, fertilized, and planted. Excellent seed-

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TABLE 3. Comparative Behavior of Basined and Unbasined Trees

	Basined trees	Un-Basined trees
Total number trees on sour root	100	147
Per cent showing decline symptoms, Feb., 1945	38	60
Per cent showing decline symptoms, July 30, 1946	78	82
Per cent of total trees which collapsed between Feb., 1945 and July 30, 1946	6	14

ling growth was obtained in both the surface and subsoil from the decline area. There was no response to any

fertilizer save nitrogen. Pictures showing the seedling growth in the surface and subsoil of the decline area and the nondecline area are presented in Figures 1, 2, and 3. It is evident from this that there is nothing toxic about the gravelly sandy subsoil which characterizes this area and aside from nitrogen no evidence of a lack of phosphorous, potassium, calcium, magnesium, or sulfur in either the surface or subsoil.—George F. Liebig, Jr., and H. D. Chapman.

**Conclusions**

All of our data and observations to date point to some factor other than nutrition as the primary cause of Quick Decline of oranges. There are no indications that toxic substances such as nitrite are in any way involved, neither does it appear that the course of the disease is appreciably altered by any of a considerable number of fertilizer treatments. However, insufficient time has elapsed

for the full effect of many of the fertilizer treatments to manifest themselves and since there is the remote possibility that some as yet undiscovered nutrient element might be involved, final conclusions as regards the role of nutrition in this disorder cannot be drawn.

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**Japanese Beetles Intercepted**

THE State Department of Agriculture reported today that live Japanese beetles, a voracious fruit and vegetable pest, had been found in clothing packed in a suitcase brought from Maryland by private automobile.

The interception was made in the course of routine inspection at the California plant quarantine station at Daggett, the discovery being credited to Inspectors Albert Weir and Delmar McCreary.

The owner in whose suitcase the infested garments were found said she had taken the clothes from a line prior to leaving by automobile for California. The beetle, serious agricultural enemies not known to occur in California or on the Pacific Coast, were in heavy seasonal flight in Maryland the day she left for the west, she said.

The Japanese beetle is one of the nation's major agricultural pests for which plant inspectors make a search in the baggage and belongings of travelers entering California. If this beetle should become established in this state, as it is in the east, hundreds of thousands of dollars, perhaps millions, would have to be expended in control measures, and the loss of fruit accompanying the infestation would add a tremendous blow to California agriculture.

**Watch for Gummosis Now**

GUMMOSIS infections make headway in citrus groves, especially young replants, during the warm summer months. Frequent inspections for this trouble may catch it in the beginning stages.

Over-irrigation, poor drainage, and deep planting are inducive to gummosis. The disease usually occurs where excessive water is allowed to stand around the base of the tree. It is usually prevalent in heavy soils.

Gummosis is recognized by masses of amber-colored gum which break out from the trunk near the crown of the tree, with a killing of the bark below and above the ground. The foliage turns yellow and the tree may die after the disease has been present for a short time.

All affected bark should be cut out and the exposed surfaces painted with a good disinfectant. Leave exposed to the air until healing is complete. —A. G. Salter, Farm Advisor, San Bernardino County.



"Remember back a few years, Joe," Boss he ask to me, "when we got sharp frost along about November first? That was two weeks before Floyd Young began his nightly frost warning broadcasts over KFI. Well Joe, the weather is about as unpredictable as your Maria."

"That cold snap caught us with the orchard heaters still under the trees, and we lost quite a bit of fruit. Nothing we could do about it—then. Made up my mind not to get caught that way again. So you got a job for the next few days. You and Pedro will be putting out the pots and filling them. Already I got plenty oil in the tank."

**Research Bill is Given Approval**

PRESIDENT Truman believes the agricultural research bill (H.R. 6932) which he signed August 14 is a "major step for the improvement of the private agricultural marketing system of our country."

In a statement issued following his approval of the measure, President Truman said that "our greatest peacetime agricultural problem is the efficient marketing of adequate quantities of the right kinds of food and other farm products. The basic research provided for in this bill will help solve the problem and will be of great value to future generations."

This bill had the strong support of all farm organizations. As passed it contains the recommendations pertaining to joint federal-state supervision sponsored by the National Grange, the National Farmers Union, and the National Council of Farmer Cooperatives.

Part of the text of the President's statement follows:

"Agricultural marketing is the means by which we get food and fiber from our farms to consumers. Anything that increases efficiency in moving farm products to consumers is a material contribution to the nation's welfare. I note that this legislation has the support of producers, distributors, and consumers, and was passed by both Houses of Congress without a dissenting vote.

"It is to research that we must attribute much of our progress on the food front as well as on the battle front during the war. Now as we move into a new period of peace basic research and the application of the results, become even more important."

Practically all fresh fruits and vegetables reached wholesale markets in heavier volume than a year ago, and a number of commodities were in over-supply during most of August.



**For Tomorrow's GOLDEN HARVEST**



THE SAME rich soil and warm sunshine that will bring these two-year-old lemon trees (above) to fruitful maturity also causes heavy growths of weeds. Here, they are nearly as high as the trees. That's why this hilltop lemon grove is being disked for the second time in one season. And since the 70 acres of citrus trees are planted on hills, an efficient, powerful tractor is needed for the job of uphill, downhill cultivation—an International Diesel TD-6.

The TD-6 is teamed up with a Dyrr Model-SO Disc Harrow, designed especially for such work, and together, this cultivating combination does the job in four 11-hour days. That's efficient power! It's economical power too, using only 20 gallons of low-cost Diesel fuel per 11-hour day.

This is just one example of how International TracTractors get the job done at minimum cost. They're built for hard work and long hours of service with maximum freedom from delays and costly breakdowns. Internationals are better balanced for constant true traction to give you more "pulling power" in any terrain.

Your International Harvester dealer will be glad to give you the information you need for effective, low-cost citrus cultivation. See him for the facts about International Crawlers and the complete line of Dyrr Tillage Tools.

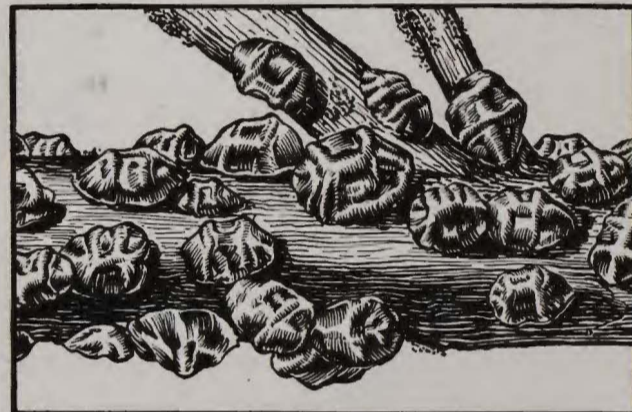
● ESPECIALLY designed for fruit growers, The McCormick-Deering Orchard and Grove Tractors are ideally suited to citrus groves. Functional streamlining, short turning radius and differential steering brakes are only a few of the outstanding features of these unique tractors. The streamlined shielding protects branches and fruit by letting them glide over smooth surfaces when the tractor is working close to the trees. The short turning radius permits these tractors to move easily in and out of the rows of trees. Orchard and Grove Tractors are available in two models—0-4 and 0-6—with your choice of high-compression straight gasoline engine or combination distillate-gasoline engine. See these special tractors at your International Harvester dealer's.



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Scale insects that feed on your trees and spoil fruit are like racketeers cheating you of hard-earned profits



BLACK SCALE devitalize trees by feeding on branches, leaves and young fruit. They also secrete large quantities of honey dew in which smothering layers of sooty-mold fungus grow rapidly.



RED SCALE (above right) and PURPLE SCALE (below) feed on leaves, fruit and branches. Scale-marked fruit is unsightly, misshapen and usually unsalable. These two species do further damage by

injecting into tree tissues a toxin which causes yellowing of leaves and ultimate defoliation. Die-back of twigs, branches—sometimes even large limbs—also results from this scale-injected toxin.

**Are these Racketeers Cheating YOU of Hard-Earned Profits?**



THERE'S NO NEED to pay tribute to these insect racketeers. Protect your trees—and your profits—with Shell Triona Soluble, the oil with proved efficiency in controlling scale and other insects.

Shell Triona Soluble is so easy-spreading it enables you to cover all possible areas of infestation. And it makes an even, continuous film that holds contact until both insects

and eggs are destroyed.

Triona Soluble's adhesive quality keeps run-off waste to a minimum. Yet it resists penetration of tree tissues. Try it. Check its efficiency, its spreadability, economy, effect on trees. On all counts you'll find Shell Triona Soluble a trustworthy spray oil. Order yours from the nearest Shell office. Shell Oil Company, Incorporated.

**SHELL ORCHARD SPRAYS**

FOR ECONOMICAL, EFFICIENT PEST CONTROL



Mr. Smoyer is a member of the Agricultural Extension Service staff of Los Angeles County and a specialist in subtropical horticulture.

## Irrigation of Citrus and Avocados

By KENNETH M. SMOYER

**I**RRIGATION is the most important of all orchard operations. Normally, more good or more harm can be done by irrigation than by any other orchard management practice. It requires more skill and understanding than any other operation. In the southwest, lack of summer

rainfall makes it necessary to apply water artificially during the dry season. The length of the irrigation season depends upon the amount and distribution of rainfall. In general, the irrigation season for evergreen tree crops is from April through Oc-

tober. Occasionally, the first rains do not occur until the middle of December, making one or two extra irrigations necessary. In years of unusually light rainfall, the first irrigation may be as early as March. The grower's problem is to see that the plant has water available at all seasons of the year, yet as a matter of economy using no more water than needed.

Good irrigation practice for orchards consists in keeping the trees well supplied with water at all times. Observations indicate that periods of dryness, even though of relatively short duration, tend to reduce the quality of citrus fruit. An inadequate supply of water reduces the amount and size of fruits and rate of tree growth of both citrus and avocados. Lack of water during the ripening period hastens citrus color, but delays maturity as judged by the sugar-acid ratio test.

The principles of irrigation are simple, yet applying them is difficult until the grower becomes acquainted with his orchard conditions. There can be no fixed set of irrigating rules which will fit all orchards. There are certain facts, however, that should be kept in mind in learning how to irrigate efficiently. The features discussed here pertain to any kind of tree crop, but are discussed primarily for citrus and avocado growers.

### What Happens to Water in the Soil

When water is applied the soil pore spaces contain a certain amount of free water which will continue to drain downward for a day or two after irrigation stops. The amount of soil wet by this free water is greater in sandy soils than in clays and it varies with the depth of wet soil above it. For all practical purposes, however, the grower can assume an additional penetration of 3 to 12 inches after the water is shut off, depending on the texture of the soil and the depth previously wetted above. When

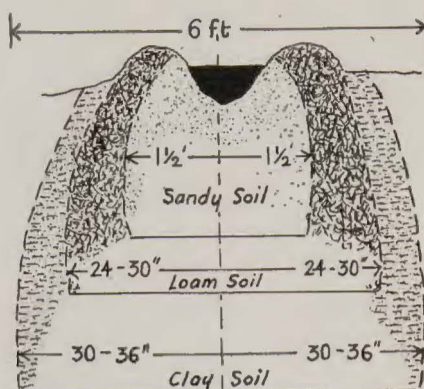


Fig. 2. Lateral spread of water from a furrow or from side of a basin varies with the kind of soil.

water ceases to move downward readily, the soil is at "field capacity."

When most of the soil inhabited by the roots becomes so dry that the plants wilt, the soil is at the "wilting point." This point is the same for all kinds of plants in a given soil. When plants wilt there is still some water left in the soil. Heavy soils hold more tightly than light soils so may seem quite wet when they are at the wilting point. Water should be applied only to soils that are approaching the wilting point; that is, soil which has yielded most of the water available to the plants.

Soils vary in their capacity to hold water and to deliver it up to the plant. The clay and adobe soils (heavy or fine textured soils) hold more water than the sandy soils (light or coarse textured soils). The average soil will deliver to plants about half of the total water it can hold. The usable amount (between field capacity and wilting point) is known as "available moisture." However, some soils yield as much as three-fourths of their water to plants and others less than one-fourth. As a result, two soils which are quite different in total water holding capacity may yield about the same amount to plants. It is this variation in available moisture of soils which makes the interval between irrigations differ. During mid-summer, mature trees on the heavier soils generally require irrigation every 4 to 6 weeks, and those on sandy soils may require irrigation every 10 to 15 days.

Coarse textured soils usually absorb water faster than fine textured ones. Plow pan or natural stratifications in the soil will often change the rate at which a soil will normally take up water. The furrows next to the trees usually absorb water more rapidly than the center furrows where the machine traffic has compacted the soil. Water should be allowed to run in furrows only until the desired depth of penetration has been reached. The rate that soils absorb water determines the distance between pipelines that deliver water to the furrows.

When a soil is irrigated, it is wet completely as far down as the water penetrates. Applying more water results in a greater depth being wet, not in increasing the amount of water in the depth already wet. The drier a

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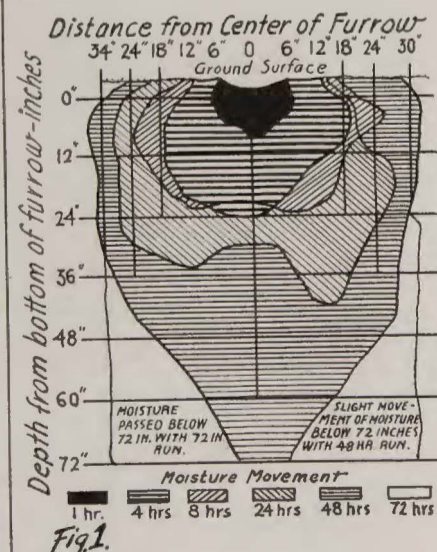


Fig. 1. Distribution of water from a furrow, after running water for different lengths of time on a clay loam soil.

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**GREENOL READY-MIX** is another "ORTHO" Phytonomic Oil. Used with GREENOL Conditioner it has exceptional wetting qualities with low oil deposits. A favorite in the interior districts where high temperatures impose the most exacting requirements.

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 <b>Oranges</b> —The keeping quality of this fruit is enhanced by the Brogdex natural hot wax process.	 <b>Grapefruit</b> —Naturally lends itself to Brogdex protection which assures delivery of the best in juiciness and flavor to the consumer.	 <b>Lemons</b> —A natural wax emulsion to prevent shrinkage and decay in storage and hot wax for shipment gives sound fruit to consumer.	 <b>Tangerines</b> —The little brother of the orange, even more delicate and hard to ship, found new customers with Brogdex protection.
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 <b>Apples</b> —Development of new export markets made possible by Brogdex "keeping quality."	 <b>Pears</b> —Brogdex protected pears retain their natural juiciness, color and zest.	 <b>Bell Peppers</b> —An excellent source of vitamins A and C—Brogdex hot wax protects vitamins and freshness.	 <b>Pineapples</b> —New markets are waiting for the Brogdex protected pineapples—truly ripe, that stand up in shipment.
 <b>Eggplant</b> —Brogdex not only brought more money for full weight but enabled shipment to new and more distant markets.	 <b>Turnips</b> —This humble vegetable has premium quality of tenderness and sweetness, that Brogdex emulsion protects.	 <b>Beets</b> —Freshness, flavor and rich color sell beets, and Brogdex prolongs all three from field to consumer.	 <b>Gardenias</b> —Yes, even gardenias treated before air shipment arrive across country fresh and fragrant for best prices.

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**Irrigation**

(Continued from Page 474)

soil is, the more water it will require to fill it to a given depth. For example, a soil retaining 50 per cent of available moisture will require half as much water to fill it to a given depth as the same soil retaining only 25 per cent of its available moisture.

The downward movement of water is normally more rapid than the side-

ward spread is usually greater on heavy soils than on light soils (Figure 2). Heavy soils require more water to wet them to a given depth than do lighter soils (Figure 3).

Most of the water will remain in the soil unless removed by the roots of plants. The upper 4 to 6 inches, however, will lose water by evaporation. Cultivation does not conserve moisture except in that it kills weeds which compete with the trees for

water. A heavy cover crop will remove as much water as the trees. Most of the water that is lost by evaporation is lost while waiting for the soil to become dry enough to cultivate.

After a soil has reached field capacity, there is no appreciable movement of water in any direction. Water does not rise rapidly enough in the soil from capillary action to be of any particular benefit to plants.

**Where to Apply Water**

Water need be applied only to the area of soil occupied by most of the roots (Figure 4). There are exceptions, such as leaching when injurious amounts of salts are present in the soil or introduced in the irrigation water. Root distribution can be determined by digging small trenches in the soil several places in the orchard—the more the better.

Examinations of the soil, using a soil tube or auger, can also be used to determine the rooting habits of a plant. The soil will be found to dry most rapidly where the largest number of roots occur. This system will make it necessary to allow the soil to approach the wilting point to show the differences in drying. Usually the upper 2 to 3 feet of soil hold the largest part of the roots. On terraces and hill land, roots may act in peculiar ways because of a subsoil that favors neither root development nor water penetration. Examine these orchard soils particularly well.

Abrupt changes in soil texture and density between the top soil and the subsoil will usually keep most of the roots in the upper soil. Moreover, on heavy clay soils, trees will not send their roots as deeply as on lighter soils.

The hilly lands on which most avocado and some citrus orchards are located are generally shallow soils which vary greatly in depth within short distances, or they may be heavy clays. Often these soils are underlain with a substructure highly impervious to water, or one which takes water much more slowly than the surface soil. Under these conditions the surface soil remains in a saturated con-

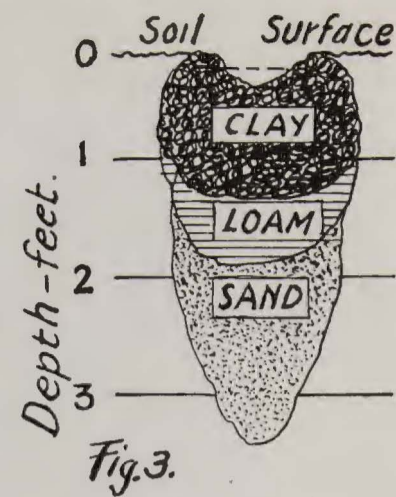


Fig. 3. The penetration of equal amounts of water applied in furrows in three soil types.

dition for long periods, causing serious injury to the tree roots. It is on these types of poorly drained soils that avocado decline is found.

It is essential that the grower be well acquainted with the rooting habits of his trees and the depth and texture changes of the soil throughout the orchard. There are few orchards in which the soils are uniform. Determine what the average condition is and base irrigation on that. Allowances for the more shallow and poorly drained areas should be made wherever possible.

**When to Irrigate**

Experience and knowledge of a particular soil and its variations have no substitute for determining when to irrigate. For new growers, frequent and numerous examinations of the soil are necessary. Following is a simple way to learn when to irrigate. A few days following irrigation, the soil will be at "field capacity." Learn its feel and appearance by inspection. Put a sample of this soil in a sealed mason jar for inspection throughout the year.

Allow weeds to wilt on the outside of the orchard and examine the soil 10 to 12 inches under the surface among the weed roots. This will give

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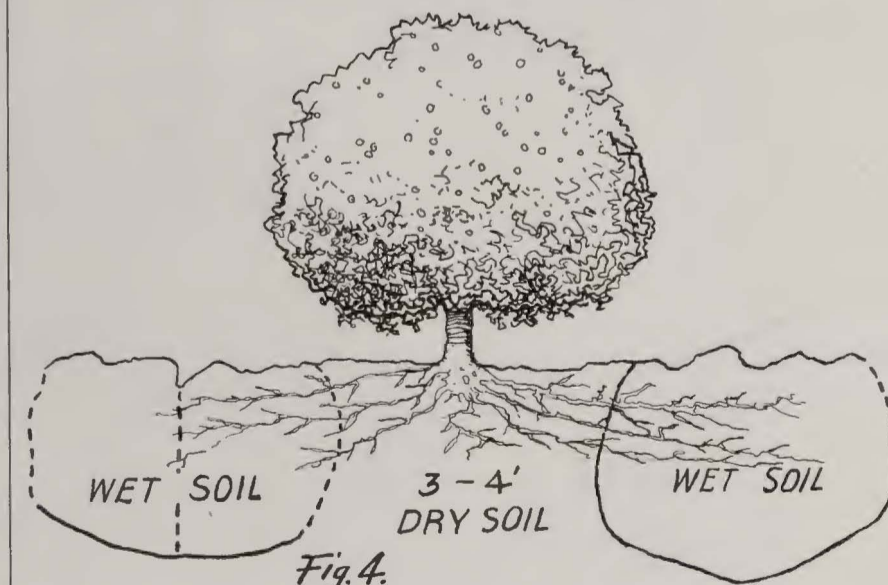


Fig. 4. Wet the soil from under the outer branches to the ends of the roots on two sides of the tree at least. Soils of low water holding capacity should be wet on all sides of the tree when possible. Space furrows so that lateral spread of water will wet all the soil.

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## Irrigation

(Continued from Page 476)

the feel and appearance of the soil at the wilting point. Save a sample of this soil. If the orchard has several types of soil, it will be necessary to establish ranges of moisture for each.

To determine how dry the soil is and to what depth water should be applied requires sampling the soil among the tree roots as deeply as they penetrate. Such sampling should be made in many spots over the orchards. Experience will show that certain areas of the orchard dry first. It will also show that the upper 2 or 3 feet of soil will dry most rapidly. These are the areas that must be wetted. The average condition will have to govern the amount of water to apply and the interval between applications. Insofar as possible, water should be applied in varying intervals and amounts according to the dryness of the soil.

This system for determining when to irrigate is not perfect. Its value depends largely upon the industry and judgment of the individual. A soil tube or a soil auger will facilitate the work in all but the rocky soils where only a shovel works satisfactorily.

In dry, hot weather trees will use more water than when it is cool and humid. The larger and more numerous the trees, the greater the per acre use of water and the greater the area to which the water must be applied, since the roots inhabit a larger part of the soil. The more shallow the root system in a given soil the more frequently it must be irrigated and the lighter the application.

Do not begin to irrigate in the spring until the soil has had a chance to dry out. This is particularly true with heavy and poorly drained soils. In the fall it is also advisable to permit heavy and poorly drained soils to go into the winter on the dry side so that the rains will not create a

saturated or waterlogged condition so readily. Care must be taken, however, to have a fair supply of water in the ground or at least on one side of the tree for protection against possible hot, dry winds.

Soil moisture at all depths should be carefully watched during the spring and fall. It is necessary to have a good supply of moisture at the lower depths to protect against unseasonably early hot spells.

### How Much Water to Apply

When the depth of soil to be wetted has been ascertained, it is then necessary to decide how long to let the water run. The drier the soil the more water it will take to fill it to a given depth. Except after wide and varied experience, a grower will be unable to determine beforehand how long he must run the water to get the desired penetration. The best of experienced irrigators use a probe or a soil tube to determine water penetration.

A suitable probe is made of a

three-foot piece of 3/8-inch high carbon steel with a point tapered to 1/8-inch and a "T" handle. While the water is running, the probe can be pushed relatively easily into the soil as far as the water has penetrated. This is the simplest and fastest means of finding the depth of penetration. Lateral spread can also be determined by this means. A probe can not be used in rocky soils.

Applying water on a set schedule using the same amount of water at every application is not efficient irrigation. In many cases it is impossible to do otherwise. If water is delivered on an unbreakable schedule, proper irrigation is often difficult. In some cases the schedule of water delivery is too far apart and in others too close. The grower then has the task of adjusting the application so that the orchard will get through to the next irrigation without suffering from lack of water.

On heavy soils of high water holding capacity this may mean a light surface flushing every other irrigation, alternating with a good deep irrigation. Irrigating alternate panels and applying half the head of water at shorter intervals will permit heavy soils to dry more and result in better root growing condition. In such cases, the dry side should be allowed to approach the wilting point before water is applied. This system is also advisable in areas subject to avocado decline. Irrigating alternate panels is helpful on light soils of low water holding capacity where the normal schedule is too long between irrigations. In all soils it is considered best to wet at least 65 per cent of the foot area. To avoid disease, the soil next to the trunk of citrus trees should be kept dry.

On deep, well-drained soils, applying excess water increases the water and labor bills and leaches some plant nutrients out of the soil. It is particularly important to watch the depth of water penetration on heavy soils. Here the subsoil rarely dries as fast as the surface. Too frequent irrigation keeps the subsoil so wet that very few roots penetrate into it. It is essential that such heavy subsoils be allowed to dry between irrigations. On soils with a tight or highly impervious sub layer, excessive irrigation often causes a head of water to build up on top of the tight layer for sufficient length of time to seriously injure the roots in that area.

### System of Irrigation

Most groves are irrigated by straight furrows. On the coarse-textured soils of low water holding capacity, it is generally more satisfactory to wet a larger area of ground. With large flows of water, basin flooding may be used. With smaller flows, cross check furrows are more satisfactory. On soils which absorb water rapidly, water can not be efficiently run long distances from the pipelines. Where runs are too great between pipelines, feeder ditches can often be used to carry a large volume of water to the lower end of the run. Here it can be cut into all the furrows for

more even distribution. As a rule of thumb, water should reach the end of the furrow in not more than one-fourth of the total time the water will be in the furrow. The system used in any particular orchard depends upon rate the soil takes water, type, slope of ground, size of irrigating stream, water holding capacity of the soil, and frequency of irrigation. Each grower will have to determine the best system for his own orchard. It can be seen from Figure 1 that the lateral penetration of water on a given soil determined the number of furrows that should be used.

With a sprinkler system, a much better distribution of water can be obtained. Where the soil is shallow, shut off the water sooner than where the soil is deep. With furrows, it is practically impossible to adjust the irrigation to take care of irregularities in soil depth. Distribution of water varies with different sprinklers, but most give a fairly uniform distribution.

The low head sprinkler systems are very adaptable to efficient irrigation. If properly laid out, the so-called drag line quick coupling system or a permanent system of sprinklers can be adjusted to wet the desired area of ground with length of application varying according to the depth and previous wetness of the soil.

If greater care had been taken with irrigation on the shallow and poorly drained soils of many of the avocado areas, there would not be as much avocado decline as there is today. Some growers have accentuated their decline problem by poor distribution of water.

Irrigating is not easy work and many attempts to make it easier have resulted in bad orchard practices. On the deep, fertile, well-drained soils many mistakes in irrigation can be made without much harm, except to efficiency. On heavy and poorly drained soils, small errors are accentuated and may result in serious damage to the orchard.

In irrigating there are no substitutes for the soil tube, probe, experience, sound judgment, and hard work.

### Farm Debts Reduced

Farmers have been reducing their debt burdens during World War II to the point where they can be managed, according to Arthur Shultis, specialist in farm management of the Agricultural Extension Service. They have followed a sound policy in direct contrast to World War I.

The record shows the contrast. Farm mortgage indebtedness increased from about \$5,000,000,000 at the beginning of 1915 to \$8,500,000,000 in 1920. In World War II farm-mortgage debt decreased from \$6,500,000,000 to slightly over \$5,000,000,000 between 1940 and 1945.

Short-term indebtedness more than doubled in the five-year period of World War I, but remained relatively stable during the comparable period for World War II.

# "I WORK FOR 310 CUSTOMERS"

... My Track-Type Power is 'CATERPILLAR' "

Ernest L. Keechler,  
Ontario, California



Many of the groves that Mr. Keechler's outfits tend put a premium on ability to turn accurately with heavy loads. Here one of his operators waves at the city of Ontario's "Caterpillar" No. 12 Motor Grader operator. At left is Ernest L. Keechler who has owned "Caterpillar" machines since 1930!



Blow soil to adobe—wet or dry—Ernest L. Keechler, Ontario, California, has work to do. Particular work—work that requires sure traction and ample power—jobs of work that step on each other's heels, and have to be done on time!

"Besides custom grove and farm work," reports Mr. Keechler, "I farm 500 acres of my own. I do custom work on about 4200 acres representing 310 customers.

"I am 100% 'Caterpillar' on track-type tractors because they are reliable and I can depend on them. (He has 4 D2s, 3 wheel

tractors.) My oldest D2 has worked 13,000 hours.

"I have had no break-downs on any of my D2s other than ordinary wear. My tractors run every day except about 3 weeks of the year when it is actually raining."

In the hands of many fleet owners like Mr. Keechler is tractor experience that would take a lifetime for a single-unit rancher to accumulate. Their experience is yours to apply—without cost or obligation!

CATERPILLAR TRACTOR CO. • SAN LEANDRO, CALIF. • PEORIA, ILL.

# CATERPILLAR DIESEL

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ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

## STANDARD FARM SERVICE NEWS

VOL. IV NO. 9 ISSUED MONTHLY by STANDARD OF CALIFORNIA OCTOBER • 1946

### Flue-cleaning Soot Spills Prevented by Paper Bag

Here's a simple way to keep soot from falling on the floor when you're cleaning out a stove pipe for more efficient burning of Standard Heating Oils.



Standard of California makes a fuel for every type burner. They all burn with full heat value. In your pot-type burner, use Standard Stove Oil. It's light-bodied, distilled fuel that burns especially clean in circulating oil heaters, and in all heaters requiring Pacific Specification 100 oil. Use Standard Furnace Oil in gun-type or automatic burners. It is medium-bodied, distilled, and fully meets Pacific Specification 200. Ask your Standard Man to arrange regular heating oil delivery service for you this winter.

### For Latest Market Reports Tune in Farm Highlights

You can get the Los Angeles produce market quotations early every day of the week except Sunday by listening to Editor Bill Stulla at 6:15 a. m. on Farm Highlights, Station KFI. He also gives you the latest agricultural and world news, weather reports and helpful suggestions.

### HOW TO REMOVE SLUDGE AND LACQUER FROM DIESELS WITH EIGHT-POINT PLAN

You probably have worked your Diesel tractors and trucks pretty hard during the recent summer months. If you haven't been using RPM DELO Diesel Engine Lubricating Oil regularly, very likely high heat and dust have caused carbon and other contaminants to form on vital engine parts. Right now—before you lay your Diesels up or start another season's work—is the time to clean them up inside as well as outside. Here's an easy and effective way to clean contaminants out of the engines with RPM DELO Oil and provide fine protection for vital parts at the same time.

### Grease and Dirt Solvent Cleans Machines Easily

You can save time when preparing your machinery for storage by cleaning it with Standard Detergent. Sprayed or brushed on dirty engines, grease-caked implement axles, etc., it quickly loosens the grease and dirt so they can be flushed off with water from a hose.

### Dishmop Makes Handy Anti-rust Applicator

One good way to prevent rusting of land-polished surfaces is to coat them with a generous layer of RPM Cup Grease. It is easy to apply with an ordinary dishmop.



Before implements are put away for the season, grease cups should be cleaned and filled with RPM Cup Grease. Bearings should be flushed with Pearl Oil, adjusted and relubricated. Oil cups should be cleaned and refilled.

### Follow This Procedure

1. Drain present oil from crankcase while hot.
2. Renew filter element.
3. Fill crankcase with RPM DELO Oil.
4. Run engine at fast idle for two hours, keeping water temperature at about 200 degrees.
5. Drain while hot and fill with RPM DELO Oil.
6. Place engine in regular service and drain at one-half normal drain period, or, in the case of a truck at 750 miles, whichever comes first.
7. Drain while hot and replace oil filter if necessary.
8. Refill with RPM DELO Oil and return to regular drain and filter change periods. Continue to use RPM DELO Oil in all your Diesel engines to keep them running clean.

For every job a Standard of California performance-proved product. Ask your Standard Man for more details about these products and the many free services Standard offers you.



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## MONEY working for Wages

### CONDENSED FINANCIAL STATEMENT AS OF JUNE 30, 1946

#### ASSETS

Cash and U. S. Bonds . . .	\$1,764,393.52
Loans on Real Estate . . .	14,742,043.33
Other Loans and Real Estate Contracts	49,191.77
Other Assets and Deferred Charges . . .	171,663.80
<b>TOTAL . . .</b>	<b>\$16,727,292.42</b>

#### LIABILITIES, CAPITAL AND RESERVES

Investment Certificates . . .	\$12,465,803.16
Incomplete Loans and Other Liabilities . . .	2,507,179.64
Pledged Membership Shares	5,303.79
Capital, Surplus, and Reserves . . . . .	1,749,005.83
<b>TOTAL . . .</b>	<b>\$16,727,292.42</b>

## SOUTHERN CALIFORNIA BUILDING and LOAN ASSOCIATION

431 West Fifth Street, Los Angeles 13 • Telephone MADison 7651

Established 1887—The oldest Building and Loan Association in Los Angeles

## Azusa Packing Houses Merge Facilities

A new arrangement whereby the Azusa Foot-Hill Citrus Company will pack their fruit through the Azusa Citrus Association was announced August 15th by C.A. Griffith, president of the Foot-Hill. The packing merger will start with the 1947 navel season, according to the Azusa Herald.

This new working arrangement will bring together two of the oldest citrus packing houses in San Gabriel valley. The combination of facilities is expected to enable the local growers to more efficiently serve marketing agencies. All fruit will continue to go through the A. C. G. Fruit Exchange, which is a unit of the California Fruit Growers Exchange.

It is planned to use both the Foot-Hill and the Association packing houses, according to Griffith. Fruit will be shipped under both the Foot-Hill's well-known Red Shield label and the Association's Black Crusader Sunkist brand.

Concerning the merger of the two packing houses, Mr. C. A. Griffith, president of the Azusa Foot-Hill

Citrus Company, made the following statement:

*"Our Company is one of the oldest associations and has been, through the forty-four years of our incorporation, a loyal Exchange unit and we have done everything in our power to help the industry."*

*"This change is simply a matter of economy as I am convinced that the smaller shipper, if he does any constructive thinking, will come to the conclusion that he can no longer operate. Under the present prices you can stand the high overhead but I am looking forward to the day when competition will be keener and prices lower. Our two houses will make a very desirable sized unit and I feel, under the present management of Mr. Lentz, that we will have a very successful operation."*

Azusa's citrus history is contained in the stories of the two packing houses. The Foot-Hill house was built in 1902, the year the company was incorporated, and has packed under the Red Shield and the Green Crown brands. Original incorporators were J. S. and James Slauson, Louise S. Macneil, Kate S. Vosburg, and John T. Lindley, the latter serving as manager and president until his death in 1920.

Acquired originally in 1880 by Jonathan Slauson, the property that now comprises the Azusa Foot-Hill Citrus Company holdings has been developed into one of the southland's outstanding orange and lemon properties. A citrus pioneer interested in the development of both the Azusa houses was H. L. Macneil, who, until his death in 1901, was one of the leaders in the early years of the A. C. G. Fruit Exchange. The Foot-Hill corporation will continue to operate its extensive orchard holdings.

The Azusa Citrus Association has a modernly equipped packing house, and at one time packed all the fruit for the Foot-Hill company prior to the latter's building their own house. The Association's Black Crusader label has been a mark of quality fruit for many years, and is well known throughout the eastern auction and wholesale outlets.

T. F. Heth is president of the Azusa Citrus Association, with Alva Lentz as manager.

### Co-ops Make Fine Progress

BUSINESS VOLUME and membership of farmers' cooperative associations showed a substantial increase in the 1944-45 marketing season over the previous season, according to the Farm Credit Administration of the U.S. Department of Agriculture.

Estimated membership in the agricultural cooperatives operating in the year ended June 30, 1945, was 4,505,000, an increase of 230,000. The

4,505,000 membership did not represent that many individual farmers as some farmers had membership in more than one cooperative. Business handled by the co-ops went from \$5,160,000,000 to \$5,645,000,000, an increase of \$485 million in the year.

Business of dairy co-ops totaled \$1,294,000,000, ranking first among products handled cooperatively. Associations handling grain and beans were in second place, reaching a dollar volume of \$1,286,000,000. Fruits and vegetables were third place with \$784 million of products sold during the season.

Leading state in agricultural cooperatives is Minnesota, where 1,362 associations have a membership of 420,000. Wisconsin is second in number of associations with 1,030, but Illinois is second in membership with 411,780.

### Florida Citrus Marketing Agreement and Order Program Amended

APPROVAL of amendments to the marketing agreement and order program for Florida citrus fruit was announced August 29th by the U. S. Department of Agriculture.

Issuance of the amended marketing agreement and order follows the signing of the agreement by handlers representing approximately 65 per cent of the volume of Florida citrus fruit, and approval of the program by more than 99 per cent of the

growers who voted in the recent referendum.

The Agricultural Marketing Agreement Act of 1937, as amended, requires signature of the agreement by handlers of at least 50 per cent of the volume of fruit, and approval of the issuance of the order by at least two-thirds of the growers voting by number or by volume of fruit.

The amendments to the program become effective at 12:01 a.m., September 1. Provisions of the amendments permit the regulation of Temple oranges and pink varieties of grapefruit separately from other varieties of oranges and grapefruit. They also provide for regulations prohibiting shipments of any variety of Florida oranges, grapefruit, or tangerines for a limited time during the holiday period. Regulations suspending or prohibiting shipments are limited to not more than 14 days during the period, December 20 to January 20, of any season. Primary purpose in making possible the temporary suspension of shipments for a short time is to enable the market to absorb accumulated holiday supplies before additional shipments are brought in from the producing area.

The amendments to the marketing agreement and order program are based on the record of a two-day public hearing held at Lakeland, Fla., on March 25 and 26, 1946. This hearing was held at the request of members of the Florida citrus industry who proposed these amendments.



## FRONT ENTRANCE OF A FARMER'S FARM

THIS 142-acre farm is different.

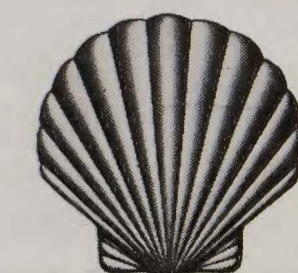
It is the new Shell Agricultural Laboratory near Modesto, California. It is now completely equipped, fully manned, and in operation.

Agricultural scientists, headed by Dr. Roy Hansberry, former entomologist at Cornell University, staff the farm. Their multiple objective is to find better ways to enrich soils, protect crops, improve quality, destroy pests.

In addition to full-size orchards, vineyards, and truck crops, the Shell "Laboratory Farm" has controlled weather rooms where any humidity or temperature condition can be made to order.

From this practical combination of research center and proving ground will come answers which all farmers are seeking. And these tested findings will be reflected in all Shell agricultural products.

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### 20 MULE TEAM BORAX

*A natural, odorless cleanser for household use—especially recommended for washing food containers and refrigerators. Wonderful as a "soap stretcher."*

### 20 MULE TEAM BORAX SOAP CHIPS

*In washing machine, tub or dishpan these extra thin flakes clean thoroughly, safely and quickly.*

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## UNUSUAL SCALE DEVELOPMENT, USE OF DDT, COMPLICATED SUMMER CONTROL PROGRAMS IN CENTRAL CALIFORNIA

**CITRICOLA** scale has shown a very unusual development this summer in central California. Weather during May and June was quite moderate and hatching of crawlers was extended past the middle of July, somewhat later than usual. Little natural mortality occurred during this period. Hatching citricola crawlers normally settle on the leaves, remaining small, clear and transparent through the summer, but in most groves this season a small percentage of the newly hatched crawlers have settled on the tender stems of the new growth and have grown rapidly, some reaching maturity and producing a second generation of crawlers by late July in occasional groves. This abnormal second generation (off-hatch) varied in extent from grove to grove, but even in the worst affected groves comprised a small percentage of the total scale population. The remainder of the scale in a grove appears for the most part to be developing normally. While this abnormal development can be found generally in groves which received various insecticide treatments, and even in untreated groves, most of the extreme cases have been found in groves heavily treated with DDT sulfur.

This development of a second generation (off-hatch) became evident in early July at which time parasites



*Metaphycus luteolus* Timb., the most effective parasite against citricola and soft brown scales. (Drawing by Harold Comper, University of California).

were already becoming active. As citricola scale grew rapidly and reached suitable size for parasite activity, *Aphycus* (*Metaphycus luteolus* Timb.) became very abundant and during July eliminated most of the "off-hatch." Another parasite, *Coccophagus lecanii* (Fitch), which commonly breeds on soft brown scale, was also active to a minor extent in destroying citricola. By the end of July, after most of the advanced scale had been parasitized, adult parasites were rapidly disappearing as the normal sized scale were still too small for parasite activity. Some additional parasite work may be expected later in the season but the extent of it is problematical. It is also of interest that this species of *Aphycus* developed in extreme abundance in groves heavily dusted with two to four applications of DDT-sulfur, both of which insecticides have been reported to be especially toxic to parasites generally. As a whole, the "off-hatch" scale has been so well eliminated as to no longer be a problem.

Citricola scale control programs of DDT-sulfur, sulfur dust and lime sulfur have all proved rather ineffective to date. Some further mortality may be expected in the late summer and early fall but many of such treated groves are now in need of scale treatment. These programs were used for a combination citricola scale and thrips control. So far as thrips are concerned, these programs have been very satisfactory, especially where DDT was used in the spring.

This is the first year that DDT combinations have been used commercially and treatments have been quite extensive. Previous experimental work indicated satisfactory results on scale as well as thrips. Some four to five hundred acres were sprayed in February and March with DDT-kerosene and DDT-oil with good results. The abnormal development of citricola scale following the hatching period of May and June as well as the moderate weather of these months

may have contributed to the poor scale control with DDT-sulfur, and sulfur dust programs.

Cottony cushion scale also shows a tendency to increase, particularly in DDT treated groves. While it is not clear yet whether this scale will become a problem because of DDT treatments, eliminating *Vedalia* ladybird beetles, this possibility should be kept in mind. Regarding the use of DDT on citrus, a joint statement of the various agencies in the field was prepared and published in the Exchange Pest Control Circular No. 134 for February, 1946, in which it was stated, "The use of DDT on citrus this year should still be considered experimental." Also, it was pointed out, "There is uncertainty regarding the possible detrimental effect of DDT treatments on parasites and predators of the cottony cushion scale, soft brown scale. . . ."

Considerable acreage has been sprayed during July and August for citricola scale with DDT and kerosene. It does appear that citricola scale can be effectively controlled with a thorough spray coverage of the proper dosage of DDT and kerosene. It is too early to determine how feasible this treatment will be on account of such complicating factors as possible "build-up" of cottony cushion scale.—From G. F. G. E. Citrus Pest Control Circular for August, 1946.

### Citrus Prospects

**T**HE citrus industry in the United States is greatly expanded from prewar levels, the U. S. Department of Agriculture reports. Production is likely to continue to increase for some time, says the Bureau of Agricultural Economics on the basis of a survey of acreage in citrus orchards and the fact that a large proportion of the trees are young and have not reached full bearing. Growers will need to continue the practice of putting a large proportion of fruit on the market in processed form, as they did during the war years.

"The full impact of possible competition between the canned orange juice and fresh oranges has not yet been felt," says the Bureau in a final paragraph of the report. "As the volume of oranges that are processed increases and as the quality of processed orange juice is improved, the effect on the volume of oranges shipped fresh will be more pronounced. But this competition should not hinder active efforts to develop acceptable canned and frozen juices and to promote their marketing. If the products are made to be thoroughly comparable with the fresh in quality, the volume of processed juices, segments, and other processed products may outstrip present sales of the fresh fruit. Emphasis in the future marketing of fresh oranges may be placed upon the better grades, wrapped in cellulose or foils, and shipped rapidly, for uses other than for juicing."

Preventable accidents take a life every five and one-half minutes, reports the National Safety Council.

# Seven Years without an Overhaul -thanks to Havoline Motor Oil

-and now Havoline does a better job than ever!  
**CLEANS** as it LUBRICATES



"I have used Havoline in this tractor and ran it 7 years without an overhaul," said Mr. C. R. Mattson, prominent farmer of near Lynden, Wash. Mr. Mattson was pleased to learn from Mr. E. A. Hofman, the smiling Texaco consignee shown in the picture, that New and Improved Havoline Motor Oil now cleans as it lubricates, releasing more power, saving fuel and doing an even better lubrication job, too.

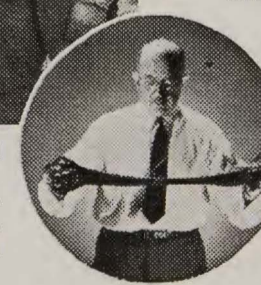
This prominent Washington farmer's experience is typical of farmers in all 48 states. Havoline for years has been a leader among quality motor oils. Now, thanks to a new and exclusive Texaco formula, New and Improved Havoline does another job for your engine in addition to superb lubrication. It keeps sooty residues of combustion from sticking to pistons and rings and robbing the engine of its power. Result: more power, more miles and more hours per gallon of fuel and better lubrication protection, too. It will pay you to change to New and Improved Havoline now.



It's a friendly, neighborly business when you deal with a Texaco Man, as this picture shows. Rex McDaniel, prominent farmer of San Luis Rey, gets a tankful of new and more powerful Fire-Chief gasoline from Texaco consignee C. J. (Tiny) Heltibridle, of Oceanside. "Dependable service is what counts most with us ranchers," says Mr. McDaniel, who farms 1,200 acres.



Mr. A. H. Jamieson, of Jamieson and Wolverton, prominent farmers of Santa Ana, Calif., receives a bucket of Marfak, the ideal lubricant for farm machinery, because it sticks to the job. It will not run out of a bearing, dry out or cake up.



**Stretch Test:** This simple test shows how Marfak lubricant clings together and adheres to bearings of tractors, trucks, cars and farm machinery.

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**"Discount on Everything But Quality"**

The following is a transcript of a portion of the Noon Farm Reporter Program, KFI, July 18, 1946, in which Mr. A. L. Chandler, field manager of the Mutual Orange Distributors, was interviewed by D. M. Rutherford, editor of the THE CITROGRAPH.

## We Need to Stress Better Fruit Quality

By A. L. CHANDLER

Why are you so much interested in the subject of QUALITY?

It seems very obvious that anyone interested in citrus growing and marketing should be keenly aware of the necessity for growing better fruit. California produces some of the best oranges, lemons, and grapefruit in the U. S. Our fruit is better looking, with bright, good colored rind free from blemishes; better eating because of its juicy pulp, high in fruit sugar and vitamins; better keeping, and noted for its freedom from decay in transit.

But all of our fruit is not of this high quality. As growers we are likely to see the defects in the fruit from

some other grove or district and overlook the troubles in our own fruit. If you could see your own fruit with the candid eye of a fruit inspector, or buyer in the East, you would, I am sure, agree that we need to stress better quality.

Just how does this fruit quality problem affect a typical grower—Mr. X—who owns 40 acres of Valencias in Mentone?

This quality factor has been of less importance in these years of high demand and regulated prices. Much of the time any good sized fruit brought ceiling prices. But I don't have to tell you of the heavy increase in citrus crops from competitive areas, as well as California,

that are in store for us in the near future. It is plain to see that soon prices will be affected by the great volume of citrus fruit offered for sale and quality fruit only will be profitable. In the future no doubt all of the lower grades will go to our processing plants and the best will be sold in fresh form. Although the processing plants will pay well on this lower grade fruit, the best fruit will pay higher prices in a free competitive market. The individual grower will realize more money if he grows top quality fruit.

You say we ought to grow better fruit—what can the individual grower do about it?

There are too many problems in

this for which we have no answers. There is need for more experimentation and research and we are happy to see that the Citrus Experiment Station is taking on these problems with renewed zeal. But there are many things now known that are not followed to the best of our ability or knowledge. This is a challenge to California citrus growers.

What do you consider the most important things to do?

Pest control is one of the most important factors in producing better fruit. It goes without saying that scaly fruit, fruit weakened by mealy bugs or injured by tortrix is off grade. The grower who keeps ahead of the pests so that his grove never gets in bad condition is well ahead of the game. But it is not alone the insects that lower the grade.

There is a close margin of safety between the insecticide that will kill one living thing—the scale—and not injure the other living thing—the tree. Inevitably there is some damage at times to the tree. Oil sprays have proven to be the most economical insecticides for most citrus pests. But, unfortunately, continued use of oil sprays has a devitalizing effect on trees.

It is important to use alternate treatments some of the time. This is especially true on navel oranges in the areas subject to water spot. That oil spray increases water spot trouble has been demonstrated beyond doubt yet growers continue to use them year after year. This means an occasional heavy loss to individual growers in loss of fruit from decay on the trees. But what is probably more important, there is too much fruit that gets by the graders in the packing houses only to cause decay in transit. This injures the reputation of the whole California industry.

What mistakes in irrigation have a bearing on fruit quality?

The calendar program of irrigating citrus trees is in my opinion the cause of much tree injury, especially in coastal areas. In many cases water is applied monthly in these areas of rather low water requirements. Some of our troubles which show up as mottled leaves, iron chlorosis, etc., are traceable to excessive water use. The key to success in irrigation is to hold off water until the soil needs it and not to wet the soil deeper than necessary. In light shallow soils applying more water than needed causes an unnecessary leaching that results in poor foliage and weakened trees. The answer is more real study of tree and soil water requirements by each farmer.

Up to now you haven't said anything about feeding the trees. I suppose the fertilizer program has an important bearing on putting good fruit on the market displays in Buffalo and Boston?

In general it is our candid belief that many growers are still too Scotch in the use of nitrogen. Under average conditions three pounds of nitrogen per tree per year, or more,

is desirable. Less than this in most cases will make good looking trees but not maximum yields. When it comes to phosphates, there is still a wide range of opinion. Experienced growers and packing house managers maintain that ammonium phosphate or other phosphate materials definitely improve quality of fruit, but scientific proof is lacking. We await with interest present increased investigations along this line. A similar condition exists in regard to the use of potash.

We have been hearing a lot about nutritional sprays lately—What about them?

Feeding of trees with zinc, manganese, copper, iron, and possibly other elements by spraying is one of the most important new developments in citriculture. It has not been completely worked out or the possibilities explored. The use of zinc sprays should be a *must* on most California groves annually. Manganese should be added in most cases. Copper is also needed in many areas but is fraught with hazard in the way of leaf burn.

Recently the use of iron materials such as ferriate and magnetite has shown results in the case of stubborn iron chlorosis or mottling. More research is indicated to develop the best formulas, time of application, etc. Early spring seems the most promising time but combination treatments with regular spray or dust applications are logical. The leaf is the indicator. If your leaves are not good sized, a dark even green, these nutritional sprays are probably needed.

It may not be exactly on the subject, but just where do we stand on the matter of citrus varieties?

There still are many acres of blood oranges, seedlings, odd varieties, etc., that from a marketing standpoint would be better budded over to standard varieties. They sell well at times and at other times do poorly and serve to complicate the sales program for standard varieties. There are also standard varieties grown in areas that are not suited to them which tend to produce low quality fruit. These trees can be interset or budded over to other varieties that will do better under the particular climatic conditions in the area. This will become more important under conditions of intense competition than it has been in recent years.



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HAVE YOU TRIED FUNGOREX  
MINOR ELEMENT SPRAYS FOR YOUR  
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IF WE TREES could talk we'd ask for FUNGOREX to make us healthier, more vigorous and more productive and since it's important food to us we'd ask for it regularly.

FUNGOREX provides just the right mixture of balanced minerals needed for your grove's condition. There are various combinations of zinc and manganese, and some grades also contain iron and copper for use where these elements are deficient.

And one of the best things about FUNGOREX is that there's no guesswork . . . no trouble . . .

no fussing with individual elements. Scientifically prepared by special precision methods, FUNGOREX comes ready for use and can be applied with LEFFINGWELL'S XXX FLOWABLE OIL EMULSIONS or POROCIDE in the regular oil spray program, thereby reducing application costs to a minimum.

Ask your Leffingwell Representative about the outstanding results growers are getting with FUNGOREX. This product may be just the thing your grove needs.

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## For BOOM SPRAYING The Largest Portable Sprayer Ever Built

Hardie again leads, with the introduction of the largest portable sprayer ever built, a sprayer specially designed for boom and mist spraying in California groves and orchards.

This great sprayer delivers 80 gpm at 1000 pounds pressure. The pump is the famous Hardie V-6, six-plunger high pressure pump.

This boom unit can be mounted on motor truck, using tank of suitable size, or it can be mounted on 8-wheel tandem frames, or caterpillar treads with 1000 or 1200 gallon tank when drawn by tractor.

Look to Hardie, as always, for custom built sprayers, nurse tanks and all special and



extraordinary requirements. Hardie owners in California enjoy the double advantage of readily accessible, complete service from strong local dealers backed by a fully equipped and stocked local Hardie factory. Write or ask for Catalog, special counsel and specification data on any sprayer you need.

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## HARVEST—of Hard Work

ONCE MORE the skill, determination, and plain hard work of the American farmer have overcome every obstacle. With the aid of a favorable season, his efforts have been rewarded with a magnificent harvest.

Now it is the task of the railroads to distribute the harvest as quickly and efficiently as possible. And because only the railroads have the capacity to carry such loads to every part of the country, over the years people have come to rely on them to accomplish such big, difficult jobs.

True, the railroads face un-

usual obstacles this year. They have not yet been able to overcome the effects of wartime service upon their car supply—especially the high-grade boxcars required for most farm products. But they have ordered many more cars, which are being built just as fast as shortages of materials and production difficulties permit.

Every available boxcar is being worked to the limit. And the same skill, ingenuity, and good old-fashioned sweat with which the railroads handled the immense wartime loads are being used to move this harvest.

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## Growing Citrus Seedlings

By J. C. JOHNSTON

*Mr. Johnston is Extension Specialist in Citriculture, Agricultural Extension Service, University of California*

IN the production of citrus seedlings, many different methods are used. Most nurserymen have worked out systems of their own, fitting the conditions under which they operate. The few instructions and suggestions that follow are offered as a basis on which to proceed. No set of rules can be given that will apply to all the citrus-growing areas. Those who are growing seedlings for the first time should be warned that the business of growing citrus nursery stock is an extremely complicated and hazardous one. Those who have succeeded in it have largely worked out for themselves the many problems peculiar to their local conditions.

### The Seeded Soil

Too much attention cannot be given to selecting the soil for growing citrus seedlings. The quality of the seedlings depends to a greater extent on the texture and fertility of the soil than on any other one factor. The best citrus seedbed soil is a well-drained sandy loam, free from gravel

and stones and at least 12 inches deep. This type of soil produces good root systems and permits digging with a minimum of root injury. In order to avoid soil-borne disease and citrus nematode, virgin soil should be selected whenever possible. If cultivated land is used, a location which has not been planted to citrus, and which has not recently been fertilized with organic materials, will ordinarily give best results.

### The Lathhouse

If large numbers of seedlings are to be grown, a lathhouse is essential. The common method of construction is to erect a frame of 4 x 4-inch posts, 8 feet high, with suitable braces. The sides and top are then covered with lath with spaces between equal to the width of the lath, so as to give half shade. For convenience the lath is usually made up in movable sections. On top of the house the lath should lie north and south. For small seedbeds a frame 4-foot high is ample. In coastal areas, this frame may be covered with cheesecloth, but in windy or hot locations lath gives better results. A 1 x 6-inch board should form the base of the frame to aid in excluding rodents and other small animals. One-inch mesh chicken wire



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is necessary in many locations, in addition to the lath or cloth, and where moles are a problem it should be extended 8 inches below the soil level.

### Sources of Seed

The rootstocks most commonly used in California are sweet orange, sour orange, Rough lemon, grapefruit, and trifoliolate orange. Certain hybrids such as Sampson tangelo are also used experimentally. The best sources of seed are vigorous old trees that have remained free from disease. Wherever possible, seed should be taken from trees known to produce vigorous uniform seedlings that make good trees when budded to the varieties that are to be grown. The better nurserymen own or have access to such trees.

### Extracting the Seed

Citrus seeds are injured by drying; it is therefore best to leave the seed in the fruit until time to plant. The usual method of extracting seed is to make a cut around the center of the fruit, using care to avoid injuring the seed. The fruit is then twisted apart, and the seeds are squeezed onto a sieve, where they may be washed free from the pulp. Various types of extractors have been used but in some cases their use causes too much damage to the seed. The number of seeds per fruit varies according to variety and growing conditions, but the average is likely to be about 15 to 20 with sweet orange, sour orange, Rough lemon, and trifoliolate orange, and about 40 to 50 with grapefruit.

### Planting the Seed

The seedbed should be carefully prepared and harrowed or raked into a very fine state of tilth. The beds should be made firm and as nearly level as possible to prevent erosion and quick runoff of irrigation water. The seedbed should be made ready before the seed is taken from the fruit, and the seed should be planted as soon as the soil warms up in the spring. As a rule, planting should be completed by the latter part of May.

One of the most serious causes of loss in citrus seedbeds is the damping-off fungus, *Rhizoctonia*, which kills the young seedlings by girdling the stem soon after they appear above ground. It can be controlled by the following method: Just before the seed is planted, aluminum sulfate should be applied to the surface of the seedbed at the rate of 1 1/4 ounce per square foot. It may be scattered over the soil and raked in, or dissolved in water and sprinkled over the beds. The aluminum sulfate produces an acid reaction in the soil, which prevents the growth of the damping-off fungus but is not injurious to the citrus seedlings.

In planting the seed, shallow furrows 2 to 3 inches apart are made by pressing a board into the soil to a depth of 1/2 inch. The seeds are placed 1 inch apart in the furrows and pressed down into the soil. Seed is sometimes planted broadcast, but better seedlings usually develop from spaced plantings. In either type of planting, the seed should be pressed

into the soil and covered to a depth of 3/4 of an inch with clean river sand, which aids in the control of disease and prevents the soil from baking. Citrus seeds germinate slowly and under most conditions will require about 30 days to come up.

### Irrigation

For large beds the most effective method of irrigation is by means of overhead sprinklers; small beds may

be watered by portable lawn sprinklers. The soil must be kept moist at all times during the growing season but should never be allowed to become soggy, or dry and baked. After the seed is planted, irrigation will be one of the most important factors determining success in growing the seedlings. Irrigation may be needed every 1 to 3 days until the seedlings are up, and every 7 to 10 days after they are well established.

### Fertilization

Citrus seedlings are less subject to disease when they are grown without fertilization. If fertilization is necessary, a chemical nitrogen carrier such as ammonium sulfate or nitrate of lime will be best. The fertilizer can be applied by dissolving it in water at the rate of one teaspoonful per gallon and distributing it over the beds with a sprinkling can at a rate not exceeding one gallon per square



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yard. This will give about 1 pound to 150 square feet. The solution may burn some of the leaves if allowed to dry, but a light sprinkling will remove the chemical before it causes injury. Organic fertilizers should not be used, because they encourage the growth of disease-producing fungi.

**Diseases**

Damping-off has always been one of the most difficult problems of the

nursery, but it can be controlled as stated above, by using aluminum sulfate.

The brown-rot fungi (Phytophthora spp.) frequently attack leaves and stems of citrus seedlings and may cause serious loss if control measures are not applied promptly. At the first sign of the disease, apply a spray of 3-3-100 bordeaux mixture—that is, 3 pounds of bluestone and 3 pounds of hydrated lime per 100 gallons of water.

**Pest Control**

The most common pests found on citrus seedlings are the citrus red mite or red spider, the citrus bud mite, citrus thrips, and aphids.

The citrus red mite is most common in the coastal and intermediate areas. It feeds on leaves and causes them to take on a gray, dry appearance. The mite is red in color and difficult to see because of its very small size. It is controlled by a spray of 1½ per cent light-medium oil. DN dust D8 will also give control, but care should be used to get a light, uniform coverage, and application during hot spells must be avoided, or the seedlings may be burned. Treatment should be applied as often as the mites are observed.

The citrus thrips are most common in the intermediate and interior areas. This is a small, light yellow, cigar-shaped insect about one thirtieth of an inch in length, which rasps the leaves as they are forming. The results are scarred, distorted leaves and retarded growth. The citrus thrips may be controlled by a spray containing 2 pounds of tarter emetic and 2 pounds of sugar per 100 gallons of water, or by using a 3 to 5 per cent DDT dust. It may be necessary to treat for thrips at frequent intervals.

Aphids of several species attack citrus seedlings. They are controlled by a spray containing 1 pint of 40 per cent nicotine sulfate and ½ lb. of calcium casinate spreader per 100

gallons of water, or by a 10 per cent nicotine sulfate dust.

**Kinds of Citrus Seedlings**

A single citrus seed will frequently produce several seedlings. One of these seedlings may grow, as most seedlings do, from a sexually produced embryo which develops as a result of pollination. This kind of seedling differs from its parents and often is too weak to become a satisfactory rootstock. One of the purposes of culling the seedbed is to eliminate these variants. The other seedlings arise more or less like buds, from the cells that surround the sack which contains the sexual embryo. This part of the seed is known technically as the nucleus and the seedlings which grow from it are called "nuclear seedlings" to distinguish them from sexually produced seedlings. Since this tissue is derived directly from the seed parent, the seedlings which grow from it are like the seed parent. They are thus uniform, and if the parent has been properly selected they will make good rootstock.

In certain citrus varieties the sexual embryo fails to develop and all or nearly all the seedlings grow from nuclear embryos and are like the seed parent. Seedlings of Rough lemon and of Sampson tangelo, for example, are nearly all like their seed parents and require a minimum of culling. Seedlings of sour orange, sweet orange, and grapefruit are extremely variable, however, and usually require heavy culling.

Citrus seedlings also differ in vigor and habit of growth. Rough lemon seedlings grow rapidly and produce uniform, upright seedlings which are easy to handle in the nursery. Sour orange, grapefruit, and trifoliolate orange seedlings are somewhat less vigorous, but they produce good, upright seedlings which are easy to handle. Sweet orange seedlings tend to produce a bushy type of growth which is not convenient for the nurseryman. Seedlings of Sampson tangelo are slower to develop and are more bushy than sweet orange; they are difficult to transplant and do not usually reach budding size as quickly as other stocks.

**Digging the Seedlings**

Citrus seedlings are ready to transplant when they are 6 to 8 inches high. Well-grown seedlings will reach this size 6 to 12 months after the seed is planted. Before digging begins, the soil should be thoroughly wet to a depth of 18 inches, so that the seedlings may be loosened with a long-tined spading fork and removed from the soil with a minimum of root injury.

All seedlings having crooked or deformed roots, and those which are small, of type, or diseased, should be discarded. For convenience they may be tied in bunches, and tops which are longer than 8 inches may be chopped off. Seedlings that are to be shipped or held in storage several days should be packed in bags or boxes with the roots in damp sphagnum moss, but it is best to plant at once. The roots should be covered at all times and never exposed to the sun or allowed to become dry. Seedlings should not be kept in water after they are dug. This practice frequently causes the seedlings to die after they have been planted.

**River Stabilizers for Orange County**

CONSTRUCTION of two additional stabilizers on the Santa Ana River near Olive, to supplement the three previously built, was started September 1 by the Directors of the Orange County Water District. Structures of this character built in this area help to spread the water over the entire width of the channel and aid in replenishing the water in the entire basin. It is estimated that approximately \$3,000 will be spent on each one. Completion will be obtained before the forthcoming rainy season. Construction of the Prado Dam and control of the flow of water has made this type of structure possible in the river.

The stabilizer is built of rolled and tamped clay and protected with a covering coat of black top asphalt, and is placed level across the flood channel. Packed clay extends three feet below the surface and is approximately eight feet wide at the top. It is invisible most of the time, concealed by river sand.

The primary purpose of a "Stabilizer" is to spread the low flow of the river over the full width of the

channel and thus "stabilize" the river and prevent channels being cut. It is thus that the maximum percolation and recharge in the forebay or intake area of the water basin of Orange County is obtained. Within their area of influence the present stabilizers spread the river satisfactorily. The objective of the two new ones is to extend the benefit further down stream and thus sink more water into the main basin.

As far as is known, this is the only project in the United States where spreading is accomplished by such stabilizers in the main channel. The method has been developed over the past ten years by the Directors of the Orange County Water District. Current experimental work under the supervision of Directors Ralph J. McFaden, E. T. Watson, and John W. Crill supplements prior and early work by Wm. Hauerhan, V. C. Heil,

C. E. Smith, D. R. Gardner, and others. During the entire period Paul Bailey has been consulting engineer for the directors.

Conservation of the nation's food supply will be aided through a superior chemical seed-disinfectant which, without supplemental insecticides, also controls insects that attack seed in storage.



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This unit is identical to that used on the MASTER WEED SPRAYER and has been used throughout the horticultural districts of California for over five years.

Accessory equipment for use with the stationary WEED SPRAYING UNIT such as: standard spray guns, hose spray equipment, Monarch Fan Spray nozzles, as used on the MASTER WEED SPRAYER, can be furnished. Also by-pass valves, pressure gauges, spray gun valves, filters, pipe and fittings and other accessories are available.

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**TIDE WATER ASSOCIATED OIL COMPANY**

**TWO HEARINGS** convened in the fall of 1945 upon the invitation of Dean C. B. Hutchison to review the research program of the University of California Agricultural Experiment Station. The first one held in Davis was generally attended by farmers representing the interests of general farm crops, deciduous fruit, vegetable crops, grapes, and the various livestock interests. The second one held in Riverside was attended primarily by those interested in the fruit growing industries in southern California. Much good resulted in the exchange of ideas between the fruit growers on one hand and the research

### RESEARCH IN UNIVERSITY OF CALIFORNIA AIDED BY CITRUS INDUSTRY

By L. D. BATCHELOR

men on the other. One phase of the work at the Citrus Experiment Station which the staff has long since felt was inadequate and which the growers expressed a desire to see enlarged, was a more extensive and complete study of the newer insecticides in an attempt to find some practical way to reduce the use of oil sprays on both

orange and lemon trees. The research in the experiment station, which has also been confirmed by many people in the citrus industry, has shown that the use of oil sprays has in many cases caused injury to the trees and the quality of the fruit produced.

In view of the many, and diverse research projects which the Experi-

ment Station must work on, and that added funds would not be available to enlarge the insecticide work before July 1st, 1946, there was a discussion of the possibility of the citrus industry aided in financing an enlarged program of research. Several meetings were held with committees of the California Fruit Growers Exchange and estimates were submitted to cover the costs of an adequate research program. If the laboratory, and field trials were to be carried out in harmony with the importance of this problem it was estimated by Dr. A. M. Boyce that it would take \$16,000 in addition to the regular University budget to finance the work from January 1st to June 30th, 1946.

The Exchange officials agreed to sponsor a grant for this amount and to invite other marketing agencies to participate in proportion to the amounts of fruit handled. All concerned supported this grant and the \$16,000 became available as rapidly as needed during the first six months of this year. In the meantime plans were made to finance this enlarged research program by experiment station funds after July 1st if it were practical to do so.

The special meeting of the state legislature appropriated a fund to increase the research work throughout the California Experiment Station during the present fiscal year beginning July 1st. From this fund we have been able to continue this projected study on insecticides as originally planned and enlarged. We express our appreciation to the citrus industry for their encouragement on every hand, and tangible assistance in carrying out this work.

### School Lunches Averaged \$18 a Year

**A REPORT** by the U. S. Department of Agriculture on community school lunch programs for 1945 records that 6,655,458 pupils in 43,480 schools participated. The Federal contributions amounted to \$47,844,000 and the funds contributed by states and localities are estimated to have been the equivalent of about \$76,000,000, or an average of more than \$1.50 for each federal dollar. This averages about \$7 per pupil a year in federal funds and about \$11 per pupil furnished by states and localities. Under the newly enacted School Lunch Act the states are required at the outset to share 50-50 in the support of the program, although service and equipment in lieu of cash may represent the state's share. In 1945, on the average, the local funds more than "matched" the federal aid.

The five states that led in the number of pupils enrolled in the community school lunch program in 1945 were: New York, 537,639 pupils receiving \$3,048,000 aid from the U. S. Department of Agriculture; South Carolina, 386,593 pupils and \$2,320,000 aid; Texas, 375,200 pupils and \$3,141,000 aid; Georgia, 342,379 pupils and \$2,565,000 aid; and Illinois with 336,000 pupils and \$2,504,000 aid from the federal funds.



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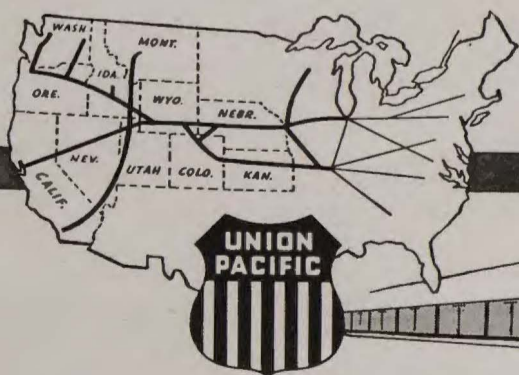
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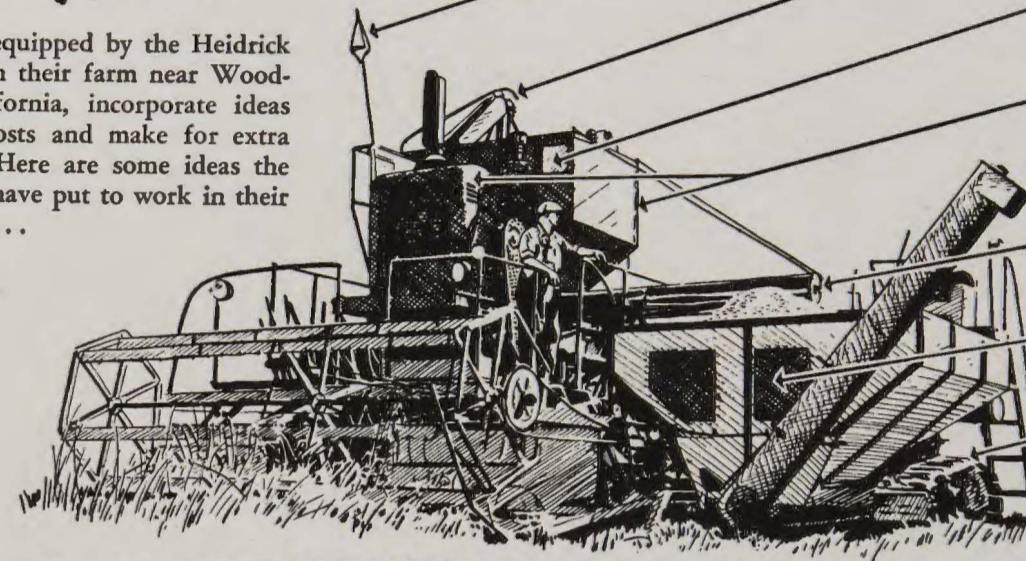
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- Flag operated from driver's seat signals bank-out rig when combine is ready to unload bin
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- Extra large 12-inch pipe with built-in screw conveyor speeds unloading of bulk grain tank into bank-out rig
- Screen windows in front of bank-out rig aid driver at rear to avoid obstacles when driving to combine before tank has filled
- Tracks equip bank-out rig to operate over any kind of ground, in any weather
- Double sickles without fingers (not visible here) keep sickles from jamming in heavy weedy going

### Ideas from a neighbor's farm

Safeway's Farm Reporter keeps tab on how farmers make work easier, cut operating costs, improve crop quality. Safeway reports (not necessarily endorses) his findings because we Safeway people know that exchanging good ideas helps everybody. After all, more than a third of our customers are farm folks.



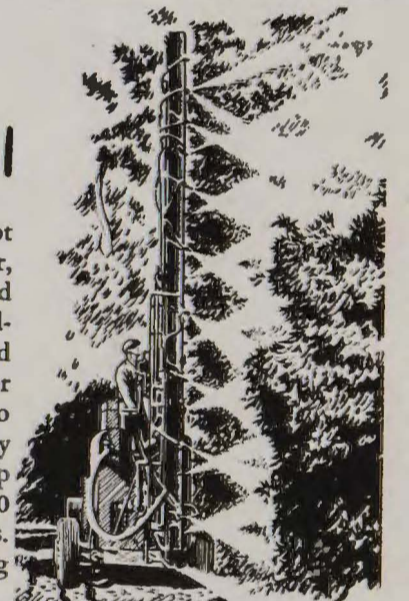
### Homemade Machine Builds Terraces — Stops Soil Erosion

Instead of buying or renting road machinery to terrace his Texas farm land, J. E. Hancock of Lubbock built the original terracing machine you see in action here. The Texas A. and M. College Extension Service is interested in it.

Pulled by tractor around contour of field, this machine throws a continuous stream of dirt to build terraces. Mechanism consists of the scoop and elevator portions of a potato digger hooked up with a cross conveyor belt. These units are powered by an auto engine mounted above and to one side of the elevator. Dirt is scooped up, loaded aboard the machine, then fed off to side by conveyor.

### Getting up in the world Pays off in Pest Control

This new boom sprayer for fighting scale and brown rot in California citrus orchards has a 22-foot main tower, maximum capacity of 140 gallons per minute. Developed by K. W. Loucks, of Yorba Linda, the sprayer is hand-regulated to various tree heights by an operator stationed at the boom. Cut-off valves control nozzles on the upper part of the boom. 22 "guns" spaced at 16 inches in two series set at different angles, are operated simultaneously by a small motor. For supplemental coverage in close-up work, an independent 12-foot stationary upright with 10 nozzles is provided. Pressure is maintained at 500 pounds. The sprayer gives intensive tree coverage while moving at about 1 to 1 1/2 miles an hour.



### A Modern Safeway idea is on-the-ground buying



Safeway divisions which buy farm produce for Safeway stores maintain offices all through the areas where the produce is grown. In local telephone directories these Safeway buying divisions are listed as "Easwest Produce Company."

Each Safeway buying division specializes in buying certain specific kinds of farm produce. So Safeway men are able to keep close in touch with local growing conditions on each crop, and they know local grower problems. Safeway buyers do not collect or accept commissions, allowances or brokerage fees. They pay the going price or better, never offer a price lower than a producer quotes.

- Safeway buys direct, sells direct, to cut "in-between" costs
- Safeway buys regularly, offering producers a steady market; when purchasing from farmers Safeway accepts no brokerage directly or indirectly
- Safeway pays going prices or better, never offers a price lower than producer quotes
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### Telephone service coming up for your farm

In some places, we've already caught up with waiting lists for service. But in others poles must be set, wires strung, and more switchboards and other equipment secured before all demands for telephone service can be filled.

The extension and improvement of rural telephone service is an important part of our five-year, \$180,000,000 expansion program. The job is in full swing and we want you to know that we are doing everything possible to hurry it along.

**Southern California Telephone Company**



### "And Then I Nearly Fainted," said H.B.

DOWN Coachella Valley Way farm folks are reputed to do things bigger and better and usually different. That we now believe.

This report has nothing to do with ripe valencias in February, Thompson grapes a month ahead of other sections or succulent sweet corn ready for your butter and salt before it is planted in most other places—all of which are different. None of this. Our report has to do with one of the most heart-warming evidences of community good neighborliness we have heard in a long time.

The story goes back some years when H. B. Richardson, assistant county agent of Riverside County, a member of the staff of the Agricultural Extension Service of the University of California, became interested in some of the problems of desert agriculture. There were various production problems—bud beetles of grapes, special problems in production of early tomatoes and other winter-grown truck crops, quality and insect problems of sweet corn. The date industry had a special set of headaches of its own, likewise the local grapefruit industry. Richardson enlisted cooperation of growers and various research men and set about to see what could be done with test plots, surveys, trial use of new methods, special investigations and whatever else was needed. In so many instances the answer could be gotten only from the field. And some very satisfactory progress was made. Richardson and the local folks got to know each other well and favorably through their common interests and working together. And several busy years, as they have a way of doing, passed in a hurry.

Richardson, having been out of college for sufficient time not to take formal education seriously, and having been digging around in earthy problems long enough to be aware of

how much more he would like to know, decided to take a year off for advanced study. The University has a provision for staff members taking one year off in seven for professional improvements—at somewhat reduced salary in the interim.

Local people got wind of the fact that Richardson was to leave on September 1, to spend a year at Cornell—that would be helpful to him in being of help to them—and they thought it was a mighty good idea. So they decided it called for a send-off party. Those folks down that way have know-how in such matters.

Local men, including Jim Easley, Joe Snyder, M. C. McDonald, Bob Bowlin, Ted Carlson, did a little unofficial telephoning and arrangement-making. And Mr. and Mrs. H. B. Richardson were told they had better show up at the appointed time, or else. They showed up.

The dinner went along with the customary good eating and easy-going chatter. Then somebody made a speech—strictly not of the starchy kind. Mrs. Richardson was presented with a very fine matched set of traveling bags—the kind your wife has been wanting for years. More dinner and informal program. Then it was suggested that H. B. Richardson should not be forgotten in the proceedings and he was presented with a handbag that must have been brought to the Valley in the first prairie schooner. It was in a bad state of repair, very bad, tied up with old rope. It contained a pair of weather-beaten gopher traps. Everybody whooped it up.

Then more program, as we said, without starch. Then another speech. The spokesman said, "We farmers are establishing the *Coachella Valley Farmer's Scholarship Fund*." And H. B. Richardson was handed an envelope containing a check. We assume it would be indelicate to quote the figure we saw on the check, but we did observe that it could not be written with three figures. This check was to be used to help with expenses for a year at Cornell.

Richardson, ordinarily very handy with verbiage, was completely without words. We asked what he said, and he replied, "I dunno. I was given the check. I looked at it. And then I nearly fainted."

Now when a public servant is so honored it is a mighty fine tribute both to him and to those he works for. Looks is if the local good neighbor policy is in very good order. But don't go away folks, there's more.

The local committee had no trouble in collecting the funds they needed. Just a matter of telephone calls. So there's a second clause and a second check, in the scholarship instructions: When the work at Cornell is completed Richardson is to spend three months in the East and South Coast sections studying crop production methods and is to wind up in Florida to learn what's what in local ways and means of citrus production.

### Citrus Overproduction Predicted by Government

A potential surplus of citrus fruit and fruit products resulting from the wartime expansion of the citrus industry, may force growers to look for new civilian outlets within the next few years, according to a special report of USDA.

Pointing out that further "substantial increases" in Florida and Texas citrus output, as well as in the production of foreign nations, can be expected, the report declares that "historic supply-price relationships indicate an eventual downward trend in prices to citrus growers."

### Fertilizer Offsets 2,4-D Check

Homeowners who are planning to use one of the several 2,4-D weed killer spray preparations now on the market to rid lawns of such troublesome weeds as dandelions or narrow-leaved plantains may expect that the growth of the grass will be checked somewhat following the spraying.

The grasses recover, however, and in really weedy lawns the elimination of the weed competition favors better growth of grass. The result is that after about a month the effect of the weed-killing chemical wears off and the growth of the grass gains.

Experiments last year by U. S. Department of Agriculture investigators showed good results from fertilizing

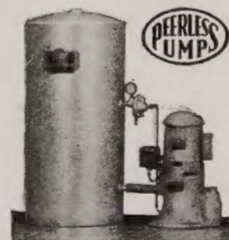
weedy lawns with a nitrogen fertilizer, urea, 60 lbs. per acre. The two chemicals did not interact and injure each other, and the fertilization did not preserve the weeds or encourage their growth. Instead, the urea acted on the grass and stimulated growth so that the check caused by the 2, 4-D was less objectionable.

Homeowners who buy commercial 2, 4-D preparations should follow the directions for dilution recommended by the manufacturers, and then add the urea required. An application of 60 pounds to the acre is approximately at the rate of 1 1/4 pounds of urea to 1000 square feet of lawn. This, the investigators warn, is about the safe limit for strength of urea, since in the tests a spray with urea at the rate of 90 pounds to the acre burned the grass severely.

At this writing oranges are the only fresh fruit remaining under ceiling price control.

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### VIGIL AND VIGOR VANISH VEXATIOUS VARMINT!

By E. M. BECKER

Mr. Becker is Deputy Agricultural Commissioner of Los Angeles County, Specializing in Weed and Rodent Control

gopher is working more actively and his burrows are most easily located; also you eliminate the adults before the families arrive.

#### Poison

DO you know the name of the rodent who is Enemy No. 1 to the citrus grower as well as all other farmers in Southern California?

The answer to this \$64.00 question is the gopher, but we'll settle for \$1.25, because you'll need the rest of the money to fight that energetic little beast, the pocket gopher.

You can afford to feed a pet elephant in your back yard better than to have one of these buck-teethed individuals at large in your grove and, the irony of it all is that the gopher is working hardest at his devilish task while you are sound asleep.

Most farmers realize the menace this rodent represents, but too few of them will take the time to learn the best methods which can be used for its control. Whether you own an acre or a hundred acres, if there is one gopher on your property, he will be a thorn in your side until destroyed.

Gophers live on the roots and vegetation of most plants and trees, so you are sure to have something on your property which they will attack.

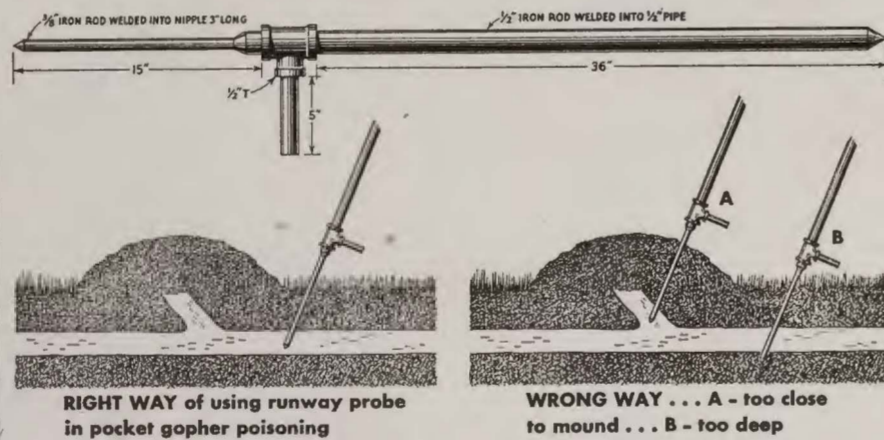
The best time to carry on gopher control is after the first rains in the fall of the year up to the middle of February. During this period, the

best control method which can be used is poisoning. Sweet potatoes, carrots or parsnips cut two inches long and one-half inch square at the ends are the best baits. Dust over three quarts of the cut bait one-eighth ounce of powdered strychnine alkaloid. Place two baits at different places in each burrow system. A burrow system consists of a separate group of mounds which are connected by a main runway. A short lateral burrow runs from the main runway to each mound and is used by the gopher to get rid of the dirt excavated in digging the main runway. Both the baits or traps should always be placed in the main runway, not the lateral burrow, as the gopher uses the main runway continually but may not go into the lateral burrow after it is no longer needed for removing dirt.

#### Use Probe

The use of a probe is a great help in locating gopher burrows and in placing the poisoned baits. An efficient gopher probe can be made as follows: Take a 36" length of 1/2" pipe. Weld a plug in one end and

(Continued on Page 496)



CAUTION: ALL POISON CONTAINERS AND ALL UTENSILS USED IN THE PREPARATION OF POISONS SHOULD BE KEPT PLAINLY LABELED AND OUT OF REACH OF IRRESPONSIBLE PERSONS & LIVESTOCK

Pocket gophers are readily caught with various makes of special traps that can be bought at hardware and seed stores. A few of these traps properly handled will keep small areas free of the pests. For ridding alfalfa fields, orchards and long stretches of ditch embankment of gophers a very successful and much more practical method is to poison them by use of baits placed in their underground runways.

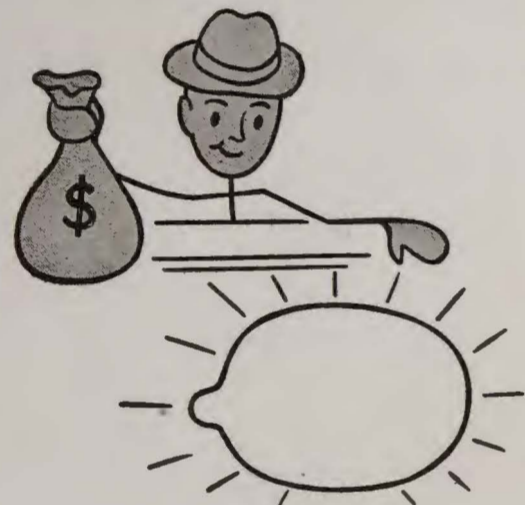
Recommended baits are sweet potatoes, parsnips or carrots. To prepare, cut into pieces 2" long and 1/2 inch square, then wash and drain. Dust over 2 qts. of these dampened baits 1/2 ounce of strychnine alkaloid (powdered) from a sifter (pepper box). Stir thoroughly at the same time to distribute the poison evenly. The prepared poison may be purchased from this office at cost. Baits need be placed only at two points in each separate system of 5 to 10 mounds, which is usually the home of a single gopher.

The runways, which are usually 4 to 8 inches beneath the surface, can be located by means of a probe made of any strong handle an inch in diameter and 36 inches long. One end should be bluntly pointed. Into the other should be fitted a piece of 1/2 inch iron rod, protruding about 15 inches, also bluntly pointed. A foot rest aids in probing hard soils. By forcing down the iron rod near gopher workings, by a foot or two back of fresh mounds, the open tunnel can be felt as the point breaks into it. The blunt end of the instrument is then used carefully to enlarge the hole, a bait or two is dropped into the run, and the probe hole is closed.



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Action ride—and, above all, the Big-Car performance and dependability of its famous valve-in-head Thrift-Master engine... because this is America's most thoroughly proved automotive power plant, with the longest, strongest record of performance—in the hands of the largest number of owners—of any car engine built today!

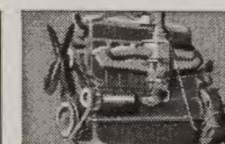
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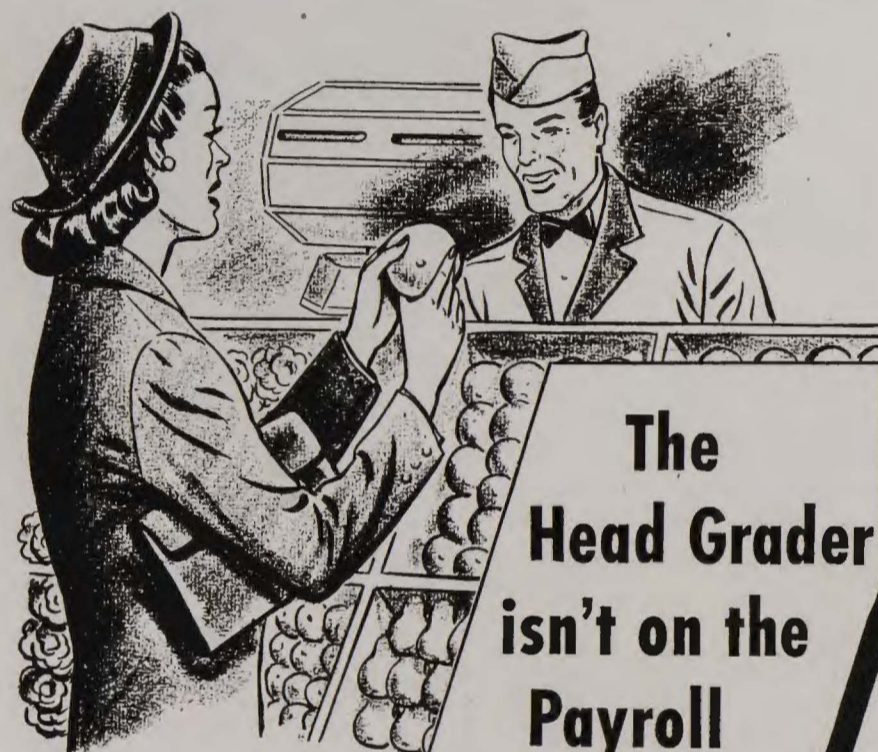
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**Vexatious Varmint**

(Continued from Page 494)

sharpen it moderately. Thread the opposite end and screw on a tee. Into the opening of the tee parallel to the 1/2" pipe weld a 3/8" iron rod 15" in length. Into the opening of the tee at right angles to the 1/2" pipe screw in a 5" nipple. In using the probe, the 1/2" pipe is held with both hands near the top. The 5" nipple is used for a foot rest to help force the probe into the ground. Where the ground is soft, the foot rest is not needed.

Start probing on the side of the mound where the last dirt has been thrown out by the gopher. This is usually indicated by the formation of a small cone of earth that has been pushed up by the gopher as he closed the opening to the lateral burrow. Probe several inches away from the mound so that when the burrow is located it will be the main runway and not the lateral. As the probe drops into the burrow the operator will feel a definite "give" to the probe. It will take a little practice before one can have perfect confidence in locating burrows with the probe, but once that "touch" has been acquired, very few baits will be misplaced. After the burrow is located with the point of the probe, the ends of the probe are reversed and the probe hole is enlarged. The bait is then dropped through the hole and falls into the gopher runway. The diagram shows proper and improper use of the probe.

After the bait is placed, the hole is pushed shut with the heel of the shoe. Gophers are less suspicious of baits placed with a probe than those put into the burrows which have been dug into with a shovel as the probe method does not disturb the burrow. Government experts estimate 30% greater efficiency is gained through the use of a probe.

**Traps**

Where wire traps are used, two traps should be set in the main runway facing the opposite directions. Each trap should be placed well back in the burrow and pressed firmly into the earth so that they will not move as the gopher crawls over the jaws before reaching the trigger. Any

movement of the trap may frighten the gopher and cause him to return pushing a load of dirt ahead of him, thus plugging the burrow and springing the trap.

Many trappers prefer the box type trap. These traps are often effective when set in the lateral burrow as they have a small hole at the back of the trap which lets light into the burrow. Gophers are drawn into the lateral burrows from the main runway to investigate the reason for this light and thus spring the trap and are caught. Usually however, it is safer to use two of the box traps facing in opposite directions in the main runway. As is the case with wire traps, box traps should be firmly pressed into the earth so as not to move if touched by the gopher before he reaches the trigger.

**Gas**

Gassing gopher burrows is usually ineffective as the gas is dissipated in the porous soils so rapidly that it seldom reaches the gopher in sufficient concentration to effect a kill. Carbon bisulphide when used in a gun and pumped into the burrows under pressure has given good results in areas where the ground contains sufficient moisture to confine the gas. These conditions are usually found in alfalfa fields but seldom exist in orchards. Where gassing is attempted, it should be done in January, February and early March while the young gophers are in the nests or still occupying the family burrow.

Too much importance cannot be given to gopher control as one of these rodents can, within a single day, girdle an orchard tree which it has taken twenty or more years to raise.

Usually the most dangerous period for damage to orchard trees is in the early spring and summer months when many of the orchards are free of other vegetation on which the gopher feeds. As soon as the food is eliminated through discing or plowing under of cover crops, the gopher must either move in search of a new food supply or start feeding on the roots of trees. His choice in most cases will be the roots of trees and if he is not detected and destroyed

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several trees may be lost within a short period of time.

Cooperation by a number of property owners so that intensive gopher control can be done simultaneously over a large area will give the best results as this prevents a rapid reinfestation from adjacent properties.

Gophers can be controlled and their damage to agriculture halted, but it takes vigorous action and constant vigil to accomplish this task.

the squirrel labyrinth; a subsoil plow might be economically used in land yielding high value crops. He believes much can be done in wrecking these rodent tunnels by use of explosives, being careful not to damage fences, trees, bridges, etc. He recommends a careful study of the use of explosives for this purpose, perhaps using former military personnel already familiar with their handling.

**Debt Dwindles**

U. S. farmers are rapidly acquiring ownership of their own cooperative credit system.

C. R. Arnold, production credit commissioner of the Farm Credit Administration, announced last month that federal capital in the nation's 506 production credit associations had been reduced by an additional \$7,050,000 returned to the revolving fund of the United States Treasury.

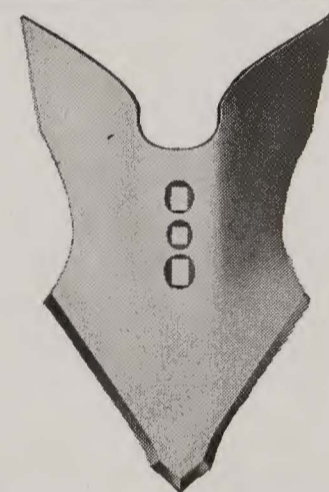
In three successive annual payments, Arnold said, a total of \$18,750,000 has been funneled back to the federal coffers.

Capital in production credit associations now owned by their 370,000 members now exceeds \$34,000,000, which, added to \$36,000,000 in accumulated earnings, represents 58.7 percent of their total worth.

**Wreck Ground Squirrel Burrows**

**K**ILLING the inhabitant of a ground squirrel burrow and leaving its tunnels intact, invites new residents and may continue the damage done by the rodents, says Dr. T. I. Storer, professor of zoology on the Davis campus of the University of California. Further, he points out, some "colonial" burrows have several hundred feet of tunnels and may accommodate seven or eight squirrels at one time.

Hence Dr. Storer recommends the destruction of the underground homes of these crop pests. In gardens a chisel reaching down 12 to 18 inches would destroy a large percentage of



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Experience gained through many years in the manufacture of heat-treated, spring-steel, and the knowledge acquired of its inherent wearing qualities, prompted U. S. Spring and Bumper Co. to apply the same methods and principles to the manufacture of farm tools. Heat-treated, spring-steel is used exclusively in the manu-

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**Broadening Farm Markets**  
*(Continued from Page 462)*

mark, and in addition, glass manufacturers generally have participated in the market.

Time does not permit relating the very interesting silverware premium program which started in 1910 and at one time made the California Fruit Growers Exchange the largest retail handler of silverware in the entire world. This program had much to do with making "Sunkist" a familiar trademark.

These are but examples of merchandising that occurs between the point where distribution to wholesalers and retailers ends and the American jury of housewives takes over. I have talked about Sunkist, which we like to consider typical of American ingenuity in market development.

*Don't learn the traffic rules by accident, says the National Safety Council.*

**Lemon Men Meet**  
**October 9th**

The first meeting of the season for the members of the Lemon Men's Club will be held Wednesday, October 9th, at 1:30 P.M. at the Sun-kist Building, 707 West Fifth St., Los Angeles.

The following excellent program has been arranged:

Propagation of Citrus Fruit Trees, including Source of Seed, Methods, Care of Seedlings, etc., by Dr. S. H. Cameron, associate professor of Sub-tropical Horticulture, University of California, Los Angeles.

Management of a Ranch Nursery, by Paul W. Moore, superintendent of the Azusa Foot-Hill Ranch, Azusa.

Long Range Weather Forecasting, by Floyd D. Young, Regional Director, United States Weather Bureau.

All who are interested in the subjects to be discussed are cordially invited to attend the meeting.



*A fine stand of oats and vetch, late planted, in the orchard of John Goburges, West Riverside, Calif. Might have been better to turn under before reaching this stage of growth.*

**Don't Delay Planting**  
**Cover Crops**

**N**OW IS THE TIME for planting cover crops. Such green mature crops planted in September make more tonnage than those planted after the first of October. The biggest difficulty is to keep them properly irrigated. This is the main problem confronting the grower who plants cover crops early.

A mixture of purple vetch and oats is a very satisfactory combination. Where the soil is sandy and tends to blow, winter rye is suggested. Where

the soils have been eroded off, and especially where fertility is low, it is recommended that a top dressing of about two to three hundred pounds sulfate of ammonia, or equivalent amount of nitrogen, be broadcast on the surface immediately after seeding, and repeated at any time later when the cover crop begins to slow up and turns yellow. Nitrogen will not materially help vetch or melilotus, but will give mustard and the cereals a good boost. If phosphorous has been used in the fertilizer program, generally better growth will result from the purple vetch.

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It is recommended that a combination of twenty-five pounds purple vetch and fifteen pounds oats be planted per acre; first, by working up the soil into a good seed bed, drilling or harrowing in the oats and vetch seed, and then furrowing out.

Where it is desired to use mustard, Brassica alba (hollow stem) or Brassica nigra, cultivated (solid stem) may be broadcast after furrowing out, at the rate of ten to twelve pounds, or eight to ten pounds, respectively. The hollow stem mustard will not stand orchard heating operations or tramping through the orchard, as will the solid stem black mustard.

Generally, however, the vetch-oats combination is preferred.—Ralph G. LaRue, Assistant Farm Advisor, San Bernardino County.

shelter up so that the thermometer was exposed to full radiation direct to the sky and even though every heater was going wide open, his thermometer was going down. We dropped the shelter lid down, the thermometer almost blew out the top, and he turned out all his heaters.

A six-inch board, with a four-inch cap under which the thermometer can be mounted five feet above ground, is thoroughly adequate, providing the thermometer is faced north and placed as far away from any heater as possible.

It pays to know how cold it is and how long it has been cold, with good thermometers, for efficient operation practice.

**Fertilization:**

We are having many inquiries regarding fall applications of fertilizer. Our recommendation for many years, which is still sound, is that if manure is to be used in the fertilizer program, the best time to put it on is in the fall. On the other hand, a number of very good growers in this county consider that any time is the best time to put manure on, providing it is cheap enough.

If the other half of the nitrogen is to be put on in the form of concentrates, it is suggested that on the heavier soils it may be put on any time after the first or middle of October. If a cover crop is being grown,

it would be desirable to broadcast half of it on the cover crop at this time and the other half as the cover crop is disced under in the spring.—Ralph G. La Rue, Agricultural Extension Service, San Bernardino.

**Irrigate Young Citrus**  
**Trees**

**Y**OUNG citrus trees planted this spring need water more often than old trees, says A. G. Salter, Farm Advisor of San Bernardino County. Late summer and early fall weather is usually the driest weather of the year. The root system of young trees is small and, therefore, frequent irrigation is necessary. In many cases two to three irrigations per month is required.

It is also good practice to feed the trees some nitrogen fertilizer with each irrigation. Two tablespoons of sulphate of ammonia to ten gallons of water is recommended. More than this amount is dangerous. The young feeder roots may become burned.

*"Is life so dear, or peace so sweet as to be purchased at the price of chains and slavery? Forbid it, Almighty God! I know not what course others may take; but as for me, give me liberty or give me death."*

Patrick Henry, Richmond, 1775

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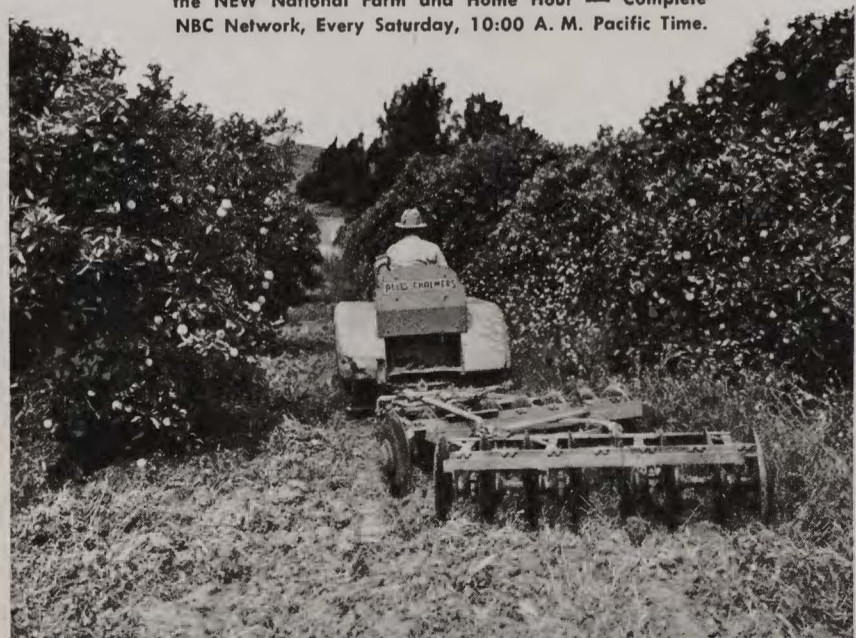
Better feeding of the trees and better use of irrigation water is a fast developing science in citrus-land. One phase of this is improved cover crop tillage. In many groves the surface is left somewhat rough or trashy. Penetration is just deep enough to leave the top few inches loose and loaded with humus.

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## The CITRUS GROWER'S QUESTION BOX

By J. C. Johnston, Extension Specialist in Citriculture, University of California

★  
Readers are invited to send in their questions on cultural problems.

*Q. What does a soil analysis cost and to whom could you go for a reliable test? Would it not be a good idea for the State to set up a station for such tests?*

A. A soil analysis may be a very simple test or it may involve a series of complicated procedures according to the purpose. For this reason it is not possible to say what the cost should be but an adequate analysis would be very expensive.

There are reliable agricultural laboratories in most districts and your farm advisor will be able to direct you to one that serves your locality.

I do not believe it would be wise for the State to provide this sort of service. It would involve considerable public expense and the results would be difficult to interpret after they were obtained. Soil analysis is a necessary tool in the study of soil problems, but the results can be relied on only when

they have been carefully correlated with plant responses, using the kind of soil to be tested and the crops which are to be grown.

In areas where there are large bodies of soil of the same type and where only a few crops are grown, this is not a difficult problem. But in California, where there are several hundred soil series, each consisting of a number of soil types and where there are some 200 commercial crops, it has not been possible to establish such correlations.

The complexity and variability of a single soil type present great obstacles. The soil is made up of mineral particles; organic materials in various stages of decay; living things, such as bacteria, fungi, protozoans, worms, insects, and plants; water; and oxygen and other gases. The balance between these constituents and the form in which the plant nutrients occur may be more important from the standpoint of plant growth than the total amounts of the nutrients as shown in a chemical analysis. Furthermore, all of the constituents vary considerably within short distances.

At no two points in a field is the soil exactly the same, and at any given point it differs at different depths. To complicate the situation, samples taken at a given point at different times may show considerable difference. The securing of a representative sample is thus a task for an expert. Yet unless a truly representative sample is obtained, the analysis will mean nothing.

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Because of the complexity of soil problems a local chemist can serve you more intelligently than one located at a distance as would be necessary if a State laboratory were established.

Those who wish to help with soil problems may consult their county farm advisor, the local representative of the College of Agriculture. He is well qualified to handle problems of soil fertility and crop adaptation. He is familiar with the soil and crop problems of his county and has access to specialists of the University of California and the United States Department of Agriculture if new or unusual problems are encountered.—J.C.J.

*Q. In setting out a new lemon grove on a hillside where the slope varies from less than 10% to about 30%, how much drop should I allow from one tree to another planting on a contour, with permanent furrows and a non-cultivation, oil spray program?*

A. We find that a 1½ per cent grade allows a good flow of water for contour plantings where the length of run is not over 200 to 300 ft. long on loam or heavier soils. A one per cent grade is better where the

furrows are—say 100 to 150 feet long. The length of runs will probably vary considerably where the slope of the hill ranges from 10 per cent to 30 per cent.

In other words, the drop from tree to tree should be more gradual for short runs than for long runs in order to allow more time for penetration of water.

Furthermore, heavy soils will take lesser grades than lighter soils. The range of grades, therefore, taking length of run and type of soil into consideration, will vary from 1 foot per hundred to 2 feet per hundred.—Harold E. Wahlberg.

*Q. What amount of water would a mature lemon orchard in the coastal area of Santa Barbara require?*

A. A good thrifty mature lemon orchard in the coastal area of Santa Barbara County will require about 11-acre inches of irrigation water per year. The amount actually used by the growers ranges between 2 and 24-acre inches per acre per year. This amount is applied in one to five irrigations. The majority of growers apply approximately 3-acre inches per acre in four applications.—F. A. White.

## Orchard Heating

Now is the time to check your orchard heaters. Several trees have been noticed in the county where the trunk was saturated by oil, where the heater was placed too close to the trunk and siphoning over the edge or leakage, was resulting in probable death of the tree. This siphoning is very hazardous, and at least a foot should be allowed between the edge of a pot and the trunk of the tree.

Leaky pots should be removed and the oil-soaked ground scraped away from the trunk of the tree and clean soil replaced.

Such inspections give you a chance to replace necessary heaters before the fall rush begins.—Ralph LaRue.

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## ORCHARDS THRIVE ON LEGUMES

A good legume or grass-legume cover crop in the orchard does three things: 1—Prevents erosion, 2—Supplies organic matter, 3—Grows nitrogen. Legumes are heavy feeders on potash. Make sure in fertilizing your cover crop that you apply enough of this plant food to provide for a heavy stand and vigorous growth of legumes. In this way the trees will get potash, which they use in amounts about equal to nitrogen.

Consult your agricultural adviser about the fertility of your soils. Then see your dealer about a fertilizer that will supply enough potash to supplement what your soil will make available.

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# ★ The Home Page ★

## Sour Milk Corn Muffins

Sweet milk soured with lemon, may be used exactly like natural sour milk or buttermilk in any baking soda recipe. Place 1½ tablespoons lemon juice in a standard measuring cup. Fill to 1-cup mark with fresh, sweet milk or diluted evaporated milk.

- 1 cup corn meal
- 1 cup bread flour
- 2 tablespoons sugar
- 1½ teaspoons salt
- ½ teaspoon soda
- 1 teaspoon baking powder
- 1½ cups lemon soured milk
- 2 tablespoons melted butter or bacon fat
- 2 well beaten eggs.

Sift dry ingredients. Add liquid. Beat mixture until it is blended only. Fill hot greased muffin tins three-fourths full. Bake in hot oven (425° F.) for about 25 minutes.

## Lemons Enhance the Savoriness of Vegetables

A bag full of California lemons is the "Open Sesame" to an adventure in savory new flavors in vegetables. Fresh-from-the-garden vegetables are

the most neglected member of the food family. They are usually the least palatable because of overcooking, and consequently are the most rejected. Shorten the cooking time. Undercook rather than overcook vegetables. Learn to enjoy vegetables cooked in the Chinese manner so that crispness is still retained. This simple principle of cookery will retain most of the vitamins and minerals in the vegetables and a large portion of their delicate flavor. Whether the vegetables be fresh, canned or frozen, the addition of the tingling freshness of fresh lemon juice enhances their flavor and makes them really wanted rather than merely accepted.

## Need for Fats is Critical

An urgent appeal to rural women to continue fat salvage comes from B. H. Crocheron, Director of the Agricultural Extension Service.

"The need for salvaged fats continues—in fact, becomes increasingly critical," Crocheron said. "The United States Department of Agriculture recently stated that more than half the annual 500,000,000 pounds of kitchen fats which could be saved go down

the drain. A recent survey shows that 99 per cent of the women of this country know that fat is urgently needed, but that only 60 per cent are current salvagers."

## Potato Lemon Dressing

California lemon juice with its pleasant tart tang is blended with a base of potato to make this creamy dressing which may be used on fish or meat salads or as a tartar sauce. No oil is needed.

- 1 cup sieved potato
- 1 egg yolk
- 2 tablespoons scraped onion
- ½ teaspoon pepper
- ¼ teaspoon dry mustard
- ½ teaspoon salt
- ½ cup evaporated milk
- 4 tablespoons lemon juice
- 1 tablespoon chopped parsley.

Press boiled potato and hard boiled egg yolk through coarse sieve or ricer. Add other ingredients and beat with rotary egg beater until smooth and creamy. Variation in consistency may be made by adding more or less evaporated milk. Chopped olive, pickle or pimiento may also be added. A delicious new dressing.

## Tempting Lunch Box Snacks

The unexpected little snack that is packed into a school lunch box adds a great deal of enjoyment to lunches eaten away from home. Stuff celery with cheese blended with chopped nuts and lemon juice. Place pieces of celery together and wrap in waxed paper. For appetizing crunchers and added vitamins include raw cauliflower, sticks of carrots or turnips.

Whether the lunch is carried in a bag or box, a jar of mixed fresh fruit salad is a naturally sweet dessert to end a lunch box meal.

## Candied Sweet Potatoes

- 6 medium size sweet potatoes, peeled
- ¼ cup orange juice
- 3 tablespoons butter or margarine
- 2 tablespoons flour
- 1 cup dark corn syrup.

Parboil sweet potatoes in salted water. Drain. Place in a greased utility dish. Combine flour with orange juice; add syrup; mix well. Pour over sweet potatoes; dot with butter or margarine. Bake uncovered at 350° F. for 1 hour. Serves 8.

## Lemons Improve Many Spreads for Bread

The juice of California lemons puts character into many an ordinary sandwich filling. Mix lemon juice with tuna, salmon, mashed sardine, avocado, cream cheese, liverwurst and bean. Use a variety of breads during the week such as wheat and rye. Lettuce packed separately in waxed paper will remain crisp.

A popular misconception about frozen foods is that freezing performs a miracle, it improves upon nature. Freezing is the best method of food preservation but it will not transform not-so-good food into the essence of perfection, although under the proper conditions of packaging and storage it will retain most of the good color, flavor and texture that is there to start with. So the selection of food in the most perfect state for eating is of prime importance.

First aid to the traditional Monday "washday blues" is a new plastic clothesline, which does not sag, can be pulled around hooks without cracking or breaking, is easily cleaned with a damp cloth and is resistant to rain, soap, oils, mildew, acids and alkalis.

If it is necessary to bang the refrigerator door, try a little vaseline on the latch bolt.



## TAKE A BOW. . . .

A salute to the Citrus Growers of California who have built a priceless reputation for quality fruit that "takes a bow" in any market.

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## Lemon Crumb Pudding

Never waste bread. Make three loaves do the work of five.

- 2 cups milk
  - 2 cups soft bread crumbs
  - 1 egg, well beaten
  - Grated peel of 1 lemon
  - ¼ teaspoon salt
  - 3 tablespoons lemon juice
  - 1 tablespoon melted butter or margarine
  - ¼ cup sugar.
- Combine ingredients. Mix well. Pour into oiled baking dish. Bake in slow oven (300° F.) 40 minutes.

## Lemon String Beans

Slice thin two pounds of green beans. Boil in salted water about 10 minutes or until tender. Drain and place in saucepan with one ounce of butter or margarine and one tablespoon finely chopped onion. Fry lightly. Add 1 tablespoon minced parsley, salt and pepper to taste, one

cup of hot milk, 1 teaspoon of grated lemon peel and 3 tablespoons of lemon juice. Serve immediately. For a piquant variation, add ¼ teaspoon of angostura bitters or ½ teaspoon marjoram, dried or fresh.

## Keep White Vegetables White

To cooking water, add 2 tablespoons of lemon juice to 1 quart of water to keep cauliflower, corn, rice and potatoes white.

## Wide Frozen Food Range

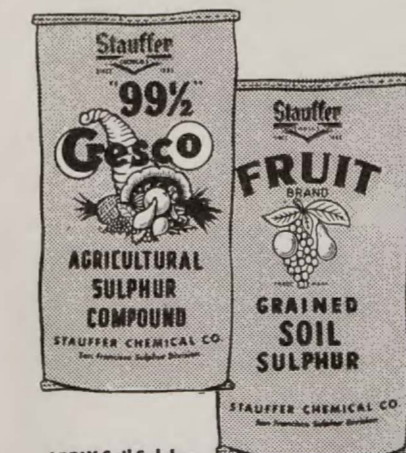
Home freezing can be applied to a wide variety of foods, including all types of meats, fruits and vegetables (except the salad vegetables, those usually eaten raw), fruit and vegetable juices, butter, cream containing at least 40% butterfat, cheese, chicken a la king, spaghetti and meat balls, beef stew, bread, rolls, pies, cakes, cookies and doughnuts.



## Your Land is Like a Bank

If you draw out the Sulphur you must deposit Sulphur

With all crops of citrus and deciduous fruits, grapes, alfalfa, field crops, etc. you are removing sulphur. If you expect your soil to continue to produce large, profitable crops, you must put back the sulphur you are drawing out. Your land is just like a bank—you can't continue to draw out unless you put something in. Depending on the soil and the climatic conditions, we recommend either—



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## Soap Ends Cloudy Glasses

If your eye-glasses cloud with moisture when you go from an air conditioned interior out into the hot sun, treat them with a piece of soap. Just rub a spot on each side of the lens and polish well. Your glasses will stay clear for the rest of the day. Another trick is to wash your glasses with soap and hot water every morning. Rinse them well, and dry on a tissue paper or with a soft clean cloth. If you favor decorative colored rims, this daily bath will keep them bright, too.

## HOUSEHOLD HINTS

Separate cauliflower into flowerets, dip in batter; fry. Serve with tomato or cream sauce.

Fold finely diced carrots, cooked and seasoned, into steaming mashed potatoes.

Glaze carrots with honey. Glaze made with 4 tablespoons butter to ¼ cup honey. Cook tender before glazing.

Dress up beets with white sauce made with sour cream.

Serve canned sweet potatoes baked with orange sections in casserole.

Scalloped corn mixed with cheese cracker crumbs gives corn new tang.

Cooked garden peas, thoroughly chilled and tossed with shredded lettuce, is a summer treat.

Hot green beans are extra-good if you add 1 chopped green onion, ½ cup ketchup, 2 tbsps. bacon drippings to the kettle. Heat again.

To remove fuzz and lint from housescreens, rub with rubber sponge.

To prevent paint from thickening in can after opening, tighten cover and turn can upside down.

Remove paint from clothing by saturating spot with equal parts ammonia and turpentine. Saturate two or three times; wash out in soapsuds.

To keep brush bristles stiff, place in equal amounts milk and water; soak. Dry in sun.

To remove stubborn cork, dip woolen cloth into boiling hot water, wrap tightly around bottle neck. Cork will loosen.

When candles become soiled, clean them with cloth saturated in alcohol.

To remove gum from hands or clothing, rub with white of egg; let stand for few minutes.

When you paint shelves and drawers, give them a rub-down with self-polishing liquid wax. They won't need any more attention than an occasional dusting with a damp cloth.



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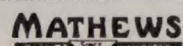
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A young lady recently visited a locomotive works and then later told some of her friends how a locomotive is made.

"You pour a lot of sand into a lot of boxes," she explained, "and you throw old stove lids and things into a furnace, and then you empty the molten stream into a hole in the sand, and everybody yells and swears. Then you pour it out and let it cool and pound it, and then you put it in a thing that bores holes in it. Then you screw it together and paint it, and put steam in it, and they take it to a drafting-room and make a blueprint of it. But one thing I forgot—they have to make a boiler. One man gets inside and one man remains outside, and they pound frightfully; and they tie it to the other thing, and you ought to see it go!"

Sunday School Teacher: "What parable do you like best, Johnnie?" Johnnie: "The one about the mul-ti-tude that loafs and fishes."

A social worker was talking to a girl in a slum district. "Where's your father?" "He's in the penitentiary."

"And your mother?" "Oh, she's gone to the insane asylum."

"What about your sister?" "They took her to the reformatory."

"Well, your brother, now, how about him?" "Oh, he's at Harvard."

"At Harvard? That's fine—what's he studying?" "He ain't studying anything—they're studying him."

Three small boys were bragging about the prowess of their dads. The first boy said: "My dad writes a few short lines, calls it a poem, sends it away and gets \$10 for it." "My dad," spoke the second lad, "makes some dots on a piece of paper, calls it a song, sends it away and gets \$25 for it."

"That's nothing," spoke up the third, "my father writes out a sermon on a sheet of paper, gets up in the pulpit and reads it, and it takes four men to bring in the money."

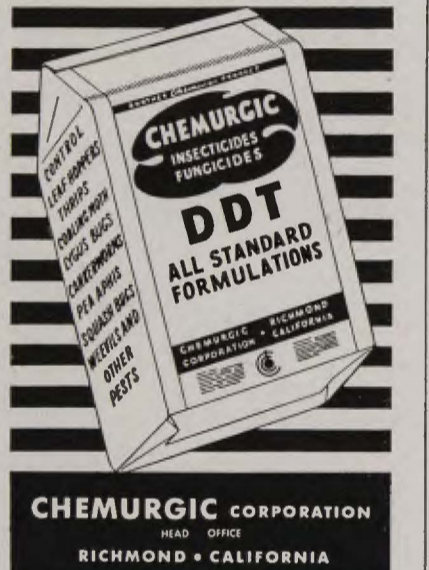
"You remember when you cured my rheumatism a year ago, don't you doctor?" asked the patient, "and you told me not to get myself wet?" "Yes," replied the doctor. "Well, I just wanted to know if you think it's safe for me to take a bath now?"

Speak well of your enemies. Remember you made them.

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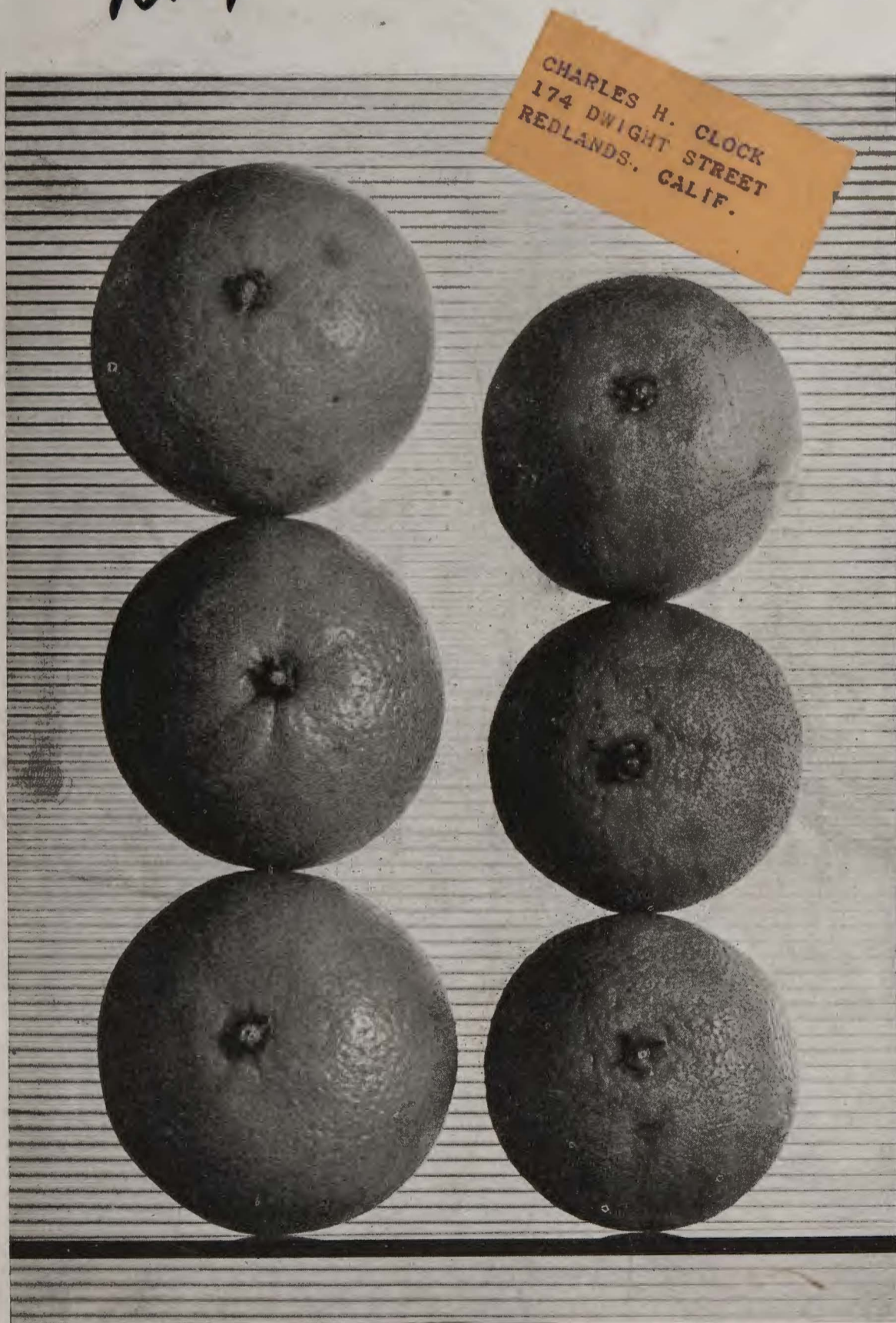
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