

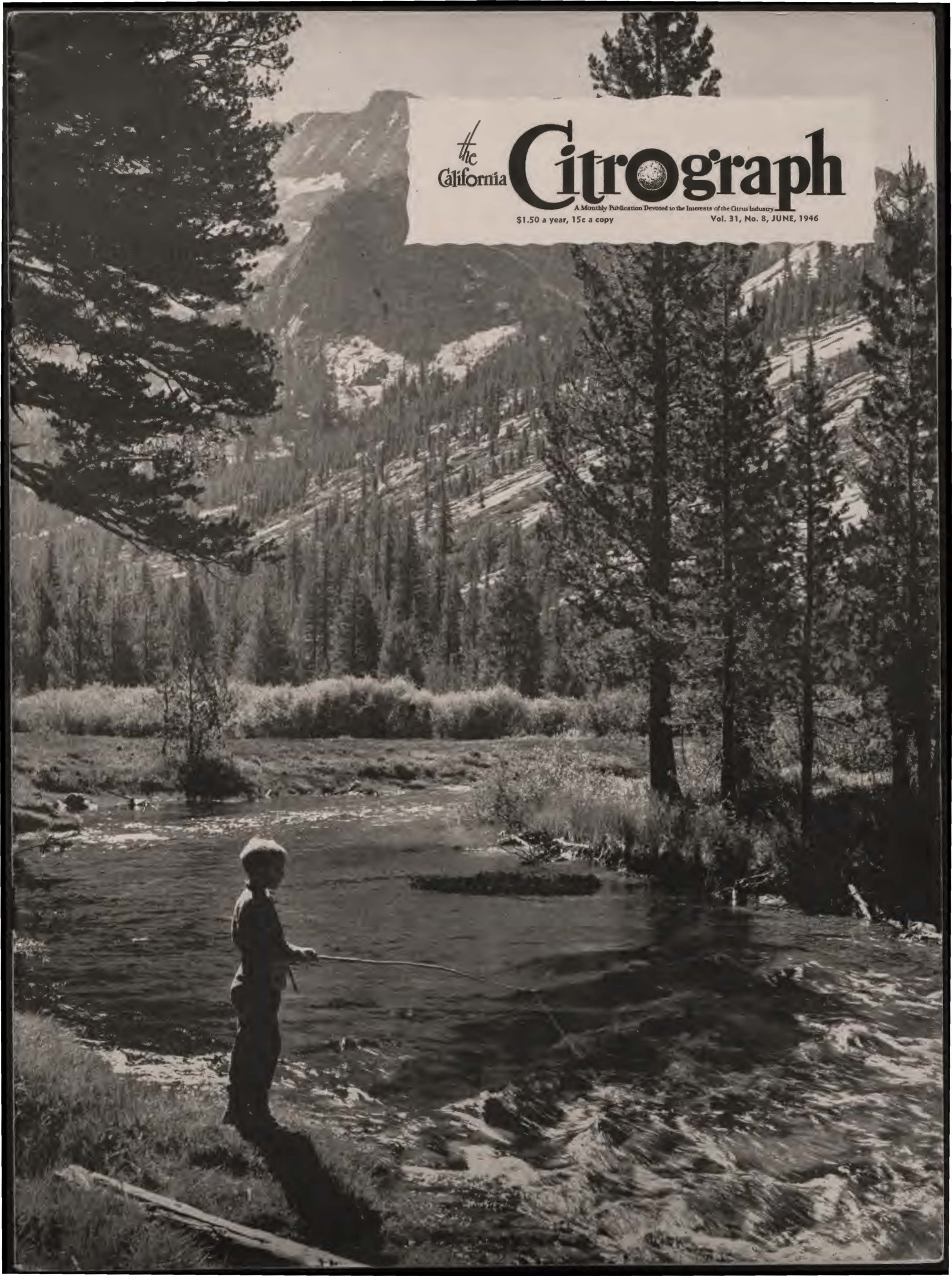
the
California

Citrograph

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California Citrograph

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Repair Work and New Construction

AND what may we say about the photo published on our cover page?—Palisades Creek in the country of the Middle Fork of Kings River, Kings Canyon National Park, photograph by Josef Muench, Santa Barbara. An eloquent picture, perhaps we should allow it to tell its own story. On the other hand it does not seem right to allow it to pass without some comment, editorial writers being what they are.

The picture seems to stand for the best things in life . . . fresh free air, the song of the wind in the pines, the music of the mountain stream, the beauty of ageless crags and the flowers that live for but a week or two. Truth, integrity, vision, freedom, hope, vigor, enterprise.

The mountain scene in the high Sierra depicts our own idea of life at its best, an ultimate to which we aspire, a way of life now unfortunately on shaky foundations which will continue to crumble until our people realize that each of them again must become an active citizen rather than a resident barnacle . . . until our people realize that being a citizen in a successful democracy is a job to be worked at. Repair work and new construction. It is an open secret, which seems to alarm nobody, that certain minorities are out to wreck this country. They have made some progress with their tearing-down tactics.

The average citizen knows so little, and does so little, about the matter of maintaining a democracy that it is appalling. Success in good government requires hard work. Repair work and new construction. Meanwhile active, self-seeking minorities thrive on the indolence of the great majority.

Escape Cause

WHEN he gets all worked up about our status quo (freely translated from the Latin, meaning helluva fix) a friend of ours escapes for awhile now and then. When this man, an orange grower incidentally, finds himself brooding over the disappearance of patriotism, the confusion, indecision, lack of political morals and similar ills that beset us, he creates for a time a new, and often exciting environment for himself.

Know what he does? He meets with a bunch of young fellows in the neighborhood, healthy, husky, noisy, boisterous, clean, eager American kids. They make up a Boy Scout troop. They keep

our friend mighty busy, and fully interested with their goings-on. He tries to teach them Scouting, which is another word for high grade, responsible citizenship. Now and then he loads the kids in his truck. They go to the mountains, or the seashore for a day's outing. They like him. And he is very fond of his kids.

At times between their regular sessions he will meet one or more of the boys on the street. A friendly grin and a "Hi". Maybe a question, or friendly banter. "Sometimes," says our friend, "a boy will come for help or advice. That gives me a big lift. Then I think maybe I'm doing some good. Those are a fine bunch of kids, and I think they are going to be first class citizens . . . by golly, if they should be getting any funny notions, I'll be roughing up some back-sides."

Know a Better Definition?

HERE'S the definition of "cooperatives", neatly packaged in just sixty-one words, by George E. Anderson, executive secretary of the South Dakota Association of Cooperatives, for passing out to business men in this state:

"Cooperatives are democracy in action: (a) owned and controlled by members; (b) members have equality in voting; (c) have open voluntary membership.

"Cooperatives: increase purchasing power of patrons; build and improve communities; are a yardstick for other businesses; break monopolies and cartels; protect the private profit system; pay taxes—property and other taxes; also income taxes on undistributed earnings; are private and free enterprise."

Confused Logic

A MAN of our acquaintance once was engrossed in the task of selling a cow which had a fine set of horns and a good hide but no other physical endowments worth much mention. To a reluctant prospect he put on the pressure with this argument: "She's a fine cow—I raised her from a calf, myself."

Strikes us that in the citrus business there is a parallel with this bit of confused logic. In the purchase of trees for new plantings or replacement purposes it would seem highly important to secure young trees known to be free of virus diseases, as well as being good growthy specimens. Even if the demand is great, better no trees than inferior trees. Trees are a life-time investment. There's no satisfaction or profit in a life-time disappointment.

Mom, Do Oranges Grow In Boxes?

THERE is one thing that I should like to see better understood by the city dwellers and that is the relationship of agriculture to their well-being. The average consumer, perhaps, regards meat, potatoes, milk, bread, and other food commodities as products of the grocery store or meat market, as the case may be.

Our economic structure would be more sound if the city dweller appreciated that every pound of food eaten has been extracted from the soil by farmers and that the farmer's ability to produce and maintain himself and his family thereby is a basic and vital factor in our economy.

We should all realize that low farm income

decreases agricultural buying power. This, in turn, diminishes the market for products manufactured by the city dweller.

A fair price to the farmer means jobs in town producing such things as automobiles, radios, home appliances, clothing and a thousand other things people buy when their income is a little over their expenses. It might be well to point out that a very large percentage of the work in town is made possible by farming. Preparing, processing, packaging, transporting and retail handling all are possible only after production on the farm.—Excerpt from news release by Dr. C. U. Duckworth, Assistant Director, California Department of Agriculture.

How's Your Civic I. Q?

NO one who considers himself an intelligent citizen can be indifferent these days to the deliberations of legislative bodies—made up of men placed in office by you and me—whether it be our men at the UN, the National Capitol, the county government, or the local city hall.

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PROGRESS IN TREE HORTICULTURE

By WILLIAM H. CHANDLER

The interesting discussion which follows is a part of a talk given at the recent Citrus Institute in Tulare County. Dr. Chandler is Horticulturist in the Experiment Station, University of California, Los Angeles.

IT is not necessary for me to tell you what plant pathology and entomology and soil science have done for the citrus industry and for all fruit industries, or what their work means for the security of these industries in the future, you know better than I do from actual experience. I am certain you will agree with me that without the work they have done, if the industry existed at all, it would be a makeshift sort that would not attract any of the aggressive, capable men that are in it now, and I am sure you see the need for as much help from them in the future as you have been having.

My own field, tree-horticulture, however, may need some explaining. By tree horticulture I mean only the study of fruit trees and fruits, not skill in their culture. Experience, I think, has shown that the tree horticulturist must try to know his trees and fruit in every detail; he can't say this kind of study is not practical. He can't know what kind of study will be most helpful in practice until his study has been completed. He can be certain that testing grower's practices will rarely give useful new information; for so many growers, as intelligent as he, have been testing them for so long. If he is to be helpful he must use a method of study and obtain his suggestions from systems of knowledge the growers do not have. He will often obtain his best suggestions from such workers as chemists and plant physiologists who can choose from among all plant species those that are most suitable for growing under controlled conditions, will give much of his time to learning how the principles these men discover can be applied in the orchard. As the system of knowledge in general plant science becomes more complete, with fewer baffling gaps, the horticulturist is becoming more effective in studying orchard problems.

Study of the fertilizer requirements of trees may be used as an example of the improving work of the tree horticulturist. Most of the elements the plant must obtain from the soil have long been known; and rather soon after 1840 mineral compounds began to be sold as fertilizers. At first chemists expected to be able to study the ashes of the plant and analyze the soil for these ash elements and advise farmers concerning fertilizer needs, but they soon found

that the amount of an element usually found in a whole plant may not give very good evidence concerning the amount that must be in the soil for the plant's best growth, and that the amount found in the soil may not be very good evidence concerning the ability of that soil to supply the elements to plants. For some plants such as field and truck crops fertilizer trials seem to be moderately effective in disclosing nutrient deficiencies in the soil.

Special Requirements

Such work with a fruit tree, however, is cumbersome and highly inexact. Owing to its size the tree would have been a poor plant for pot culture or water-culture experiments to learn which elements are essential and which of those taken in are of no use to it. And attempts to learn its special requirements, and deficiencies for it in a given soil, by means of orchard experiments have not been satisfactory. Variability in yield of trees growing in the rather shallow or poorly aerated soils that are most apt to be deficient in some other element than nitrogen is unbelievably great, great enough to hide rather large increases in yield caused by a fertilizer treatment. For example, at a rather noted experiment station in England, in an extensive fertilizer experiment, an elaborate amount of figuring indicated that fruit trees were not responding to applications of potassium. Yet Dr. Wallace, who was one of the pioneers in better methods in studying fertilizer needs, found trees in these plots actually dying for lack of potassium. In another trial the best, instead of the poorest, trees might have been in the plots that received potassium and a greater response might have been indicated even when there was actually no potassium deficiency in that soil. On the other hand, if for an experiment a soil is chosen on which tree growth is exceptionally uniform, it is almost certain to be exceptionally deep and because of its great root system may obtain enough potassium from a soil that is rather low in available supply of that element, so that most of the orchards on the soil type, being on a shallower soil and having less extensive, absorbing root systems, do not obtain enough.

Deficiencies

In studying the requirements of small plants workers noted different symptoms associated with deficiencies. Dr. Wallace in England, I think one of the best horticulturists in the world, and workers in this country, including some at both Riverside and Davis, have made careful studies of

symptoms that are shown by fruit trees for deficiency of each element such as potassium and also the amount of the element present in the leaves at carefully chosen times in summer. Although analysis of the whole plant are not apt to give much information concerning deficiencies, analysis of leaves taken from selected positions when fully developed but not aging is being found very helpful in locating deficiencies, and also in locating soils from which, for a combination of reasons, the tree is absorbing an injurious excess of some element.

If, for example, a given percentage of potassium in leaves chosen at the correct time is found always to be enough for best growth and yield and analysis of leaves from trees well distributed over a district all show that much, then that district need not be studied for potassium again until after a number of years of soil depletion. After all districts with a given soil type have been studied in this way, field trials can be confined to districts where leaf analysis suggest that the potassium supply may not be adequate. In such field trials, which should be distributed over the district, careful observations for disappearance of symptoms that may show at some time of the year may be better evidence than yield records and much less expensive to obtain.

The technique of the scientist had to be greatly refined before some elements such as zinc were found to be essential for plants; chemically pure chemicals and distilled water had to be further purified, containers found that did not have zinc in their structure, and, in some, the dust excluded from the air to avoid supplying zinc to the plant leaves.

After such careful methods had shown that zinc, copper, manganese, and boron, are essential for plants but in quantities so small that 10 to 15 acres of a crop may not use more than a pound a year, horticulturists began to make surprising discoveries. For example, mottle-leaf of citrus and pecans, little-leaf of grapes, rosette of apple, and other deciduous fruit trees, had been studied for 30 years or longer, and then after zinc was found to be an essential element four different groups of workers learned independently, in Florida, Louisiana, Arizona, and California, that this disease could be cured by supplying zinc to the trees.

The surprisingly great ability of most soils to render zinc compounds unavailable gave the horticulturist many problems. Not all workers who studied these problems called themselves horticulturists but I call anyone a horticulturist temporarily, at least, who is helping to build an

orderly system of knowledge about trees.

Citrus trees, and apparently other evergreen trees proved to be rather economically cured by spraying with a zinc-lime mixture; but deciduous trees of most kinds cannot absorb through their leaves enough zinc from a safe, zinc-lime mixture, and trees of some kinds such as the walnut and the cherry cannot absorb through their dormant buds even from a strong zinc sulphate spray, without lime or other neutralizing substance. While such trees can usually be cured by very heavy soil applications or laborous treatment with galvanized iron pieces, no economical method of applying zinc to trees of these kinds has been found.

Photosynthesis

Only about 5 per cent of the substance besides water in the tree is composed of these mineral nutrients. More than 90 per cent of it is from substances formed in the leaves by combination of carbon dioxide from the air with water. The reaction is brought about in some way by light on the green pigments, chlorophyll, the process being known as photosynthesis. The chlorophyll is located in special organs (chloroplasts) in the living protoplasm. The first product of photosynthesis to be found in the chloroplasts is sugar. Carbon dioxide and water are substances of low chemical energy; sugar one of high energy, capable of yielding energy when burned, or when oxidized in the plant. This energy in sugar and some other substances derived from it supports growth and all other processes in the plant. In other words, sunlight supplies to the leaf energy to combine two inactive substances, water and carbon dioxide, into a high-energy substance, sugar, that moving to all parts of the plant becomes the building material and supplies the energy for all necessary processes including the combinations of sugar into the wood substance, cellulose and lignin, that form the body of the tree, and the combination of sugar and the acids derived from sugar with nitrogen compounds to form proteins the principal compound in the living substance, protoplasm.

The reaction by which sugar is formed from carbon dioxide and water has not been produced in any laboratory and the scientist does not know just how it is brought about in the plant, but he has done a lot of interesting work and has learned by indirect approaches a lot of the influence that govern it. The physiologist measures photosynthesis by the amount of carbon dioxide absorbed by the leaf or the amount of oxygen given off. He may call this apparent photosynthesis, because while sugar is being formed by photosynthesis it is also being broken down in respiration to supply energy the cells use for their processes; if he is measuring carbon dioxide taken in by the leaf he cannot measure what is al-

(Continued on Page 327)

George's Bootstraps

By D. M. RUTHERFORD

AS citizens of the American Democracy we pride ourselves in the traditional right of any man to progress as far as his abilities will take him—equal opportunity for all.

Very often it is a man from a foreign shore who uses this freedom to demonstrate what can be done with a generous combination of inspiration and perspiration.

As our case in point we take Mr. George Russell, Ontario, California, orange grower, who stems from Ely Stretham, Cambridgeshire, England, where haiches are dropped all around. George, and his father before him, were bakers and small shop keepers. He came to this country as a young man, found employment on an Iowa farm and later married the farmer's daughter.

Meanwhile World War I came



LINDSAY CELEBRATES

SPRING in the air, orange trees in bloom, the heady fragrance of the perfume of myriad blossoms—called for a celebration.

So Lindsay folks brought out again their Annual Orange Blossom Festival, under wraps since 1941, and celebrated on April 27th. Queen of the event was Miss Ina Mae Redmond, daughter of a pioneer family of Lindsay, junior college student and talented vocalist, very regal for the nonce, whose pleasant smile may be found among the orange blossoms in the accompanying photo.

Lindsay folks grow expansive when the surrounding 40,000 acres of Tulare County citrus fruit orchards are mentioned, and some 20,000 prideful citizens gathered to attend various events. The days doings included a Parade, Homecoming Potluck Picnic (Bet local C.I.'s liked this), Baseball Game between farm teams of the Chicago Cubs and the Cincinnati Reds, an Orange Packing Contest, a Horse Show (some mighty fine horse flesh in these parts) and the Queen's Ball. And everybody was happy, including the dog-weary officials of the local Chamber of Commerce, sponsors of the event.

along and George found himself a "limie" soldier in the U. S. Army. With this fracas out of the way, he again sought the pastoral life and came on to California, but not primarily for the climate. The fact that the girl, along with her family, had settled in the Pomona section, was the motivating influence. . . . And so they were married.

Between them they had a small nest egg of cash, and they acquired a modest acreage, half navel oranges and half peaches, well covered with a mortgage. George knew as much about orange production as an English baker is supposed to know. That was back in 1921.

The next year brought good prices, the peaches bringing \$100 a ton. The following year they brought \$20 a ton. Mr. and Mrs. Russell harvested every peach from six acres to keep their expenses at an irreducible minimum. Russell picked a good many thousands of boxes of his own oranges in those days, saving a little here and there. Later the peaches were replaced by oranges. George added a flock of chickens to help with income, hired out occasionally, and all along traded work with neighbors, hauling, spreading fertilizer and other jobs. If he was to succeed he would have to pull himself up by his own bootstraps.

Lately we dropped in at the modest and very neat Russell home. George was out in the orchard. That is where he is most of the time. We found him up in a tree, doing a little light pruning. Likes to have trees neat and trim, he says. Cuts out interfering limbs before they begin to interfere, and generally keeps a watchful eye over his trees. Does pruning when there's nothing else urgent. Little bit all the time, not much at any time.

We walked around through the orchard. Dark green foliage and lots of it. Clean trees, very good control of pests. Haven't seen any more vigorous, healthy trees anywhere else. Abhis got away somewhat last season but that's understandable with the drastic shortage of nicotine. Careful control of moisture; trees were irrigated a few days prior to our visit, taking no chances if a rain failed to materialize. The trees obviously are well fed, and in orthodox fashion. Maybe it is the heritage of the old country, where men of the land are generous in putting plant food into the soil.

George has a way with a dollar. Since he began farming he has always kept a weather eye out for a bargain. If some manure could be had for the hauling, or something gotten in a trade, George was wide awake to the opportunity. For some years he hauled pulp sludge from the Orange Products Plant sumps for orchard use. Cover crops grew better between the tree rows where

this was applied. When others were going broke he and his family were eating regularly, and laying a little aside to brighten up a rainy day. For many years his orchard, in net returns per acre, had been at, or crowding, the top of the San Bernardino County Orange Cost Study conducted by the Agricultural Extension Service, so reports Ralph LaRue, Assistant County Agent. George uses all the animal manure he can get and supplements it with various kinds of commercial nitrogen, whatever seems to be a good buy at the time. The amount of fertilizer applied is considerably greater than the average application. And as we said before, he keeps as far as possible ahead of citrus pests.

We mentioned the matter of eating regularly, despite shortages of this and that. A few years ago Russell bought a good heifer for \$65. She yields milk worth about \$100 a year, half is consumed at home, the balance sold to neighbors. And then there's a calf each year for veal or swapping. In a pen back of the barn is a well fattened shoat, makings for pork chops and roasts to be stored in the freezer locker. Already the locker is well filled with quality beef, from a steer fattened on the place. A beef steer calf is grown each season. George looks around and picks up a sack of potatoes now and then—at much less than retail prices, of course. Frugal, careful, businesslike. It all adds up to good management, and that brings security and good living, including homemade butter. But one should like to work.

Lately Russell sold a piece of property he developed, part grapefruit, part oranges. Cost records show that the grapefruit paid very well. He planked down the money into an annuity. Security later on. The Russells are keeping the home place where they started housekeeping and began learning about how to grow citrus fruits.

There's probably no more vocal and sincere proponent of the principles of cooperative marketing than George Russell. Don't try to out-argue him on the subject. He joined the Narod house, West Ontario Citrus Association, when he first became a citrus grower, and has been through thick and thin with the cooperative. They have had their problems, but have found that a combination of hard headed management and hard work have put them safely on the right side of the ledger.

Recognizing Russell's worth and energetic interest in the affairs of his packing house association his grower associates elected him to the board of directors some years ago. He has been untiring in his efforts to "make his packing house the packing house of this valley."

George says, "Some folks squawk about paying a good manager a good salary—this is not the place to drive a hard bargain. Pay management a good wage, and insist that it be well earned," says he. "Growers must participate in the management of their

marketing associations by taking an active interest and keeping informed on what's going on—after all these associations were formed for the purpose of helping growers lift themselves by their own bootstraps." So opines George Russell, who understands all about bootstrap lifting, and also knows a good thing when he sees it.

Plain Facts of the Food Crisis

WANT and hunger stalk the earth. The people who are in the greatest need are far from the surplus supplies. But, even if the food in distant regions could be promptly sent to those who need it, there would still be famine. The plain fact is there is not enough food to feed the world."

In this manner B. H. Crocheron, director of Agricultural Extension Service, prefaces his analysis of the world food crisis in a booklet just published by the California State Farm Production Council.

"War has laid its bloody hand on almost all the earth. Many farmers and their families are dead from battle and from the chaos that follows in the wake of battles. Barns are burned. Farm livestock has been killed. Farm machinery has turned to junk. Roads and highways have been churned to rubble. Railroads are ruined. Rolling stock is gone."

In this brief bulletin the essential facts are set forth in simple language and in graphic form, with the material condensed so that busy people may see the world as it is. To this extent it is an experiment in public education. Tables of statistics have been omitted and technical language has been avoided.

Crocheron says even America may not escape this gloomy picture. "We have no large reserves such as were stored in prewar years. During the war we were blest by seasons of high production. Several years of bad weather might bring to fertile America a food shortage which would tax the resources of our soil. Even our rich land might feel the hand of want if our crops should fail in the next few years."

The extension director says farmers should grow all they can of those foodstuffs which can be stored and transported. We need not fear a surplus in staple food crops for some years to come. The world's wounds are deep.

The food needs of the world, the food supply, and the famine problem by areas are presented in simple and direct language of the man on the street.

The bulletin, What About the World's Food? was published to give farmers a full understanding of the world food problem. A limited number of copies are available through county offices of the Agricultural Extension Service.

Botrytis Mold of Lemons

By VIRGIL H. TYLER

A grower's viewpoint concerning the botrytis mold problem of lemons is expressed by Mr. Virgil H. Tyler, manager of the Ventura Coastal Lemon Company. This discussion was presented at the April meeting of the Lemon Men's Club.

THE idea that botrytis mold may have some effect upon production will not be a year old until this next July. The fungus at that time was thought to be affecting the set of fruit in two stages. First, it seemed to attack small lemons already set, some times up to the size of small acorns causing it first to turn gray and then later turn brown. Most of these hardened and turned almost black, their button and stem also darkened and in most cases did not drop, but stayed on the tree for some time. Second, the mold was noted in the blossom parts, especially about the time that they would ordinarily be expected to disengage themselves and fall.

This was particularly noticeable in clusters of blossoms where the blossom parts did not so readily disengage and fall. The mold seemed to make the petals tough so that they would not freely drop. Following this, the button and the stem of these infected blossoms would turn brown and soften, appearing to wither and then drop. It has since been noted, by Harold Ormsby, entomologist for the Ventura Coastal Lemon Co., that if the stigma of the pistil is in any way damaged, before or after the blossom opens, that mold will also attack it.

Since these above conditions were not noted until the overcast period in the Coastal area was nearly over, results from large scale tests with various fungicides cannot be very accurately determined. However, a check made by J. C. Johnston, Citrus Extension Specialist, U. of Calif., and Calvin Delphey, Ventura County Farm Adviser, where 60 clusters were sprayed with Bordeaux mixtures and 60 clusters were marked as checks. After some two months, they determined upon accurate count that the sprayed clusters had set 17% more fruit than the checks. This result was obtained despite the fact that the mold was in an advanced stage at the time of application of the fungicide.

In the short time that has elapsed since last July, we have formulated the following opinions as they relate to our Coastal acreages:

1. That Botrytis mold control during periods of overcast, such as experienced during the spring and early summer of 1945, can be an important production factor. A correlation of crop to weather covering several years showed that production varied in close relation to the duration of

the overcast. It is also interesting to note that in spite of the fact that Coastal groves have bloom in varying amounts most of the year, and during the spring months a heavy bloom is normally expected, this area is thought of as being a "late crop" region, although in 1941 this was not the case. The theory that Botrytis mold does not allow a set during our normally overcast and foggy late springs and early summers, and that the normal expectancy of sunshine and dry winds during the late summer and fall are not conducive to active mold growth, is intriguing, to say the least.

2. That it seems quite certain that conditions under which the fungus will most readily thrive are: (a) overcast of at least several days duration, (b) high relative humidity, (c) mild temperatures and (d) absence of winds which have both a drying effect and would also blow the flowering parts of the blossom free from the small fruit and its button.

3. That even with a late start at control this past year, results were satisfactory enough to make several growers feel that the result was well worth the expense involved.

4. That it may be 3 or 4 years before it can be determined whether or not this fungus control, or lack of control, is an important production factor.

5. That other than copper fungicides must be found because coppers would be too dangerous to use as a standard practice.

6. That results up to this time indicate that for good control, fungicides must be applied in four week intervals or less. Each new bloom must be treated before maturity.

In line with the above opinions it is felt that the following determinations, as well as others that may arise, must be formulated:

1. That extensive checks must be made to determine the most effective fungicides, their long range effects on citrus trees, the time of application for best results and intervals of application.

2. That it must be determined whether values other than possible production increases are obtained by the additions of correct fungicides.

A. To the trees. Since it is known that Botrytis attacks the twigs and limbs of citrus trees if given the correct set of conditions and a starting point, how much of our dead wood problem can be eliminated? It has been noted this past year that when the conditions most favorable for mold growth are present, that the mold evident in the blossom, small fruit, its button and stem, sometimes continues into the twigs causing them to die back varying distances. It has also been found that some results in controlling the mold on bruised twigs

and limbs damaged by frost this year has been obtained by additions of fungicidal sprays.

B. Can the mold problems in the packing house be lessened by controls in the field? It seems reasonable to assume that spores may collect in the button of the very small lemon while the button is still open. If the conditions at that time are not favorable for mold growth or if the tree is resistant, the small fruit will "grow into the button" or fill the button, and the spores will be captured there. As soon as the fruit is picked and the trees' resistance to the mold is ended, unless these spores are reached by whatever packing house treatment is used, then we may assume that decay may break out under this button. Tests run by Ventura Coastal Lemon Company last fall showed that the seal between the outer edges of the button and the lemon were tight enough not only to exclude liquid fungicides but also gas fungicides. The use of heat would be most effective if the fruit was allowed to stay in heated water only long enough to penetrate through and around the button. As a test last fall we took several boxes of lemons, cut the buttons off from half the fruit, washed the two lots separately and stored them as two lots. Both lots received the Decco gas treatment while in storage. After 60 days the two lots were checked for decay. The lot without buttons had no decay, while decay was found in the lot with the buttons left on. Although this check was not conclu-

sive it did bear out the above theory to some extent. It was also determined that Botrytis was not the most serious decay brought on in this manner. If a good fungicide can be applied while the little button is still open, and this "little cup" can be freed of spores, then it seems probable that some of the packing house decay problems may be helped.

3. To determine if non-cultivation practices do not help in this fungus control. One of the most dreaded carriers is dust, so one of the benefits would be dust control. Also it seems plausible to assume that since non-cultivation presents but one surface and if this surface could be treated, any spores lodging there might be killed.

4. Will deficiency controls and other helpful practices that build a stronger tree make the tree more resistant to the mold, thereby making the fungus a minor problem?

5. To determine the effect of thrip control on set in the Coastal area. Ormsby has noted that the garden thrip and bean thrip prevalent in this area damages the stigma of the bloom allowing the fungus a starting point. The mold quickly spreads over the entire stigma area, and in most all cases where this happens, the small lemon turns yellow and drops. It seems possible that the damaged stigma prevents pollination.

These and other determinations must be made. It becomes very evident then, that much work must be done and very close observations must be made.

Precautions in the Use of 2,4-D Weedkillers in Citrus Orchards

By ETHELBERG JOHNSON

Mr. Johnson is district supervisor of the Bureau of Rodent and Weed Control and Seed Inspection, State Department of Agriculture.

IN an earlier report (Citrograph 30:10:305, August, 1945) some effects of 2,4-D on citrus trees were described, and caution was urged in the use of hormone weedkillers in the vicinity of citrus trees pending further research.

As a new season of weed control approaches, it is apparent that a considerable acreage of morning glory and other susceptible weeds will be treated in citrus orchards. It is timely, therefore, to repeat this word of caution and to outline the conditions for minimizing the risk of injury to citrus.

It has been amply demonstrated that 2,4-D in minute quantities will injure and even kill citrus trees when applied either to foliage or to the roots. On the other hand, no permanent injury to citrus trees has yet been reported incidental to weed control where reasonable precautions have been observed in the application.

precautions are observed in the treatment of weeds in orchards with 2,4-D:

1. Avoid treatment near the rainy season to prevent chance leaching into the root zone.

2. Avoid treatment during periods of active tree growth. New growth is particularly sensitive.

3. Time the treatment so that maximum results on the weeds can be expected. Generally speaking, this will mean treatment in an active state of growth, avoiding days of excessively high temperatures and low humidity.

4. Use the lowest dosage which can be expected to kill the weeds. For actively growing morning-glory, 500 parts per million (0.5%) is sufficient, adding a wetting agent if necessary to insure thorough coverage.

5. Avoid treatment in windy weather to prevent drift.

6. Keep the pressure at a minimum. 50 to 75 pounds pressure is enough.

7. Use a fan-shaped spray in preference to cone or "gun" types. It is more easily controlled.

8. If a boom is used, it should be hooded to prevent spray and fog from coming in contact with tree foliage.

9. If the spray rig is later to be used for tree spraying, prompt and thorough cleansing cannot be stressed too much. For water-soluble salts of 2,4-D, several washings with clean water should be sufficient. For the acid and oil-soluble esters, the rinse water should be alkalinized with lye, sal soda, baking soda, trisodium phosphate, or other alkalinizing agent.

10. The most striking feature of these results is that the oil content of the peel was highest in the inland fruits and progressively lower in those grown nearer the coast. On a tonnage basis, the fruit grown in the inland district yielded 39 per cent more oil than that grown in the coastal district.

The results of a similar study on the fruits from navel groves in inland and intermediate districts are shown in figure 1. The average yield of oil per fruit is plotted against the average area per fruit.

Like the Valencias, (table 1), these fruits were picked at approximately monthly intervals from the time they were very green until they were well past the initial stages of commercial maturity (September to February). The results portrayed in figure 1 show that, in general, a straight line relation existed between the increase in yield of oil per fruit and the average area of the fruit. They show also, as in the case of the Valencias, that the peel of the inland fruits contained much more oil than the peel of those from the intermediate district.

As may be seen, the yield of oil per 100 sq. cm. of fruit surface was

Some workers have reported that the amount of volatile oil in the peel of oranges begins to decrease after the fruits have reached maturity. That this is not true, at least for oranges grown in southern California, is shown by the data presented in table 2 and in figures 1 and 2.

The first test reported in table 3 was made about 4 months and the last test about 8 months after the Valencias in this grove had become commercially mature. The yields of oil from the peel for the first three tests were approximately the same; the last test indicates a slight but probably insignificant increase in yield. In figure 1 the last tests on these navels were made about 2 months after they had become commercially mature but there is no indication that the yields of oil had started to decrease. On the other hand, there is an indication in figure 2 that at least in some cases, there may be an increase in yield of oil in the peel of Valencias after they are mature. These fruits grew very little after they had a surface area of 120 sq. cm. but the yields of oil increased very materially. The variations, shown by the scattering of the points, were probably caused by environmental factors. That there was not a similar upward curve in the graph for the navels (fig. 1) may be due to the fact that navels mature and are picked during the winter when food manufacture is at a minimum.

Size of Fruit

The 50 large and 50 small Valencia oranges used in each of these tests were taken at random from the same boxes on the receiving floor of packing houses in different districts.

The mean yields of oil from the samples of large and small fruits were:

Large Fruits

ml. Per 100 sq. cm. lbs. Per ton

0.93±0.14 14.1±1.9

Small Fruits

0.90±0.12 15.9±2.1

(Continued on Page 329)

1. References to similar work on volatile oil in citrus peel in Florida and in other countries, and details concerning the methods and materials used in the present studies may be found in Plant Physiology (in press).

Fig. 1. Changes in the volatile oil content of the peel of navel oranges with increase in fruit size.

Fig. 2. Volatile oil content of the peel of Valencia oranges in relation to fruit size and environment.

Fig. 3. Yield of oil in pounds per ton, correlated with the yield in ml./100 cm² of surface area of Valencia oranges.

Volatile Oil Content of the Peel of Oranges

By E. T. BARTHOLOMEW and WALTON B. SINCLAIR

Dr. Bartholomew is Plant Physiologist and Dr. Sinclair Associate Plant Pathologist in the Citrus Experiment Station of the University of California, Riverside.

presented here concern different phases of the problem than those worked on by Wilson and Young.¹

Effect of Maturity

Samples of Valencia peel were tested at approximately monthly intervals from the time the oranges were very green (August 30, 1944) until about two months after they had reached commercial maturity (May 29, 1945). Table 1 shows that during this period the mean surface area per fruit increased from 53.8 sq. cm. to 122.7 sq. cm. (1 centimeter=0.3937 inch), and that, regardless of the change in maturity and increase in size of fruits, there was little change in mean yield of oil per unit area (100 sq. cm.) of the peel. On the other hand, the yield of oil per fruit, on the basis of mean surface area, increased from 0.42 ml. to 1.09 ml. (1 milliliter=1 cubic centimeter or about 1/1000 quart). This shows that the total yield of oil in the peel is correlated with the surface area of the fruit.

Wilson and Young, in 1917, appear to have been the only ones who have made quantitative studies on the volatile oils in the peel of citrus in California, except possibly on a commercial basis. Most of the results

TABLE 1
Changes in the volatile oil content of Valencia orange peel during growth of fruit.

Sample	Date Fruit Picked 1944-45	Mean Surface Area per Fruit		Mean Yield of Oil in Peel	
		cm ²	sq. in.	ml. Per 100 cm ²	ml. Per fruit
1	Aug. 30	53.8	8.39	0.79	0.42
2	Oct. 5	74.9	11.66	0.79	0.59
3	Nov. 16	95.2	14.81	0.79	0.75
4	Dec. 14	103.2	16.03	0.78	0.76
5	Jan. 15	115.6	18.01	0.75	0.86
6	Feb. 12	116.6	18.21	0.80	0.93
7	Mar. 19	117.7	18.41	0.78	0.91
8	May 29	122.7	19.21	0.89	1.09

TABLE 2
Volatile oil in peel of overmature Valencia oranges from the inland district of southern California.

Date Fruit Picked 1945	Mean Surface Area per Fruit		Mean Yield of Oil in Peel	
	cm ²	sq. in.	ml. Per 100 cm ²	lbs. Per Ton of Fruit
July 23	126.9	19.7	1.17	38.7
Sept. 4	141.8	22.0	1.20	38.3
Oct. 9	133.1	20.6	1.18	38.5
Nov. 6	131.3	20.4	1.21	38.3

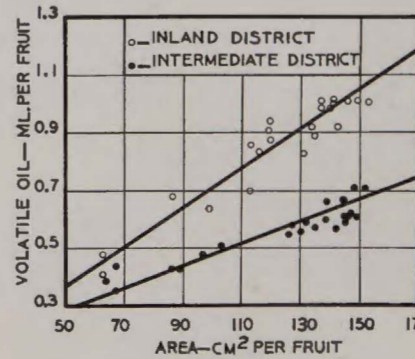


Fig. 1. Changes in the volatile oil content of the peel of navel oranges with increase in fruit size.

Effect of Environment

In the first series of tests, peel samples were taken from Valencia oranges grown in different districts—inland, intermediate, and coastal. All fruits were 4 to 5 months past their initial stages of commercial maturity, and all had approximately the same equatorial diameter. The fruits from 66 groves were used in these tests. The mean yields of oil per 100 sq. cm. and on a tonnage basis were:

Inland District		Intermediate District		Coastal District	
ml. Per 100 sq. cm.	lbs. Per ton	ml. Per 100 sq. cm.	lbs. Per ton	ml. Per 100 sq. cm.	lbs. Per ton
1.14±0.12	18.4±1.68	0.87±0.03	14.6±0.50	0.79±0.06	13.3±0.92

The most striking feature of these results is that the oil content of the peel was highest in the inland fruits and progressively lower in those grown nearer the coast. On a tonnage basis, the fruit grown in the inland district yielded 39 per cent more oil than that grown in the coastal district.

The results of a similar study on the fruits from navel groves in inland and intermediate districts are shown in figure 1. The average yield of oil per fruit is plotted against the average area per fruit.

Like the Valencias, (table 1), these fruits were picked at approximately monthly intervals from the time they were very green until they were well past the initial stages of commercial maturity (September to February). The results portrayed in figure 1 show that, in general, a straight line relation existed between the increase in yield of oil per fruit and the average area of the fruit. They show also, as in the case of the Valencias, that the peel of the inland fruits contained much more oil than the peel of those from the intermediate district.

As may be seen, the yield of oil per 100 sq. cm. of fruit surface was

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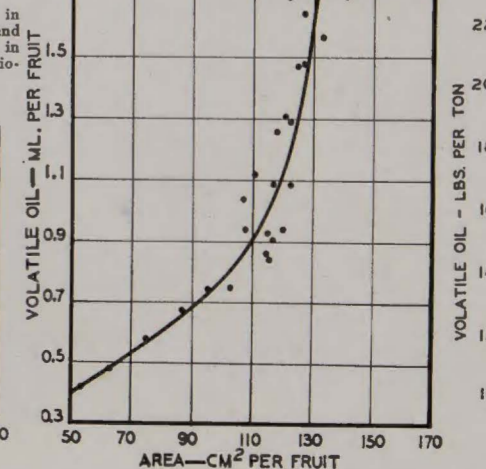


Fig. 2. Volatile oil content of the peel of Valencia oranges in relation to fruit size and environment.

Some workers have reported that the amount of volatile oil in the peel of oranges begins to decrease after the fruits have reached maturity. That this is not true, at least for oranges grown in southern California, is shown by the data presented in table 2 and in figures 1 and 2.

The first test reported in table 3 was made about 4 months and the last test about 8 months after the Valencias in this grove had become commercially mature. The yields of oil from the peel for the first three tests were approximately the same; the last test indicates a slight but probably insignificant increase in yield. In figure 1 the last tests on these navels were made about 2 months after they had become commercially mature but there is no indication that the yields of oil had started to decrease. On the other hand, there is an indication in figure 2 that at least in some cases, there may be an increase in yield of oil in the peel of Valencias after they are mature. These fruits grew very little after they had a surface area of 120 sq. cm. but the yields of oil increased very materially. The variations, shown by the scattering of the points, were probably caused by environmental factors. That there was not a similar upward curve in the graph for the navels (fig. 1) may be due to the fact that navels mature and are picked during the winter when food manufacture is at a minimum.

Size of Fruit

The 50 large and 50 small Valencia oranges used in each of these tests were taken at random from the same boxes on the receiving floor of packing houses in different districts.

The mean yields of oil from the samples of large and small fruits were:

Large Fruits		Small Fruits	
ml. Per 100 sq. cm.	lbs. Per ton	ml. Per 100 sq. cm.	lbs. Per ton
0.93±0.14	14.1±1.9	0.90±0.12	15.9±2.1

As may be seen, the yield of oil per 100 sq. cm. of fruit surface was

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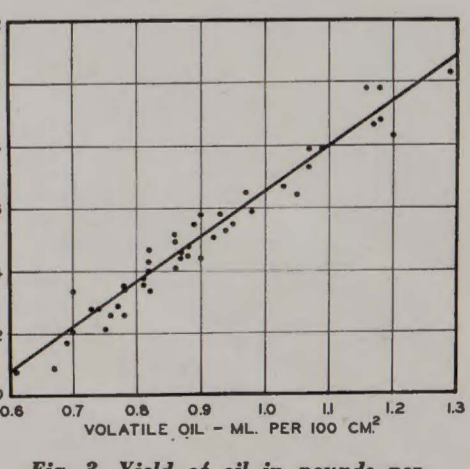


Fig. 3. Yield of oil in pounds per ton, correlated with the yield in ml./100 cm² of surface area of Valencia oranges.

Hearings on Regional Farm Problems

HERE are a few observations made at the hearings on agricultural matters held in San Bernardino recently by Congressmen Harry Shepard and John Phillips. The affair was well conducted and it was apparent that there was an earnest desire to get at the roots of the various farm commodity problems.

The matter of surplus military housing available for use on farms was sifted through pretty thoroughly. Here's the procedure to follow if you hope to get some living quarters for hired help. Apply to the local office of the Farm Production Committee either as an individual or as an association of several individuals. You cannot deal with the army as an individual, you must deal through the local office of the Farm Production Council. They will make it possible to inspect the buildings that have been declared surplus and are for sale. Then a firm offer is made.

E. F. Hayes, whose office is located at Camp Ayres, Chino, is the representative in southern California. The State Farm Production Council is the state agency through which such matters pass—the Council is the qualified agent to deal with the Army Engineers, who have in charge the matter of disposal of equipment which has been declared to be in surplus.

Clyde O. Hooper, vice president of the California Farm Bureau Federation spoke in favor of a reorganization of the United States Department of Agriculture, pleading for better coordination of activities and in certain instances consolidations of departments. In view of the feed shortage he urged that no grains be used for alcohol production. He declared that in the determination of parity prices for farm commodities labor costs must be included. The present method of calculation is ob-

solete, Hooper says. He urged that subsidies, as contributors to inflation, be terminated as soon as possible and that ceiling prices be made to apply at the retail level only.

Boyd Stewart, dairy farmer and state triple-A official, remarked that government subsidies, purely an artificial stimulus, had completely upset the dairy industry. The fact that dairy income is partly dependent upon a subsidy, a governmental appropriation which could be terminated in a short time, causes considerable worry among dairymen. The fact that men in government agencies 3000 miles away from here think they know more about our business than we do is disturbing, to say the least.

H. J. Patterson of Fontana urged that local people be provided with more technical assistance for soil and water conservation and that more authority be allowed on a county basis, because of the specialized problems in our western sections. There should be closer coordination with flood control district activities, and more effort made to sink rainfall

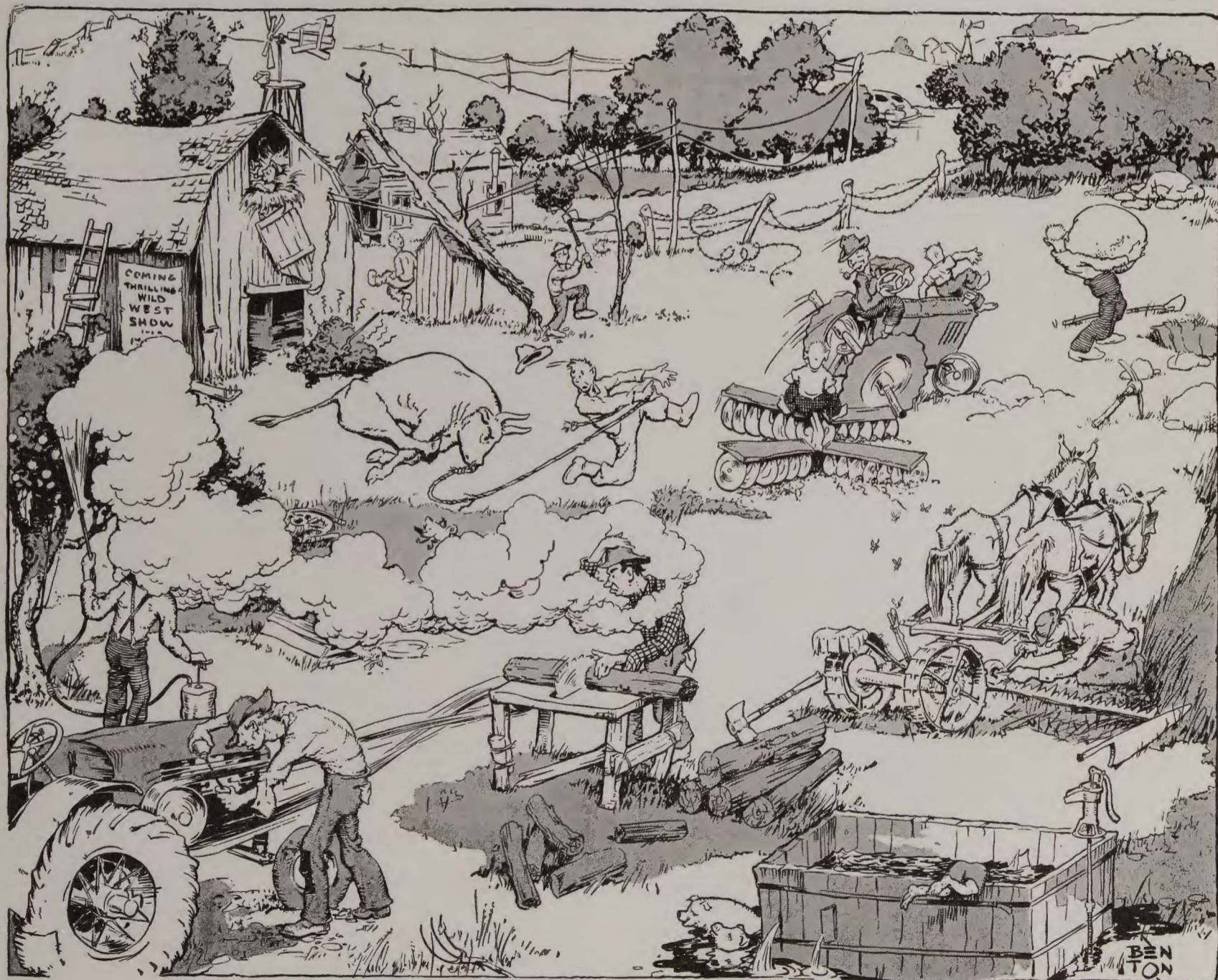
runoff into the soil to build up underground water.

Otto Knudsen of Redlands discussed the water problems in the upper Santa River Basin. At present there is no constructive program for developing a water policy. Various groups must get together and coordinate their interests and activities. Every possible solution must be studied. This matter is of vital concern to every person in the area. With increasing demands for water, a few dry years could prove ruinous.

W. C. Tesche of the California Walnut Growers Association had no praise for the OPA. Although in good health he viewed with jaundiced eye the making of reciprocal trade treaties outside the jurisdiction of Congress, it's horse trading using some one else's horse. Congressman Phillips remarked that he felt the "most favored nation" clause was an abomination. Tesche also urged every effort to secure a supply of nicotine sulfate for pest control.

(Continued on Page 302)

What's Wrong With This Picture? Answers on Page 310



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

COUNCIL SECRETARY CONDEMNS FOOD SUBSIDIES

Says Food Prices Should Reflect Supply and Demand

"At a time when farm production is at a peak level, continued food subsidies merely serve to create demand for food which cannot be satisfied and thus to set the stage for black markets," states John H. Davis, executive secretary, National Council of Farmer Cooperatives, commenting on the drive for food for famine area relief.

Rationing Unsatisfactory

Davis pointed out that "production of such subsidized items as wheat, meats and dairy products cannot be increased in the next year or so to the point of satisfying demand at existing ceiling prices. The country is not in position to bring about orderly distribution through rationing. Therefore, the only feasible means of bringing supply and demand together is to allow the prices of such food items to reflect the balance of supply and demand. Such adjustments will also reduce the wasteful use of cheap food and channel the slaughtering of livestock back into channels where by-products such as hides, hoofs, bones, blood, and fats will be saved."

Hits Black Market

Davis further stated, "To the extent that black markets exist or develop the consumers do not benefit from food subsidies—the principal benefactors become the black market operators. The consumers not only have to pay the black market price, but also make up the subsidies and cost of administration in increased taxes. Black market operators could not exist except for demand being out of balance with supply. If such lack of balance were the result of abnormally small production one might argue that we should struggle through until such time as supplies catch up. But food production is at an all time peak and is not likely to increase. Therefore, the only practical means of bringing about a balance is to bring demand in line with production. This can best be done through price adjustments. Such adjustments will not mean hunger to Americans nor will it mean excessive prices. It will mean better distribution of foods, a reduction in food waste, increased food production, and a throttling of black markets. This will also mean maximum food for foreign relief."



Not a new way to pick oranges; just a pretty picture of California ranch life at its best. No other agricultural area can show oranges and walnut trees in the same scene and no other area can boast of such "natural" beauties.

POOR APRIL WEATHER HURTS LEMON RETURNS BUT TOTAL SALES NEAR ALL-TIME RECORD

Unseasonable weather blanketed practically the entire country throughout April, causing the lemon market to decline but total sales for the first six months of the current year continued heavy. Exchange packed sales from November 1 to May 4 were 6966 standard cars, almost equal to last year's all-time record of 7105 cars sold during the same period.

April Shipments Steady

Industry fresh lemon shipments totaled 2000 cars during April, 300 less than last year but 200 cars ahead of the same month in 1944 and 1943. Exchange sales of packed lemons were 40 cars greater this April than last year with 1495 sold compared with 1455 in 1945.

Supplies in the hands of the trade remained in line with demand during

the month. Retailers generally expressed the belief that the lemon market would swing upward with the advent of warmer weather.

Storage Continues Heavy

Industry storage on May 5 was 9760 standard cars and peak storage was anticipated May 19. Storage last year on the same date was 7960 cars and 6640 cars two years ago. April picks were estimated at 6550 cars compared with 5780 actual cars last year and 4150 in 1944. Estimated May picks were 4350 cars, slightly less than the actual pick of 4660 cars in 1945.

Products Diversion High

Of the 15,800 standard car industry crop movement to May 5, (Continued on Page 297)

NAVEL SEASON ENDS ON HIGH RETURN LEVEL

Central California Valencia Crop Cleans Up. Early

Total f.o.b. returns for fresh navels and miscellaneous varieties sold by the Exchange were the third greatest in the annals of the organization, according to figures compiled at the conclusion of the 1945-46 navel shipping season. The early breakdown indicates total f.o.b. returns are approximately 15 percent less than last year's all-time record, due to the lighter crop this year.

Demand High in April

During the entire month of April, demand exceeded supply and practically all sales were made at ceiling. The seasonal advance in ceiling prices, effective May 1, saw no let-down in demand. Exchange sales of packed oranges totaled 1923 standard cars during April, a big reduction from sales for the same month a year ago when 4307 cars were sold. The f.o.b. average was 10c per box higher this year than last.

Total industry fresh fruit shipments were 18,800 cars during the month, 100 cars less than the same period last year. Of the total, California-Arizona shipped 6500; Florida 11,700; and Texas 600.

Short Central Shipping Season

As of mid-May, only 1150 cars of Central-Northern California valencias remained for shipment compared with 3300 still to be moved the same date in 1945. Eating quality and general appearance of the Central California crop were satisfactory and the fruit met ready trade and consumer acceptance. Sizes in the crop were ideal, averaging 214 fruit per box.

Small Sizes from South Again

Sizes for fresh shipment from the Southern California producing area threaten to be even smaller than last year's all-time record crop of small size southern valencias. There is not the quantity of 392s and smaller in the current harvest but there are more 288s and 344s.

Of the estimated 50,000 car Southern California Valencia crop, it is expected that approximately 89 percent will be moved fresh. Last year, 77 percent of the crop was shipped in fresh form. Products plants may be hard-pressed for supplies this summer under the strong demand for fresh fruit.



Sunkist Car Card Wins Reader Survey

Sunkist street car cards carrying lemon laxative copy showed the highest readership of any cards carried by the street cars and busses operated by the Milwaukee Electric Railway and Transport Company, according to a survey recently completed by the Advertising Research Foundation. The Foundation is sponsored jointly by the American Association of Advertising Agencies and the Association of National Advertisers of which the Exchange is a member. Results of the survey showed that the average cost per 1000 readers was just slightly more than 34c. Costs on various media, newspaper, magazines, etc., are normally figured on costs per thousand and 34c is considered very economical.

Twelve Car Cards Studied

Included in the survey were the street car cards of 12 advertisers. Eight were national in scope and four were local Milwaukee institutions.

compared with 6000 cars in 1945. The potato crop is figured at a whopping 30,000 cars. These two figures do not take into consideration the heavy volume of deciduous fruit that must move as soon as it matures.

Threat to Canneries

The tin situation is more indirect but nonetheless threatening. Several California canneries have stated they have only a three months' supply of cans at best. A complete shutdown of tin manufacture would result in a total stoppage of canning activity when can inventories had been depleted. The food loss to the nation and income loss to California under such circumstances would be staggering.

The results showed that the Sunkist card was seen by 27 percent of the population of Milwaukee or 142,000 riders during the 30-day survey period.

Indication of the wide spread of readership in cards studied is the fact that the lowest rated card in the survey showed only 11 percent of the population or 56,000 riders in the 30-day period.

Top Place Winners

Following the Sunkist card in the survey were one local advertiser and three national. The Boston Store, a Milwaukee institution, and Wrigley's Gum, were second with a rating of 26 percent; Wheaties was third with a rating of 24 percent.

Local institutions generally rank high in readership surveys because they represent organizations of immediate interest to the readers. The Wheatie car card employed the entertaining cartoon technique which has been found to be very effective in gaining readership.

Survey Carefully Conducted

To insure complete fairness and a dependable result, the survey was conducted on a formula previously tested for accuracy. Only 12 advertisers were allowed to participate in the survey and the cards submitted had to be exclusive first showings in Milwaukee. In interviewing car riders, extreme care was taken by the interviewer to avoid influencing the answer. Riders from the entire area served by the transit lines were interviewed.

Street car cards have been used by the Exchange for both oranges and lemons as strong reminder advertising in addition to campaigns in magazines and newspapers.



Lichy's famous cartoons are now selling Sunkist lemons. Appearing regularly in national restaurant magazines, cartoons similar to the one above stress the increased use of lemons in a simple, humorous manner. Lichy is well known for his "Grin and Bear It" cartoon series.

Coal Strike Hurts Citrus Crop Movement

Whether or not the 12 day truce of the coal strike results in settlement of the dispute is of paramount interest to California citrus growers. A coal strike can hurt citrus in two major ways. First, by creating a shortage of refrigerator cars and second, through a shortage of tin for canning citrus by-products.

The Exchange has asked the support of California legislators to halt the coal strike. Messages to California Representatives and Senators have outlined the dire consequences of continued lack of coal.

Car Shortage Perils

The car shortage angle is the most immediately serious since reefers are currently available on a hand-to-mouth basis at best. Prior to the strike truce, industry transportation authorities estimated that an acute car shortage would exist within ten days. Main trouble from a car standpoint lies in the fact that under a coal shortage, eastern lines do not have the motive power to bring reefers to points where western Diesel propelled locomotives can pick them up.

A shortage of cars at this particular time of the year hits all California agriculture a body blow. In addition to the constant movement of citrus, cantaloupes are ready to roll and the Kern County potato crop will soon be loaded. The melon crop is estimated at 11,000 cars this year

GRAPEFRUIT MARKET IN LATE MAY GAIN

Unlimited Volume From Desert Hurts April Fruit Returns

Marked by an upward curve early in April, the grapefruit market late in the month slipped under heavy shipments from Texas and Florida, and uncontrolled volume from the Desert area. With decreasing supplies from the two southern states in early May, the trade focussed attention on Desert fruit and the grapefruit market steadied with slight gains in price.

Texas had less than 1500 cars remaining for fresh shipment May 1 and Florida reports 2838 actual cars still to be shipped fresh on May 4 compared to 431 cars left the same date last year. Hurricane loss reduced the grapefruit crop last year, accounting for the wide variation in balance still to be moved after May 1, 1945 and 1946.

Texas Still Leads in Volume

Texas shipped 4500 cars of the 8600 car total industry fresh shipments in April. Florida shipped 3200 and California-Arizona 900. Last year, California-Arizona shipped 1100 cars; Florida 2000; and Texas 3800 for an industry movement of 6900 standard cars in fresh form.

Exchange packed sales for April were 280 standard cars compared with 250 sold the same month last year. The f.o.b. average was 17c per box lower this year.

High Percentage to Canneries

Of the estimated 80,000 car total Florida grapefruit crop, it is reported that approximately 70 percent will be canned in the southern state. Several of the packing houses have closed due to lack of supplies for canned citrus has no ceiling and many growers have diverted their fruit to the canneries.

Desert grapefruit shippers have canned 35 percent of their total 6700 car movement to-date. An estimated 5000 cars of Desert fruit still are to be harvested compared with 4500 cars on May 1 last year.

Lemon Sales

(Continued from Page 295)

products diversion accounted for 37 percent, somewhat higher than the 21 percent sent to products from the total crop movement of 13,100 cars for the same period last year. Products diversion is heavier this year due to heavy volume of extremely small sizes and advanced maturity.

According to present estimates, distribution to products during May and June will average approximately 33 1/2 percent, dropping sharply for the rest of the season.



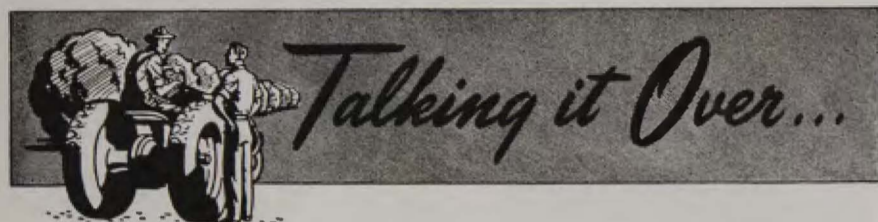
It's plain to see that Exchange Dealer Service men are back to work after an enforced absence during the war. These displays and hundreds more like them are being installed in all markets of the country to promote the sale of Exchange fruit. The present staff of 30 men is making approximately 5000 calls each month on wholesale and retail dealers and will do yeoman service on small size oranges as well as lemons and grapefruit this summer.

The Sunkist Courier DEPARTMENT

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

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| L. W. FOWLER, Santa Barbara | | |
| L. P. FULLER, Woodland Hills | | |



Those of you who follow the "Sunkist Reporter" column, appearing every two weeks in most citrus belt newspapers learned of the regular sale of Exchange fruit at Moose Factory on the shores of Hudson Bay far to the north of Toronto. Here's a report of Exchange sales so far north that you'll begin to think the citizens of Moose Factory address each other as "colonel" and always say "you-all." Get out your atlas; put on your parka; we're going on a trip.

It seems that during the past two seasons, the fur trade operators in the Mackenzie District of the Northwest Territory of Canada have not been waiting for the summer route to open up and have been by-passing the water shipments on Great Slave Lake by using portions of the Alaska Highway. So this Exchange jobber sent a good portion of a car of Exchange oranges from Edmonton to Dawson Creek by railway. If you consult your atlas, you'll see that Dawson Creek is about 500 miles northwest of Edmonton. At Dawson Creek the fruit is loaded onto trucks and hauled 300 miles farther north to Fort Nelson over the Alaska Highway. This is the first time I've heard of California fruit traveling on that famous road.

Then the third method of transportation is brought into play when the fruit is loaded on boats in the Liard River at Fort Nelson and carried to the junction of the Liard and the mighty Mackenzie River at Fort Simpson, 300 miles away. Once the Mackenzie is entered the boat makes several stops at places like Wrigley, Norman and Good Hope until it reaches 845 miles still farther north.

If you'll take a good look at your atlas you'll find that Aklavik is on the Mackenzie about an inch below the Arctic Ocean (called the Beaufort Sea at that point) and just across the border from the fabulous Yukon Territory. Aklavik boasts a population of over 3000 souls and is probably the metropolis of the area. Predominant population is Eskimo although the mine operators and many of the workers are Canadians or Americans. The ever-trusty atlas tells us that the total population of the region is less than two per square mile which means that if they buy a good portion of a car of oranges the per capita consumption is pretty high.

Aklavik, however, is not the end of the line for this shipment of oranges. From that point the fruit is distributed in practically all directions, going as far as Coppermine, over 700 miles east on the shores of Coronation Gulf. If you have as much trouble finding Coppermine as I did, give up. Perhaps the atlas you take from doesn't list it, but if you must have it spotted for you, drop me a line. Interesting thing is that it's just north of the radium mining area.

We are inclined to consider Edmonton as pretty far north and it is, but this fruit went 2700 miles past Edmonton before reaching its final destination. Edmonton is about 1700 miles from Los Angeles so it was less than half-way when it was accepted by the Edmonton jobbing firm.

The real punch to the story is the fact that people on the shores of Arctic waters wanted oranges enough to go to all the trouble and expense to get them there. Exchange growers, through their advertising and sales promotion programs, have been working effectively to increase the consumption of citrus fruits. The volume of oranges consumed by the citizens of Aklavik and Coppermine isn't large but when those examples are multiplied by thousands through widespread distribution, the volume looms large. We'll need that volume and more in the future.

DO YOU REMEMBER ?



When oranges were hand-washed and wiped dry with towels? And when paper wraps were unknown? This is an early day orange grading scene at the Placentia Orange Growers Association. It would seem the fair sex had not yet invaded the citrus industry.

Poet Sings Praises of Citrus Fruit

English poets have sung of "ships and shoes and sailing wax and cabbages and kings." Now a contributor to the *Manchester Guardian* comes up with an ode to citrus fruit. With poetic license, he makes the efforts of the most imaginative copy writer seem mild.

Panacea

(A dietetic expert says that the prevalent feeling of frustration and irritation is entirely due to the prolonged shortage of oranges, lemons, and other citrus fruits.)

Does the world seem drab and dreary, a perverse and cheerless spot? Are you feeling frail and weary? Has your temper gone to pot? You would like to get a gun, perhaps, and run amuck and shoot? Well, the answer is a lemon—or the absence of that fruit.

O you mustn't think frustration is confined, my lad, to you—'Tis the common situation of our scurvy island crew, For the citrus fruit is lacking, but when that once more is rife We shall all, no doubt, get cracking on a better way of life.

Then, rid of doubts and animus and cleared of all caprice, U.N.O. will glow unanimous with plans for perfect peace; With cares dispersed like bubbles as the citrus fruit is pressed The French will solve their troubles and the Persians be at rest.

Let us seize this grand specific and march gallily on our way To the vision beatific of an unfrustrated day When the world sits cleansed from conflict and removed from grief and guile, Sucking oranges and lemons with a cosmic, carefree smile!

LUCIO.



Figures released by 46 California nurseries reveal there have been set out between 4000 and 4500 acres of citrus fruit this year. By variety, 69 percent is oranges, 23 percent lemons, and the balance grapefruit. There were more than three times as many valencias set out as navels.

Text of a full color page appearing in a recent issue of the *American Weekly*, Sunday magazine supplement, featured "vitamines," the unknown wonder element of food, about which so much is being written at the present time and which occur so plentifully in oranges and lemons.

Fifty thousand copies of a broadside describing the new 1921 model Electric Orange and Lemon Juice Extractor have recently been mailed to leading soda fountains in the United States.

From Messina, Sicily comes word of the formation of the "Anonymous Co-operative Society Amongst Citrus Industrials of Sicily and Calabria." Object of the organization is to promote citrus essential oils, oil of lemon, etc.

Stephen Farrand Returns

Lieutenant Colonel Stephen M. Farrand returned to Los Angeles on 30 April on terminal leave, with plans to rejoin the law firm of Farrand & Farrand, general counsel of California Fruit Growers Exchange, in the near future. He served in the Provost Marshal General's Office of the War Department from December 20, 1942 until April 4, 1946. At the time of his release he was serving as Deputy Director of the Prisoner of War Operations Division. That Division had charge of the internment, labor and repatriation of enemy prisoners of war held in the United States. Col. Farrand received the Army Commendation Ribbon, and later an Oak Leaf Cluster thereto, designating a second award of the Commendation Ribbon.

Agricultural Economist Declares Price Control Value Highly Overrated

DR. F. A. PEARSON, professor of prices and statistics at Cornell, believes that the effectiveness of the ceiling-support-subsidy programs has been greatly over-rated. "There is a tendency," he says, "to estimate their effectiveness by the margin between the present level of prices and the runaway spiraling inflation which it is assumed would have occurred had

there been no ceilings. Skyrocketing inflation has occurred in the past, only in countries defeated and ravaged by war, torn by revolution, or thrown into monetary chaos," he declares.

"Countries with like currencies have like price levels. Our prices of wheat, cotton, potatoes, milk, and the like, have fluctuated with the world price level. This has been true despite wars, depressions, tariffs, and support and ceiling price policies.

Professor Pearson points out that "the subsidy-ceiling-support price program treats a symptom, and that price is merely a symptom." He calls ceiling prices "sedative, not tonic" and contends they neither cure inflation, nor immunize the nation against it.

"If prices got us what we wanted in time of war (food and munitions), why not pursue the same policy, price incentives, in times of peace?" he asks.

In discussing a free price system, Pearson declares "sooner or later the farmer must decide whether to continue down the regimented path or return to a free economy."

The Exchange Lemon Products Company of Corona, Calif., has perfected a method of increasing palatability of dried citrus pulp when used as feed for livestock . . . adding anhydrous ammonia to the pulp. This also raises the digestible protein from three to nine per cent.



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NEWS of INTEREST to CITRUS GROWERS

When the Goleta Lemon Association met recently for the annual meeting J. M. Rutherford was chosen president. Others were: R. S. Rowe, vice president; Egisto Giorgi, secretary.

The Camarillo Citrus Association recently met for the annual meeting and elected A. Camarillo, president; H. G. Lytle, vice president; J. M. Arneill, secretary-treasurer.

A. J. Schutte, president; LeRoy E. Lyon, vice president; A. E. Hughes, secretary-manager, were elected at the annual meeting of the Olive Heights Citrus Association.

Farmers must consider the production of non-perishable crops unless they can get some Government protection against strikes just at harvest time . . . says Ray Wiser, president of the California Farm Bureau Federation.

The Fillmore Citrus Association has undertaken the expansion of their plant, and require about a third more employees.

The Whittier District Fruit Exchange met and elected H. A. Schuyler, president; E. M. Wheatland, vice president; Orrin Gallup, treasurer; U. S. McWhorter, secretary-manager.

R. L. Willits, president; W. A. McIntosh, vice president; E. L. Toolen, treasurer and secretary; R. L. Hampton, manager, are the new officers of the Corona Foothill Lemon Company.

A. B. Wilmsen was elected president of the Placentia Mutual Orange Association. Others elected: C. C. Wagner, 1st vice president; C. J. Mauerhan, 2nd vice president; Robert Dowling, treasurer-secretary-manager.

Following are the newly elected officers of the Anaheim Citrus Fruit Association: President, L. P. Halderman; Vice President, N. C. Christensen, and Secretary-Manager, Glenn A. Hipes.

E. M. Wheatland has been chosen president of the Whittier Select Citrus Association. Also serving with him are F. W. Korsmeier, vice president; George E. Triggs, treasurer; John E. Reed, manager and assistant secretary.

The Ventura Citrus Association elected Sydney L. Graham president; Collins Flint, vice president; Richard B. Gould, treasurer; Arthur S. Bryant, secretary.

The Goleta Lemon Association shipped 317,775 packed boxes during the past season.

By a vote of more than two to one the employees of the La Verne Orange Association rejected a proposal that they be represented as bargaining agent by the Produce Drivers and Employees union local No. 630, A. F. of L.

At the annual meeting of the Sweetwater Cooperative Citrus Association, Richard M. Allen was elected president. Other officers are: De Witt N. Williams, vice president; A. F. Wagner, Jr., secretary-treasurer; G. Embleton, manager.

Mr. E. F. Damon, manager of the Camarillo Citrus Association since the organization was started in 1932, has retired. Mr. W. H. Miller has taken his place.

At the annual meeting of the Azusa Citrus Growers Fruit Exchange C. A. Griffith was named president; Chas. F. Gordon, vice president; P. H. Brecht, secretary-manager.

R. O. Price was elected president of the Ontario-Cucamonga Fruit Exchange for the coming year. Serving with him are: Glen Shepherd, 1st vice president; P. R. Daggs, 2nd vice president; H. B. Harlow, treasurer, secretary-manager.

The La Verne Fruit Exchange named the following officers for the coming year: President, L. E. Cree; vice president; R. L. Davis, treasurer, secretary-manager, E. P. Jochimsen.

R. Keith Walden, John Curci and Louis A. Turner have purchased 74 acres of lemon land near El Rio from Robert S. Livingston.

The Riverside-Arlington Heights Fruit Exchange announced the following officers for the coming year: President, J. N. Irving; 1st vice president, K. I. Marshall; 2nd vice president, H. Hudson; treasurer, secretary-manager, H. A. Lynn.

C. W. Richardson, president; E. B. Chambers, 1st vice president; L. A. Warren, 2nd vice president; treasurer-secretary-manager, C. E. Groninger are the new officers of the Glendora Fruit Exchange.

Mr. Wm. A. Kilby, of the Export Division of the Products Sales Department of the California Fruit Growers Exchange, spoke at the annual meeting of the North Whittier Heights Citrus Association on the importance of gaining good will with other nations. He said that continued exports of citrus products was important in accomplishing this end.

The Walnut Fruit Growers Association have named George C. Wheeler president; Roy M. Fryer, vice president; Fred A. Dyer, secretary-manager, at the annual meeting.

The Riverside Heights Orange Growers at their annual meeting elected O. L. Braucher, president; J. H. Gobreuge, vice president; Charles W. Ricker, secretary; H. Hudson, manager.

Harry Gordon, president; vice president, C. F. Hassheider; Stanley F. Trueblood, treasurer, secretary-manager . . . elected at the annual meeting of the Covina Fruit Exchange.

The Claremont Citrus Association has chosen the following to serve for the coming season: President, Frank W. Ford; 1st vice president, R. L. Knox; 2nd vice president, R. K. Pitzer; secretary-manager, M. E. Henderson.

At the annual meeting of the Orange Heights Orange Association, Corona, R. L. Hampton was named president-manager. Also serving are: P. J. Weisel, vice president; Paris Adams, assistant secretary; D. H. Kelley, secretary-treasurer.

At the Crafton Orange Growers Association annual meeting, which was also the 40th anniversary of the organization, the following officers were elected: President, Winslow S. Lincoln; vice president, I. E. Mills; Miss L. Glasgow, secretary; Gordon Cram, treasurer-manager.

R. O. Price was elected president when the Upland Heights Orange Association held their annual meeting. Also elected were William Springer, vice president; E. C. Rosenberger, treasurer, secretary-manager.

When the San Dimas Fruit Exchange met for the annual meeting they elected J. J. Maechtlen as president; A. L. Stevens, 1st vice president; H. W. Montgomery, 2nd vice president; George H. Swindells, treasurer, secretary-manager.

O. W. Maulsby was elected president of El Rancho Citrus Association in Rivera at the annual meeting. Others serving are: William L. Houghton, vice president; George E. Triggs, treasurer; C. W. Robinson, secretary.

R. K. Pitzer has been named president of the West Ontario Citrus Association. Those serving with Mr. Pitzer are: George W. Roe, 1st vice president; P. H. Brown, 2nd vice president, and W. L. Birkel, treasurer, secretary-manager.

The Rivera Citrus Association at their annual meeting chose the following to serve for the coming year: President, Osburn Burke; vice president, A. R. McGregor; Carl E. Monahan, secretary-manager.

George A. Klusman was elected president at the annual meeting of the Cucamonga Citrus Association; William Cooper, vice president; Effie Brown, treasurer and secretary; E. B. Bogart, manager.

Indian Hill Citrus Association at their annual meeting elected as president, Ross J. Wright; vice president, J. E. Crawford; R. B. Denny, secretary and manager.

Edward F. Bartlett was named president at the annual meeting of the El Camino Citrus Association. Others chosen were: Iral J. Roller, 1st vice president; T. J. Straley, 2nd vice president; Boyd Craig, secretary-manager.

The Semi-Tropic Fruit Exchange at their annual meeting named L. P. Fuller as president; 1st vice president and treasurer, C. J. Pegler; 2nd vice president, A. G. Heming . . . and J. Carl Crouch, secretary-manager.

The newly-formed Redlands-Highlands Pest Control Association has named Elmer M. Mitchell as manager. Mr. Mitchell will continue for a time his duties as manager of the Redlands-Highlands Farm Labor Association.

John Folting of Arcadia is now owner of an 8½-acre orange grove in Monrovia, purchased from Charles A. Ferrell.

When the National Orange Show Corp. met recently with the board of directors, Lt. Col. Fred B. Mack was elected president. Others are: Raymond H. Stockwell, vice-president and Russell Z. Smith, secretary-manager. Another election will be necessary on June 30 . . . the end of the fiscal year. All indications point to the Orange Show being resumed in 1947.

Ralph G. LaRue, assistant farm advisor, will direct a three-year study, in cooperation with growers of Upland, Ontario, Cucamonga and Alta Loma, to determine the relative value of spraying oranges and lemons with three of the so-called minor chemical elements. Several test plots are being established in these areas.

The Glendora Lemon Growers Association recently signed up as a member the Corona Foothill Lemon Company with 200 acres of lemons. They also signed up additional acreage in the Arlington district that adjoins another large block of lemons already being handled.

(More Notes on Page 326)



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Hearings

(Continued from Page 294)

In behalf of the citrus industry the following prepared statement was given by F. R. Wilcox, of the California Fruit Growers Exchange:

The citrus industry in California and Arizona is fully aware of the fine contributions which have been made by Congressman Harry Shepard and Congressman John Phillips.

During the war period many restrictions and regulations have been essential. It is now hoped that such wartime measures will be discontinued as rapidly as is consistent with a sound reconstruction program.

Citrus growers are not unmindful of the job ahead. Citrus production has increased rapidly and a wartime demand for foods, together with the scarcity of many products, have made possible quite satisfactory returns. With normal demand conditions, it will be essential to conduct a vigorous sales program for fresh citrus fruits and for citrus products in order to keep satisfactory prices. In this connection we recognize the importance of full employment and reasonable wage scales.

Aside from the general overall programs, we are listing here some of the matters now pending before the Congress which directly affect the citrus industry. Your support and attention to these matters is respectfully solicited.

1. Senate Bill 1990 which adds a new section to the National Plant Quarantine Act. This bill is now before the Committee on Agriculture and Forestry in the Senate and was introduced by Senator Thomas of Oklahoma. It restricts the quantity of nursery stock coming from foreign countries to that needed for propagation purposes and to the quantity which may be properly inspected by the inspection services. No appropriation is required.

2. HR 6042, Extension of the Emergency Price Control Act of 1942. We take no position for or against continuation of the Act but support specifically the amendment offered by Representative Gossett of Texas relative to agricultural commodities. This amendment passed the House by a roll call vote of 228 to 166. The amendment is described in the Congressional Record of April 17, 1946, page 4011, and we are particularly interested in Section 4 which reads as follows:

"(4) (a) In the case of agricultural commodities the Secretary of Agriculture is hereby authorized and directed to make a determination as to whether supply of the commodity is equal to the domestic consumption of such commodity. When such supply is equal to such domestic consumption, he shall forthwith certify such determination to the Administrator. The Administrator shall within 10 days thereafter remove all price ceilings with respect to such commodity.

"(b) When the production of any agricultural commodity for the past 12 months equals or exceeds the production of this commodity during the 12 months period from July 1, 1940 to June 30, 1941, then such fact shall be certified to the Price

Administrator by the Secretary of Agriculture, and such Price Administrator shall not later than 10 days after the receipt of such certification remove all maximum price ceilings from such commodity and all commodities for human consumption derived principally therefrom."

3. HR 5496, To Amend the Provisions of the Agricultural Adjustment Act relating to marketing agreements and orders. This bill on which partial hearings have been held by the House Agricultural Committee would permit marketing agreement programs to continue to exercise certain powers which do not restrict the supplies going to market at such times as prices may be above parity levels. It particularly authorizes industries operating under marketing orders to continue to collect assessments for purposes of maintaining the organization, and to carry on grading and inspection for the protection of producers and consumers. This industry has no objection to the request of the dairy industry that they be exempt from the new provisions, and we have taken no position with respect to addition of new commodities as long as such additional authority does not jeopardize other portions of the Act and does not jeopardize marketing orders and agreements which are now effective under the Act. No appropriation is required.

4. HR 3370 which reappropriates funds for the purpose of purchasing agricultural commodities for school lunches. This program is conducted for the purpose of assisting agriculture and at the same time improving the diets of school children throughout the country and without reference to political gain it can be of material assistance. At the present time approximately 300,000 gallons of orange concentrate originally purchased for Lend Lease is being utilized. The citrus products market has strengthened as a result of this action. It would seem that the normal funds provided by so-called Section 32 which appropriates 30% of the tariff revenues would be sufficient to conduct these programs. No new appropriation is required.

5. Agricultural Appropriation Bill. Definite information is now available pointing to the fact that a disease commonly known as Tristeza has wiped out large sections of citrus producing areas in South American countries. The Department of Agri-



culture has been requested to study this disease in South America to the end of determining its method of transmission, controls, and prevent its spread into this country. For this purpose the Bureau of Plant Industry requested a budget of \$27,500 and this amount was approved in the House of Representatives. An additional amount of \$35,000 for the Bureau of Entomology and Plant Quarantine was approved by the Bureau of the Budget but was disallowed in the House. It was urgently requested that this amount be restored in the Senate in order that the phases of this work as described hereinabove can go forward immediately. There has been considerable concern that the Department of Agriculture would not proceed vigorously with this project. It is our feeling, however, that the very nature of the work with its international aspects and quarantine aspects requires it to be done by the Federal Department of Agriculture.

6. Agricultural Appropriation Bill. Appropriation for fruit and vegetable chemistry laboratory located at Los Angeles. In order to do some specialized research work in connection with citrus products, an amount of \$15,000 for the Los Angeles laboratory was requested and was approved by the Bureau of the Budget of the Department of Agriculture. This was reduced to \$7,500 in the House. The original amount should be restored in the Senate in order to permit the employment of personnel and carry on essential projects which will improve the output of citrus products. The regular appropriation for the Los Angeles laboratory is \$27,333. We believe that this request for the increased amount is well within the requirements for research which is being conducted on other products.

7. Without specific reference to any legislation, it is the sincere desire of this industry that the national debt be reduced and that the finances of this country be kept on a sound basis.

8. Protection of water supplies for all agricultural districts in this area is of vital importance.

Co-ops Vital to Agriculture, Secretary Says

Few people are better informed about American farmers and their problems than the Secretary of Agriculture. In a statement before the National Council of Farmer Cooperatives in Chicago, Secretary Anderson said:

"Large corporations probably would have taken over as much of agriculture as they have of other parts of our economy, if it had not been for the growth of cooperatives and government encouragement of family type farms." He added, "Cooperatives are the very essence of free enterprise. They are groups of independent farmers banded together to do some job too big for them as individuals."

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The Trees Can Tell You

By KENNETH M. SMOYER

Mr. Smoyer is assistant farm advisor in Los Angeles County, specializing in citriculture.

AN orchard tool too seldom used by citrus growers is an experimental plot, or perhaps several of them, to demonstrate whether or not changes in orchard management practices could be made to advantage.

It is well known among farmers that no one management program will be satisfactory on every farm. Variations in soil, water, climate, variety, quality and age of trees, are some of the features which add complexity to the problem of an efficient orchard management program.

The need for a more effective management program is strongly indicated in the rapidly expanding citrus production of the United States. Increased acreages in other citrus producing states and costs of production lower than that in California make it imperative that our own citrus farmers learn to produce more fruit per acre of better size and quality. Moreover, this improvement in production must be accomplished with reduced costs per packed box—that's the pay-off.

While there is still much to learn about how to increase production and quality of fruit, the over-all efficiency of the average citrus orchard can be improved—otherwise it wouldn't be average. Improvement in efficiency does not necessarily mean reducing costs. There are many cases in which growers can spend an extra dollar and increase their returns by more than a dollar. That's good business. Therefore, it is desirable that growers experiment on various phases of their orchard management in an attempt to find what, for their conditions, is the least amount that can be spent on any particular operation or combination of operations which will produce the most fruit of the best quality.

Soil analyses and advice of so-called experts is not the final answer to improved efficiency in orchard management. These sources of information may act as guides to the grower in adjusting his program. But no matter what information the grower obtains from these sources, it will still be necessary for him to "try it on the dog" to find out what the most efficient program might be for his particular soil and location.

Every grower would find it to advantage to study the commonly accepted practices, such as more or less water, straight furrows, cross-checked furrows, and flooding. Such experiments are particularly helpful on light soils of low waterholding capacity and on the heavy soils which always retain a high percentage of moisture.

The exact quantity of nitrogen per tree necessary on a given piece of ground can only be determined by relatively long time experiments. The value of phosphate and potash, if any, can only be determined by experiments in each orchard. So it goes with all phases of orchard management.

In conducting experimental trials it is advisable to use a small block of trees in preference to making a change over the entire orchard. Such changes should be carried on and watched for at least five years before being abandoned. With irrigation, for example, results of a change in practice may not become evident until two or three years after the change has been made.

In laying out an experimental orchard block it is best to make it conform to picking sets. Thus the grower has an opportunity of watching the picking on his experiment to determine any appreciable changes in quality, size, or production.

Blocks of at least ten trees, which are about average for the orchard, should be used. A larger number, or repeated plots over the entire orchard, is, of course, more scientific. For practical purposes, however, one experiment on a block using the average soil and the average trees of the orchard should be enough to give the grower reliable indication of results. These plots should have on all four sides of them one row known as a "guard row" to which no treatment is given. The guard rows will isolate the plot from other trials which may be under way in the orchard.

The most important principle to follow in conducting experiment plots is never to make more than one trial on a particular plot. For example, if the experiment is method of applying water, nothing else should be done to that plot which is different from the general handling of the orchard. If it is a plot to determine the amount of nitrogen needed, be sure that the plot differs from the general orchard practice only in the amount of nitrogen used. If more than one change is made it will be impossible to determine which one caused the result.

Orchardists will be wise to be particularly cautious in the use of new systems and new materials. Many persons are searching for magic curealls to solve their problems. Any salesman who comes along with a new product which he claims offers such responses has a "sure ear" in such people to the extent that many thousands of dollars are wasted each year in the purchase of useless or unneeded materials. (One chap, without ever seeing an affected tree, has devised a "sure cure" for quick decline of sweet oranges!).

It is poor economy and poor orchard management to put many odds

and ends of so-called mystic materials on orchards in the hope that some benefit might be achieved through their use. New systems and materials should, of course, be given a trial, but on a small scale until proved of value or found useless.

The above argument should not be construed to mean that every grower should divide his orchard into a maze of experimental plots. It does mean, however, that after the grower has given careful consideration to each one of his orchard practices there may be one or two open questions indicated which would justify some experimenting.

If, after watching the plots over the period of the experiment, the grower can not observe any changes, an alteration of his orchard practice is certainly not justified. The grower must remember that changes in orchard management practices could prove harmful instead of beneficial. The big problem the grower has, therefore, in sizing up his plots is to be certain that he is observing accurately, not wishfully. To substantiate his own opinion he would do well to call in competent observers among his neighbors and the professional field men to see if they can pick out the plots where his experiments were located. The trees will tell the story—but sometimes it takes pretty good judgement to decide what they have to say.

Maximizing Food Supply for Famine Countries

AT a time when farm production is at a peak level, continued food subsidies merely serve to create demand for food which cannot be satisfied and thus to set the stage for black markets," John H. Davis, executive secretary, National Council of Farmer Cooperatives, said recently, commenting on the drive for food for famine area relief.

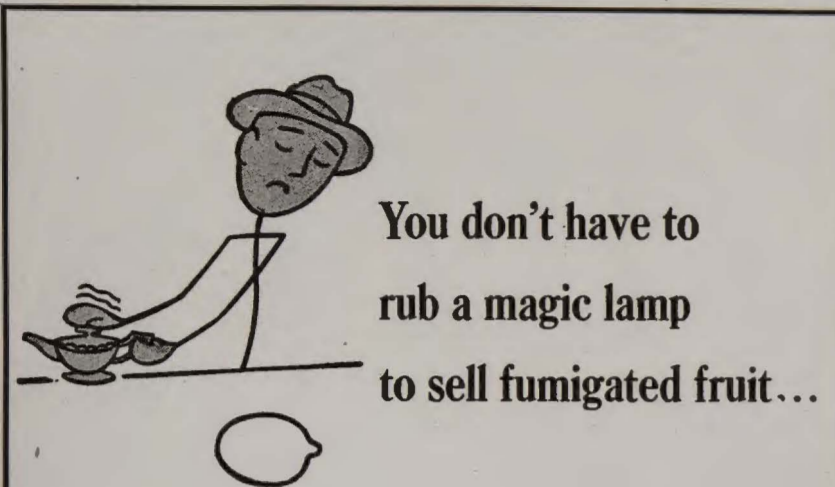
Davis pointed out that "production of such subsidized items as wheat, meats and dairy products cannot be increased in the next year or so to the point of satisfying demand at existing ceiling prices. The country is not in position to bring about orderly distribution through rationing. Therefore, the only feasible means of bringing supply and demand together is to allow the prices of such food items to reflect the balance of supply and demand. Such adjustments will also reduce the wasteful use of cheap food and channel the slaughtering of livestock back into channels where by-products such as hides, hoofs, bones, blood, and fats will be saved.

Davis further stated, "To the extent that black markets exist or develop the consumers do not benefit from food subsidies—the principal benefactors become the black market operators. The consumers not only have to pay the black market price, but also make up the subsidies and cost of administration in increased taxes. Black market operators could not exist except for demand being out of balance with supply. If such lack of balance were the result of ab-

normally small production one might argue that we should struggle through until such time as supplies catch up. But food production is at an all time peak and is not likely to increase. Therefore, the only prac-

tical means of bringing about a balance is to bring demand in line with production. This can best be done through price adjustments. Such adjustments will not mean hunger to Americans nor will it mean excessive

prices. It will mean better distribution of foods, a reduction in food waste, increased food production, and a throttling of black markets. This will also mean maximum food for foreign relief.



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This material was presented originally on K F I, April 24, on the Noon Farm Reporter Program, Mr. Howard A. Miller, manager of the Agriculture Department of the Los Angeles County Chamber of Commerce, being interviewed by D. M. Rutherford.

Our agriculture is much different now than it was in 1940—What were the most marked changes in the agriculture of Southern California during the recent war years?

Some significant changes were brought about by a number of factors: Shortage of labor, farm implements, insecticides and fertilizers, transportation limitations, military demands, increased population and other changes in market requirements, all had their effect.

Our vegetable industry was influenced by the removal of the Japanese, who previously dominated much of our market garden produc-

Our Changing Agriculture

tion. Their withdrawal resulted in other farmers quickly moving in to produce many types of vegetables. In fact, these new operators helped give us a larger wartime vegetable production than was had before the Japanese were withdrawn.

Was this true of berries?

No, berry production was almost a monopoly of the Japanese. For instance, strawberry acreage in 1940 was over 2 thousand acres and it was less than 400 at the end of the war.

Tell us what happened to other crops.

All right. First—deciduous fruits: Our acreage of apricots, peaches and other deciduous fruits was generally on the decrease prior to the war and was further curtailed between 1940

and the present time. The same trend continued with walnuts. I have already mentioned strawberries, but bushberries also were sharply reduced in acreage. Here is a crop, by the way, which offers some good possibilities for efficient growers: Not only is there an active fresh market demand but it has high potentiality for quick-freezing.

You have already spoken of vegetables in a general way. Can you tell us something more specific?

Crops like spinach, squash, dry onions, cabbage, sweet potatoes, Irish potatoes and green beans, were produced on larger acreages as the war progressed. On the other hand, cantaloupes, celery, and chili peppers decreased.

You can see from this picture a

tendency to stay with the crops that require lesser amounts of labor and avoiding those where a great amount of hand work was involved.

Southern California is noted for its intensive agriculture but we have sizable acreages of field crops. Let's discuss them for a moment.

The barley acreage was substantially increased, while wheat was down about one-third. Dry lima bean acreage held its own but other dry beans were curtailed about 30 per cent.

The unfavorable prices for sugar resulted in sugar beet acreage being cut to just about one-third of its prewar figure. . . . Unavailability of seeds offered an opportunity for Southern California farmers and there was a healthy expansion in these crops.

We have covered the three general classifications of crops, that is, fruits, vegetables and field crops. That leaves us with the livestock industry to be accounted for.

It might be hard to convince consumers who were unable to get that extra bottle of milk but we actually stepped up our dairy production in Los Angeles County by about 20 per cent during the war period, and held about even in the rest of Southern California. All this production, of course, was for the fresh milk market and shortages resulted from increased consumer demand and lack of supply coming in from outside areas.

We doubled our chicken and turkey production in Southern California and stepped up our egg output by two-thirds. On the other hand, sheep and lambs were reduced twenty per cent.

That gives us a review of what happened to Southern California's agricultural production during World War II. There were some important changes in the supplies of food for the Los Angeles Metropolitan area, as any housewife will testify.

The outstanding development was the increasing distance which Los Angeles had to go for its food requirements. The large influx of war workers, the many military personnel who were quartered and fed in our local area, and increased buying power, with consequent stepping up of per capita demand for food products, resulted in Los Angeles reaching not only beyond its immediate area but far beyond Southern California into the whole Pacific Southwest, and even still farther, to the areas East of the Rocky Mountains, for much of its food supply.

We ordinarily think of most of our fruit and vegetable requirements coming from the local area. In 1940, the Los Angeles area did supply 48 per cent of this city's receipts of fruits and vegetables. In 1945, however, this percentage had dropped to 38 and we were going outside California for 18 per cent, as compared to 13 per cent prewar.

Butter continues to be a touchy subject. Let's see where we stand on this desirable item.

Los Angeles has not produced any appreciable amount of butter for several decades. We previously have gone to Idaho, Utah, and other Western States for much of our requirements. Whereas, California was furnishing 35 per cent in 1940, less than 4 per cent of our Los Angeles receipts came from within the State in 1945 and one-half came from east of the Rocky Mountains. Of course, our total supplies were much less in 1945 than five or six years previously.

We have a lot of our farmers engaged in poultry production throughout Southern California but this does not begin to take care of our egg needs for our increasingly large population.

That is true. Here, again, we are going farther and farther afield for our requirements. In 1940, California supplied over three-fourths of the city's egg receipts and in 1945, less than one-third. Here, again, we are going beyond the Rocky Mountains for almost one-half of our needs.

It seems quite clear, from what you have said, that our Southern Cali-

Quality Fruit— On Order

FRUIT growers will need to concentrate more on producing quality fruit.

The prospects of fruit crops in California this year are excellent, but it is still too early to hear from outside areas where trouble sometimes develops with late spring frosts and bad weather at pollinating time.

Reports of the State Fruit Reporting Services indicate about one-tenth more deciduous fruit production nationally this year than last year, assuming about average conditions will prevail in all parts of the country for the remainder of the season.

There will be fewer peaches, pears, grapes, prunes and plums, but the outlook indicates that one-fourth more cherries and that at least a tenth more citrus will be produced. Nearly twice the apple crop of last year is indicated.

During the war, with prices comparatively high, most commercial growers took good care of their orchards, put on more fertilizer, and got high acre yields, except where spring frost and poor pollination weather lowered the set of fruit.

Our wartime production of fruit was bigger than four years before, above the average, and greater than any previous four years' production on record.

Comparatively favorable prices and wartime demands for fruit resulted in the marketing of much low-quality fruit. With the return of more normal purchasing power in the future and greater competition, fruit growers will have to concentrate more on producing quality fruit.—Ralph G. LaRue, Asst. Co. Agt., San Bernardino.

fornia's agriculture and food supply have been materially influenced by the war. Apparently most of the folks who came to work here in war industries are still with us and more population is coming. What does this mean, insofar as future effects on our agriculture are concerned?

Our agricultural production can generally be divided into two classifications, that which is produced for shipment to out-of-State markets, and

that which is needed for local consumption. There is, of course, much overlapping in the fruit and vegetable field, particularly, but all of our Southern California outputs of dairy and poultry products, market garden vegetables, and some other items, is determined by the size and buying power of our local population.

Between 1940 and 1946, Southern California's population increased

1,200,000. Can we translate this into local demand for agricultural products?

It means that we can sell locally the product of 700 acres of apricots, 1000 acres of peaches, 2500 acres of oranges, and 24,000 acres of vegetables, including potatoes. Likewise, it means an additional market here at home for 300,000 turkeys annually, eggs from 2,500,000 hens and fresh milk from 36,000 cows.

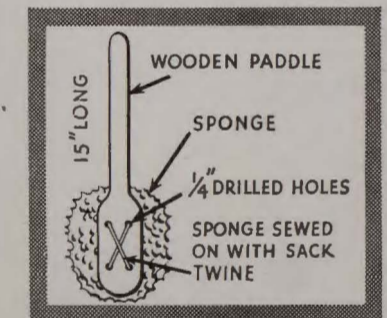
STANDARD FARM SERVICE NEWS



VOL. IV NO. 5 ISSUED MONTHLY by STANDARD OF CALIFORNIA JUNE • 1946

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ONE of the very pleasant features of editing this trade journal of the citrus industry is the pleasure of meeting, now and then, a citrus grower from some far corner of the world, South Africa, Australia, China, Brazil. Lately this pleasure was trebled by the visit to our office of three gentlemen from the Near East, citrus growers in Palestine. They included Mr. Joseph Jacobson, Director of the Farmers' Federation of Palestine, Mr. Benjamin Gorstein, agronomist and manager of "Yakhin" and "Hakal" (Plantation Dept.) and Mr. Moshe Gohelf, head inspector of Pardess Cooperative Society of Palestine.

Mr. Jacobson was born and reared in Palestine, his great-grandfather being one of the first of the Jewish farmers who settled in the country some ninety years ago. Mr. Gohelf came to the country as a child and Mr. Gorstein came from Russia about 20 years ago.

Notes from the Near East

By D. M. RUTHERFORD

These men were sent by the citrus growers of Palestine, with the consent and help of their government, to study citrus production in the United States. They expressed their deepest appreciation to Mr. L. C. Pinkerton, U. S. Counsel General in Jerusalem, who communicated with our State and Agriculture Departments and handled many details in connection with their visit.

The citrus industry of Palestine suffered a serious setback during the war years and our visitors hope they will be instrumental in helping to bring it back to normal. They are particularly interested in our methods of soil management, mechanization, packing and storage. Non-

tillage especially interested them and they are determined to try it out under their own orchard conditions. Most of the orchards in Palestine are planted 12' x 12' or 12' x 15', many orchards having as many as 200 trees per acre. One of their needs is a low-built, powerful tractor that can be used under these conditions.

During the war years exports were nil and no fertilizers were available. Growers had no income. The government has provided loans to help maintain growers and has established a Citrus Control Board, made up of industry and government officials, and having sub-committees for handling management, financial and pest control matters. There is also a

Marketing Board, which is the only agency authorized to export citrus fruit—the industry is highly dependent upon the export—and controls the business side of the industry within the country. These bodies are now facing the problem of reorganizing their citrus industry, and our visitors expressed themselves as being vitally interested in learning all they could about cooperative marketing as practiced in the Southwest. At present only about 25 percent of the citrus growers are organized cooperatively, that is, about half of the Jews and none of the Arabs, the citrus acreage being held about equally between the two racial groups.

The area of citrus fruits in Palestine is around 65,000 acres, there having been some loss during the war in marginal soils and through absence of owners. The groves are "a bit hungry now", but they are expected to be back to normal in two to three years. Pre-war exports were 17 to 18 million cases (100 lbs.) but production is now 9 to 10 million cases. Good groves normally yield 400 to 500 cases per acre.

Varieties grown are primarily the Jaffa and Shamouti accounting for about 80 percent of the production; 7 percent Marsh seedless grapefruit, 7 percent Valencia oranges and the balance is composed of lemons, tangerines and odds-and-ends. Navel oranges are not grown commercially.

For the most part, citrus orchards are held in private ownership and 80 percent of the holdings are of less than 10 acres. There are a few orchards of 100 acres and the largest is about 200 acres in area. Growers do not live on their orchards, but reside in agricultural settlements usually within a few miles of the properties.

Planting of new citrus acreage is now prohibited by law in the practical belief that there is no reason for growing more fruit than markets will take. If markets can be expanded and uses made of citrus products it is possible that this law may be relaxed in the future.

Production methods in Palestine are, in many ways, similar to ours. Soils, generally, are lighter than those in California, but not essentially different. Winters in Palestine are warmer than those in California, and no orchard heating is used. Summers are somewhat hotter. Irrigation is ordinarily in basins, although furrows are used in some instances. Most of the irrigation water is pumped from wells. The pumping equipment is practically all of American make.

The most distinctive difference between the practices in our respective countries is in packing. In Palestine the fruit is picked and immediately packed, with little or no machinery being used.

Our visitors expressed the hope that there can be international understanding and agreement in the citrus industry as world trade becomes normal and business again becomes competitive. Organized and civilized

competitors are so much better to deal with than the un-organized, wild ones. Prior to the war there was some understanding with grower groups in Africa and other British Dominions.

Then, as it must to all men, be they from Pittsburgh or Palestine, came the question: "Well, what are your impressions of California?" All three men smiled very pleasantly. Mr. Jacobson said seriously: "You would have to go out of your country to appreciate what you have—as one never realizes he has a heart until something goes wrong. The thing that impresses me here is the universal freedom, happiness. People are relaxed, free, happy, even joyous. I was in England a month ago. The contrast is marked. In years past I have been in every important city in Europe, and have traveled widely. As a Palestinian orange grower, and somewhat successful in a business way, I have seen no way-of-life in Europe that I could envy, but in your life here, there is much to admire, and I might say there are some things about it that I would envy—life is better here than anywhere else in the world today.

"We are so pleased with your cordial hospitality. Many of your men have gone out of their way to help us, they have spent hours, and even days, showing us your methods and practices—Mr. Wilcox, Mr. Hodgson, Mr. Smoyer, Mr. Johnston, Mr. Frost, and many others, here and in Washington, have been so gracious and helpful to us. . . . And if you mention our visit in the Citrograph, please be kind enough to express our great appreciation of the services of Mr. Pinkerton, your able representative in our country—he's been sort of a God-father to us."

Yuma Citrus House New and Different

MIGHTY proud they are, down Yuma way, of that spanking new Yuma Mesa Fruit Growers Assn. packing house. That same modern, airy building, just completed, also houses their juice cannery.

Most striking feature, perhaps, is their method of receiving fruit as it is hauled loose, in open trucks, from the groves 12 and 14 miles away. There's nothing like it in any other Arizona house. An incidental result is that more grapefruit is visible than in any other house. Tons and tons of it! Thousands and thousands of yellow globes, rolling along over drapers and belts and graders and sizers to the packing tables.

Arizona Farmer for March 9 told how and why the use of citrus field boxes has been discontinued on the mesa. The Association's pickers empty fruit into a hopper at the rear of a truck. An elevator hoists it into the body, which has hinged side-boards.

This necessitated an entire change of procedure at the packing house.

Manager Harry Ellis and his associates worked out a system which saves almost as much labor there as it does in the orchard.

Each truck, as it arrives, halts by one of two drapers made of wooden slats. Each draper is 17 feet wide and travels at any speed desired, usually very slowly.

As the side-boards are raised the grapefruit spills out on the draper. The draper elevates it to a moving

belt about 5½ feet off the floor. Then the belt carries it along to other belts and gates and machines. In just a few minutes the by-products fruit is out in the cull bins while that of proper sizes and grades is being tugged into shipping boxes.

Naturally, there were some bugs to be ironed out at first. March was well along before everything was operating with smoothness. Now, however, the house is packing from 5000

to 6000 boxes every eight-hour shift. That much of a bite is being taken out of a 650,000-box crop, 60% of which is expected to go as fresh fruit and the rest to by-products.

The main building is 180x120 feet and it has a basement, 140x70. There's plenty of room for a third grading-sizing-packing line. It's an airy and pleasant place to work, too under an arched ceiling high as a cathedral dome.—Arizona Farmer.

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ANSWERS—What's Wrong With This Picture?

1. Failure to stop tractor when oiling.
2. Sloppy sleeves around machinery.
3. Unguarded saw.
4. Careless handling of log, endangering thumb.
5. Unbuttoned sleeves near saw.
6. Broken legs and supports on saw table.
7. Man at saw carrying sharp tools in pocket.
8. Double blade axe left unguarded.
9. Axe with broken handle.
10. Sharp pointed hay fork on ground.
11. Boy playing around water tank.
12. Unsanitary mudhole around tank.—leaky water trough.
13. Unsanitary condition of well.
14. Working in front of mower.
15. Horses unprotected from flies.
16. Pick left sticking in ground.
17. Broken handle on pick.
18. Man overlifting.
19. Shovel presents tripping hazard.
20. Boy riding on tractor.
21. Turning sharply at high speed with tractor.
22. Harrowing with tractor rear wheels in narrow position.
23. Tractor driver not watching where he is going.
24. Child riding on harrow.
25. Failure to lead bull with a staff.
26. Broken fence.
27. Trees create blind entrance to highway.
28. Dangling electric wire over driveway.
29. Tree chopper let tree fall wrong way.
30. Tree chopper's axe caught in tree because he is standing incorrectly.
31. Unsafe windmill could fall on someone.
32. Pail resting on platform of windmill may fall off.
33. Stovepipe in window of home.



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34. Upturned rake near house.
35. Smoking in haymow.
36. Door of haymow may fall on someone.
37. Faulty electric wiring near barn.
38. Nails in board on ground.
39. Broken ladder.
40. Broken wheel on ground is tripping hazard.
41. Spraying against the wind.
42. Chimney on house too low.
43. Rickety barn—roof sagging and whole barn in disrepair.
44. Barn stall in disrepair.
45. Ladder leaning against rotten barn roof.
46. Man in haymow too near opening—may fall out.
47. Manure pile poorly placed in front of barn.
48. No safety blocks on saw-tractor wheels.
49. Smooth patch on outside of tractor tire-tread.
50. Pump not braced.
51. No platform around pump.
52. Hose of fruit spray between man's legs liable to trip him.
53. Spraying trees after they have born fruit.
54. No guard rail on windmill.
55. No braces on power plant of windmill.
56. No lightning rods on farm buildings.
57. No guards on wheels of tractor.
58. Seat missing from tractor.
59. Spraying trees after they have born fruit.
60. Doubletree kingpin about to come out of mower.
61. No guards on gears of mower.
62. Reins dropped between horses attached to mower.

From March-April, 1946 Farm Safety Review, National Safety Council.

Citrus Now Fourth in Arizona Produce

IN the past five years citrus fruits have advanced from about tenth place to fourth place as a source of Arizona's agricultural income. Prof. George W. Barr, head of the department of agricultural economics at the University of Arizona, reports.

Dr. Barr suggested that "1946 is a good time" for growers and shippers to think of creating good will on the part of those for whom they produce. "The agricultural producer, through his organizations and his own personal contact with city purchasers, should strive to study the needs of the consumer and adjust production to meet those needs," Dr. Barr said.

Zinc Spray Formula—Caution

In spraying citrus trees with the zinc sulfate formula for mottle leaf control, it is necessary to use either hydrated lime or soda ash with the zinc sulfate. Zinc sulfate alone may cause severe burning of foliage and bark if applied without one of these basic materials. The standard formula is:

5 pounds zinc sulfate, with 2½ pounds of hydrated lime or 2½ pounds soda ash, per 100 gallons of water.

Spray should be applied for outside coverage only, using about 500 gallons per acre for average size trees.—E. C. Moore.

Properly managed and adequately financed cooperatives are the best possible insurance against our Nation's turning either to corporation farming or to farm collectivism.

A Tribute to HARLAN FISKE STONE

Mr. George E. Farrand, general counsel for the Exchange, at a recent meeting of the board of directors made the following comments concerning the death of the late Chief Justice of the United States, the Hon. Harlan Fiske Stone.

IN THE recent death of the Chief Justice of the United States, the Hon. Harlan Fiske Stone, we have all suffered a severe loss. He was outstanding among men in public life in this generation. His guidance will be sorely missed. We have had some outstanding Chief Justices and Chief Justice Stone was second to none.

He was a new Englander, and grew up in that honest, upright, rugged tradition. He worked his way through college. He became a member of an outstanding law firm in New York. He was dean of Columbia Law School. He became Attorney General of the United States. His Amherst friend, Calvin Coolidge, appointed him to the Supreme Court. President Roosevelt elevated him to the post of Chief Justice of the United States. He took a great interest in young men. He was also concerned with the problems of the farmer. He dissented in the celebrated AAA case. His views later were accepted by the Court. He was classified as one of the "Liberal Justices" on the Court. In fact he and the former Chief Justice Hughes, a Hoover appointee, Mr. Justice Brandies, a Wilson appointee, and Mr. Justice Cardozo, a Hoover appointee, were the ones who gave validity to most of the New Deal remedial laws.

This is not an attempt to make a comprehensive resume of the life or activities of this great Chief Justice. I do note at this time my great regret at his death. I had the honor of knowing the Chief Justice and Mrs. Stone for some years. I have been in their home on a number of occasions. They were both great lovers of art and on the walls of their lovely home were many etchings and paintings. Mrs. Stone herself is an able artist. She received callers one afternoon a week. The Chief Justice often appeared at that time to greet their many friends in his courteous and friendly way.

The Chief Justice and Mrs. Stone were fond of young people. They were most hospitable to the young lawyers who came to Washington as secretaries to the Supreme Court Justices or in other capacities. Our son Stephen Farrand, who was in the Department of Justice in 1936 to 1938, and his wife received much of this pleasant hospitality. We all treasure the memory of this kindly friendship. Stephen and his wife spent an hour with the Chief Justice and Mrs. Stone on the Sunday preceding his unexpected death.

The nation has lost a truly great man and a sorely needed one, and we share that loss with all Americans.

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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. Is there such a thing as spraying or treating citrus trees with hormones or something to make fruit set or stick?

A. Numerous experiments have been made with hormone sprays on citrus trees and to date the results have been negative. These materials have been applied during the period of bloom and they have been applied on mature fruit with the idea of preventing premature drop. No result, either good or bad, has been observed in any of these experiments.

Q. My Valencias have a tendency to crystalize. I should be grateful for any explanation you may be able to give me.

A. Crystallization or granulation occurs in practically all citrus fruits if they are left on the tree after maturity has been reached. It is therefore a more or less normal condition. Its occurrence is influenced by climate and it is more likely to occur on vigorous trees than on slow growing trees. Large fruit is affected more than small fruit. No control has been found but losses may be minimized by picking fruit from young, vigorous trees first or by picking large sizes first.

Q. Do you recommend inarching a citrus tree which has been damaged by gophers?

A. If the bark has been destroyed more than half way around the tree, it will be best in the long run to remove the tree and replant. In cases of less severe injury inarching with vigorous root stock seedlings may hasten recovery. In any case where inarchers are used, the regular fertilizer and irrigation program should be supplemented by frequent light application of chemical nitrogen and irrigation water to the soil occupied by the roots of the inarched seedlings.

Q. Will the control of ants in citrus orchards help in the control of aphids?

A. Yes, the control of ants in citrus orchards will help in the control of aphids. Aphid infestations, however, frequently build up too rapidly, especially during favorable winter and cool spring weather, to depend on biological control, and it is then necessary to check the infestation promptly by the use of the proper spray or dust.—A. J. Basinger, Asso. in Experiment Station.

Q. Fumigation at times starts exudation of gum on the trunks of citrus trees, particularly navels. Is this effect cumulative in succeeding years?

A. No! New bark forms under the scales caused by the injury of any single fumigation.—L. J. Klotz, Plant Pathologist.

Q. What are the most favorable conditions under which to spray citrus trees with oil for scale control?

A. The most favorable conditions from the standpoint of the reaction of the tree are sufficiently low temperatures (below 85° F.), sufficient soil moisture, and the proper season. Orange trees are in the best physiological condition for spraying with oil from August 1 to the middle of September, although much spraying is done on through November. Lemons had best be sprayed in October and November, mainly because of the possibility of dropping mature fruit if the spraying is done previous to the month of October. Consequently the spraying of orange trees is begun in all districts before the spraying of lemon trees.—W. Ebeling, Assoc. Entomologist.

Q. With reference to Mr. Moore's article last month, "Grass Roots Views on Non-Cultivation".

(1) If a boom is used there will be a small space between the trees which will not be covered. Just how are these weeds disposed of? (2) Is it advisable to use some organic manure in addition to the commercial fertilizer?

I use two furrows on each side of the trees, but some ranchers use but one. My lemons are on heavy soil (decomposed gneiss), the oranges on

sandy soil. (3) If one furrow on each side of the trees would do as well as two of course it would be cheaper, unless more frequent irrigation is required.

I plant purple Vetch and mustard (volunteer mustard after first sowing) with ammonium sulfate—1 1/3 lbs. in water at each irrigation (plus hog manure some years) and 5 lbs. ammonium sulfate broadcast before discing in cover crop.—Reader.

A. "When a boom is used to spray the area between the tree rows it is also necessary to spray the dry spaces between the trees by hand. Since this space remains dry during the irrigation season weed seed will not germinate readily and one or two sprays in late spring or summer is usually sufficient to control the weeds in this area.

It appears that one can safely eliminate organic manures from his fertilizer program when using the non-cultivation system of soil manage-



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ment. The Hinkley orchard has been under this system for about 25 years. A chemical analysis shows that his soil has as much organic matter as an adjoining orchard that has been growing winter cover crops and receiving 10 ton of manure per acre per year. Some growers have continued to use manure successfully by applying it on the "dry" spaces between the trees so as not to clog the furrows or by using well pulverized manure free of bulky lumps and spreading it in the furrow ways in the fall at the end of the irrigating season. Winter rains and microorganism will decompose the manure to a point where it will not interfere with irrigation the following season. Poultry manure fits well into a non-cultivation system since the nutrients are carried in a relatively small bulk.

I would hesitate to answer your question on the number of furrows to use without first examining your soil and tree root distribution. To answer your question satisfactorily one would first have to dig a trench across a row to determine root distribution.

You should plan to wet as much of the root zone as possible. The chances for success where you use one furrow on each side of the tree

would be greater on the heavy soil than on the sandy soil.

Your fertilizer program looks good to me.—Answered by Paul E. Moore.

Variation in Fertilizer Values of Manure

FERTILIZER values of barnyard manure may vary considerably according to methods of handling and condition of the material as affected by exposure to weather. This is demonstrated in the comparison of two lots of poultry manure (as reported in Volume 20 Monthly Bulletin Agricultural Research), one of which was accumulated during the dry season, the other during rainy season:

Constituents:	Lot A	Lot B
	Accumulated 3 months in Dry Season Per Cent	Accumulated 4 months in Wet Season Per Cent
Water	26.0	53.08
Nitrogen	2.46	0.41
Phosphoric acid	2.14	1.49
Potash	1.12	1.14
Organic matter	29.90	31.70
Ash	43.96	15.72

Much of the nitrogen has been lost from "Lot B". One ton of Lot A would contain about 49 pounds of nitrogen; whereas one ton of Lot B would contain only about eight pounds of nitrogen.—E. C. Moore.



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Increasing Importance of Farmer Cooperatives

Cooperatives must play an increasing part in farm life and farm business if we are to retain the family type farm, Secretary of Agriculture Anderson, told the annual meeting of the National Council of Farmer Cooperatives recently.

Anderson said, "there is little doubt that except for the power of the American farm tradition, the growth of cooperation, and the definite, deep-rooted Federal and State policy of encouraging the family type farm as something of fundamental national strength, the big corporations might have taken over as much of agriculture as they have other parts of our economy."

Business has developed many forms of cooperation and many specific cooperatives which operate exactly like farmer cooperatives, Anderson pointed out, calling specific attention to the Associated Press as a cooperative of newspapers.

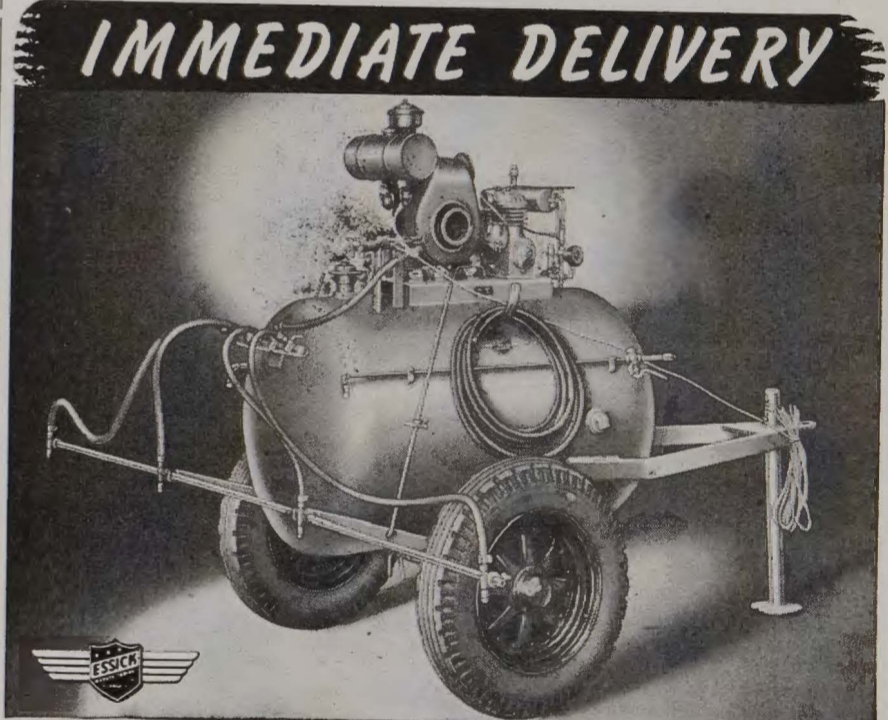
"Cooperatives have fought without letup to eliminate marketing abuses, to break down monopoly, and to implement the public's right to know

what it is buying," the Secretary declared.

"Cooperatives are the very essence of free enterprise in that they actually represent groups of farmers acting together for the purpose of carrying on their individual free enterprises more efficiently for individual profit. Nothing could be more American in its basic spirit and purpose than that," said Anderson.

Coming strongly to the defense of farmer cooperatives in their tax fight against the National Tax Equality Association, Anderson said that the patronage refunds are obviously part of the income of the individual farmer, and as such are subject to taxes as part of his income and are not therefore taxable to the cooperative. "It should be made clear that the farmer in his respect is in exactly the same position as the independent businessman or partner; he pays taxes on his income, including any savings he receives through cooperative action," said Anderson.

Our salvation will come when we realize that peace, as much as war, demands the utmost of the best that we have and for the same reason, that nothing less will do.—James Hilton.



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Fertilization of Citrus Orchards In Florida and California

At the April meeting of the Lemon Men's Club Dr. I. G. McBeth, Manager of the Leffingwell Company, Whittier, discussed Fertilization of Citrus Orchards in Florida and California. During a recent visit to Florida he spent some time studying the improvement in citrus orchards which has been due, in the main, to a fertilization program which makes use of certain of the "minor" elements. Dr. McBeth called attention to the great difference between the citrus soils of California and Florida, and reviewed the work done by Dr. A. F. Camp, Dr. Michael Peech and other investigators of the Florida Station.

Dr. Peech reports the analysis of 55 samples of soils from the Norfolk Soil Series, which is extensively planted to citrus. The pH of the surface soil is shown to vary from 4.6 to 6.59 and the average pH for the 55 samples is given as 6.59. The samples of subsoil from this series is somewhat more acid in character than the surface soil and shows a minimum pH of 4.29, a maximum of 5.89 and an average of 5.03.

The chemical studies by Dr. Peech on Florida citrus soils included samples from nine different soil series. In eight of the nine citrus soils examined all samples tested showed an acid reaction.

The Parkwood Series, from which 15 samples were tested, showed pH readings in the surface soil to vary from 4.83 to 8.31 and an average of 6.52. In the subsoil samples the readings varied from 4.81 to 8.35, with an average of 6.68.

The citrus soils of Florida are very low in calcium, magnesium and other basic materials and with few exceptions show a strong acid reaction, while California citrus soils generally contain very high amounts of calcium, magnesium and other basic materials and are generally alkaline in character. The optimum pH in Florida citrus soils has been fixed at from 5.5 to 6.0. Since the pH of the Florida citrus soils is generally somewhat below the desired point and the basic materials in the soil are very low the adjustment of the pH of the soil to the desired position is comparatively simple. In the great majority of Florida citrus soils all that is required is the application of a small amount of lime or dolomite. Since California citrus soils are generally alkaline in character and contain large quantities of basic materials the reduction of the pH to a reading of 6.0 or below is not an easy problem. Furthermore we do not seem to have, at this time, any definite information as to what the optimum pH is for California citrus soils or what important chemical changes might be brought about by changing them from alkaline to acid soils.

Rather extensive new plantings of oranges have been made in Florida during the past few years but very few new orchards have been planted to grapefruit. Florida citrus growers apparently feel that they can meet competition from other states on oranges more easily than on grapefruit and are therefore confining their new plantings very largely to oranges.

When it was learned that minor elements were needed in Florida soils for the adequate nutrition of citrus trees, the symptoms of deficiencies worked out by California and Florida investigators were widely distributed among Florida growers and in a short time Florida citrus growers were able to recognize leaf patterns indicating a deficiency of magnesium, manganese, zinc, copper and iron.

Standard methods of applying mineral elements were quickly established for both fertilizers and sprays. In order to avoid confusion all recommendations were reduced to a minimum.

Maintenance Sprays: The use of zinc, manganese and copper are generally recommended as nutritional sprays on citrus groves in Florida. For maintenance purposes three pounds of the sulphates are recommended for 100 gallons of spray. For groves on alkaline soils the addition of magnesium sulphate at the rate of three pounds per 100 gallons of spray is also recommended.

Corrective Sprays: When nutritional sprays are used for correction purposes the poundage of the sulphates are increased to four or five pounds per 100 gallons of spray and the neutralizing agent adjusted accordingly.

Fertilizer Program: The fertilizer ratios established by the Florida Station for the fertilization of citrus orchards are as follows:

N	3 or 4	MgO	2 or 3
P ₂ O ₅	6	MnO	1
K ₂ O	8	CuO	½

Whenever possible it is recommended that 40% of the nitrogen be derived from organic materials. Since minor elements have been used in sprays and fertilizers to correct deficiencies in Florida soil the amount of nitrogen required to produce a box of fruit has been greatly reduced. It is now generally recognized that the deficiency in any one essential element results in reduced production and makes the attainment of high efficiency of nitrogen and other fertilizer materials impossible and also reduces the results which can be obtained from those things which have been correctly performed.

During the past few years many citrus orchards in California have declined in vigor and the size and quality of fruit produced has greatly reduced the returns to the grower. During this period the use of oil sprays has been blamed for prac-



FANCY FREIGHT

SOMETHING rather fancy in the way of air freight left southern California recently—six locally grown citrus trees were flown to a garden in the Sahara Desert in Saudi Arabia. TWA carried the shipment, furnished by Armstrong Nurseries and consigned to Sheik Abdullah El Sulamein, Arabian Minister of Finance. The trees included a Washington Navel, Valencia, seedless lemon, Meyer lemon, Marsh grapefruit and Ruby grapefruit. J. M. Story, representing the shipper, delivered the trees to Mary Bullock, chief hostess of TWA's western region, who, no doubt, tucked a blanket around them when they reached 5000 feet.

show that the decline in these orchards is due in a large measure at least to a deficiency in manganese, iron and other essential minor elements.

We do not feel that differences in orchard care in the two sections referred to can be the explanation of the great improvement in trees in one section and a general decline in the other. Grove owners in the district in which orchards have continued on the decline have, we believe, given their groves on the whole as good care as have the owners of groves in the district where there has been a marked improvement in tree conditions and fruit production.

The theory recently advanced that small fruit sizes are due to unfavorable climatic conditions does not seem to fit in with our observations during the past thirty years. Naturally some seasons are more favorable for fruit growth than others but during the years when our trees were in vigorous conditions small sizes were never a problem even during years of rather unfavorable climatic conditions.

Possibly the greatest need of many citrus growers in California at the present time is more information on the deficiencies of essential food elements in California soils. The problem is complicated, much more so than in Florida, and in California there has been little grower demand for research work in this field. The money available for this work has been very inadequate and it has not been possible for the few men engaged in plant nutrition studies to cover the field properly. A much larger staff of investigators and more grower interest are urgently needed.

Pomona to Postpone L.A. County Fair Until 1947

No L.A. County Fair, horse show or race meet will be held in Pomona this year.

Reconversion of grounds and buildings from their wartime role made the choice one of offering an "abbreviated" fair in 1946 or an exposition even bigger than the pre-war shows next year, said President C. B. Afferbaugh.

Plans include facilities for a million visitors, a new palace of agriculture, new departments and broadening of the 20 existing major divisions.

The fair will be held during the latter half of September, 1947.

W. I. Myers, Dean, New York State College of Agriculture, at the opening session of the 1946 National Canners Atlantic City Convention stressed "national policies to stabilize prices and employment at favorable levels, renouncing negative programs like production controls."

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—Samuel Johnson



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Notes on Non-Tillage

By B. E. YARRICK

These observations have been made in the course of a survey of non-tillage orchard management methods and were given as a talk at the Los Angeles County Citrus Institute in March. Mr. Yarrick is a member of the staff of the Agricultural Extension Service of Los Angeles County.

THE introduction of non-tillage in citrus orchards probably represents the most fundamental change in soil management that has come about in the history of citrus culture. It was not many years ago that plowing, discing, and harrowing were resorted to following each irrigation to establish a dust mulch on the surface, the theory being that this would prevent the loss of water. Since this has proved to be a fallacy, growers are now cultivating primarily to destroy weed competition and facilitate irrigation in the orchard.

Now, however, some 20,000 acres of citrus groves in the state no longer practice any tillage at all. The weeds are controlled by various methods using oil, fire, chemicals, and hand hoeing.

The desirable features of non-tilled soil have been known for many years. The significant point is that just recently we have found a practical method of destroying weeds. Without exception, the growers practicing non-tillage I have interviewed have been very enthusiastic. They are well pleased with the results. I have asked opinions of many growers who are still cultivating and I have received a variety of answers. Most

of them are just cautiously waiting to be sure. Some object to oil in the orchard. Some believe in the necessity of cover-cropping and adding organic matter to the soil. One grower was not ready to add more pipelines at this time.

All growers whom I have contacted concur with reports from other counties that growth responses and fruit quality are perfectly satisfactory. It is generally accepted that fruit in non-tilled orchards matures from one to three weeks earlier, probably due to higher soil and air temperatures. One packing house manager has reported poorer keeping quality in oranges after picking. This is being studied. We are following all such leads having to do with fruit quality.

An increase in total crop can easily be seen in many orchards where the grower allows a maximum of skirt development. Large volumes of fruit can be seen close to the ground, a bearing area not possible when tillage tool clearance is necessary.

Just about every conceivable type of mechanism has been devised to apply oil sprays. Some of the growers have been very ingenious and are justly proud of the small portable units they have built for this work. The cheapest weed control has been obtained on the small orchards where all the work is done by the grower with a knapsack sprayer. Excellent results have been obtained by using a tank, a small pump, a boom sprayer, and a hand hose all mounted on the back of an old junk car.

In general, with efficient management a grower can expect his weed



YIELD IMPROVED

This orchard, one of the blocks of the Murphy Ranch, located near Whittier, is in rather shallow hilltop soil. Discontinuance of cultivation and use of oil to control weeds has increased water penetration and extended the area of soil available to feeder roots. Crop production has increased substantially because of improved tree health and greater bearing area. Note that with no cultivation the "skirts" of the trees, which bear a sizable yield of fruit, extend to the soil surface.

control to cost somewhat more than tractor tillage for the first two years, then a gradual decrease in cost to practically nothing, depending upon the situation. Some of the huge costs submitted in cost studies were obtained from trying to reduce dense mats of devil grass and morning glory by using oil alone, often using as much as 700 to 800 gallons of oil per acre per year.

As an average, growers are using around 240 gallons the first year and decreasing to 90 gallons in the fourth year. Many on small orchards use much less oil than this and start hand hoeing in the third year, which represents an ideal situation.

It is best to start the chemical control of weeds in the early summer after the winter cover is completely gone and permanent furrows are established. The least oil will be required if the weeds are hit when less than four inches in height. If consistently done before seeding, all the viable seeds will soon germinate and oil need not be used for occasional weeds.

I have seen orchards in systems varying from two furrows to seven furrows per panel. The latter has two under-tree furrows barely clearing the trunks, and thus with alternation the entire soil area is wetted. Most orchards are using three or four broad-basin furrows. Incidentally, when planning to dispense with tillage practices it is well to consider which areas will bear the traffic of trucks and pest control equipment.

The presence of oil on orchard soil does look bad and some fear its effects. A correct application need not drench the soil, since a light mist will kill the weeds. Smudge oil is generally used. It is very volatile and leaves only a stain. Chemical tests have not been able to show the presence of oil in the soil and no growers have complained of any ill effects.

Several have stated that spraying this oil has ruined their boots. The best type of boot to buy for this work is made of an oil tanned leather with either oiled or neo-prene soles. People that work in oil consistently use an entire neo-prene boot or special neo-prene soled shoes.

Non-tillage has presented no apparent problem to the fertilizer program. The proponents of manures are well satisfied with the results obtained by allowing the materials to decompose on the surface. The various chemical fertilizers lend themselves well to this method.

In view of the thousands of acres that are doing excellently using only chemicals for many years, the necessity for annual applications of organic matter is in question if the soil is not tilled. The Hinkley (Redlands) orchard has not had organic matter or cover crops for over twenty years, yet the organic matter content of the soil is as high as in the adjacent property that has been heavily cover cropped the entire period.

If, in a non-tilled orchard, erosion is no problem and additional organic

matter is of no value, the effort and expense of a cover crop have little justification.

If formerly cover cropped, a non-tilled orchard should require less irrigation water. The greater permeability that is being obtained, however, creates certain irrigation problems since the desired penetration is obtained in much shorter time. This will require that larger heads be used in fewer furrows to get the water through faster. If this is not

practical, another pipeline may have to be added to shorten the run, as many growers have had to do.

The desirability of obtaining good irrigation coverage should be emphasized because the increasing use of ammonia in irrigation water will require good irrigation efficiency. If it is taking too long to get the water to the ends of the furrow, excessive leaching will result on the light open soils. On the heavy soils or those

with a restricted drainage, the subbing of water may actually increase the gummosis problem in an orchard or adversely affect other root conditions.

The change to the non-tillage system has created no erosion problems. The handling of flood water from adjacent properties, however, does present more of a problem because deposits of new soil contain weed seeds. It is desirable that every plot

(Continued on Next Page)

It's not one bit too early to plan for FUMIGATION



KNOW the probable later extent of scale attack in YOUR grove, if not stopped. Check it NOW.

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MANUFACTURERS OF HYDROCYANIC ACID GAS AND EQUIPMENT FOR ITS APPLICATION

Non-Tillage

(Continued from Page 319)

should be completely isolated by ditches or tile from run-off from neighbor's orchards or hillsides.

Due to the generally high quality and low sodium content of irrigating water of orchards studied, we can foresee no future problem in penetration troubles. Lack of penetration might possibly develop under certain chemical fertilizer programs.

A fundamental point involved is the effect of non-tillage on the soil structure. We have two well-established and generally accepted facts—one, the high value of a virgin soil; and two, poorer quality of a replanted orchard on that same soil 15 to 25 years later. What is the difference? Surely not the depletion caused by extraction of moderate amounts of nutrients, especially when the fertilizer program may have added several times that which was ever

extracted by the trees. The difference in these soils apparently has been produced by cultivation and compaction. This has caused an absence of roots in the top soil of many of the older orchards in the panels where cultivation has been excessive. Elimination of this very undesirable factor is being accomplished by non-tillage through the elimination of heavy equipment from orchard management. For desirable root growth it is necessary to have in the soil oxygen and ventilation, water, and a desirable temperature range. These factors are definitely being improved under the non-tillage system.

Probably the greatest advantage lies simply in orchard convenience. The furrows are ready for water at any time without notice. It is easier to walk over the soil and handle equipment. Operations can be carried out sooner after a rain. Orchard heater care, picking, disease and pest

control—are all much easier on solid ground without a tall wet cover crop. Where clean culture has improved air drainage, growers are reporting as much as two degrees warmer temperature during the firing weather.

Rise of the Grapefruit Family

GRAPEFRUIT is said to be a mutation or chance hybridization between the orange and the shaddock. The latter, believed to have first come to light in the Malay Islands, belongs to the orange and lemon families but, like many a human being, lacks merit until united with a better mate. Its trees are tall and its flowers are large and white, developing into large fruits that look like oranges, but are paler in color and have a pungent taste that is not agreeable. However, the story goes that Captain Shaddock,

the master of an old-time sailing ship, ran out of lime juice, needed to prevent his crew from coming down with scurvy on a voyage in the South Seas, and happened to find this strange fruit, which served his purpose well enough.

He brought some seeds to the West Indies, where plantings flourished and unions with orange stock somehow came about, thus originating the grapefruit family. It was given this name by John Lunan in 1814 in a description of the horticulture of Jamaica. The family proved a great improvement on the shaddocks in appeal to the human palate, but for a long time even after it was introduced in Florida in 1809 by Don Phillipe, a Spanish nobleman living near Tampa Bay, the grapefruit, then called the polemo, was grown chiefly as a curiosity.

But prosperous northern people began to visit Florida in the winter for the climate. Their number steadily grew, and their first acquaintance with grapefruit gave them a desire for more. They liked its taste when fully ripe, and felt its beneficial effects on digestion. They told friends in the North about their discovery of a new fruit of notable merit, and along in the fourth quarter of the last century first shipments were made—in barrels, netting the growers some fifty cents a barrel. At the beginning of the present century, however, all the fashionable and expensive hotels of Florida were serving grapefruit on the breakfast tables, and at last it was off to a flying start.

All of it was rather heavily seeded at first, and much in Florida still is, but a younger member of the family appeared with a new appeal—an absence of cluttering seeds. This, of course, is Marsh Seedless. Research has shown that the parent tree was a seedling in a grove near Lakeland which was bought by William Hancock in 1862. It was killed in the 1894-95 freeze, but in the meantime, after grapefruit had begun to attract wide attention, propagation had been started and trees here and there were producing seedless fruit of excellent quality. Even so, its special desirability was not generally recognized for some thirty years.

The Lower Rio Grande Valley, swinging strongly into citrus production and marketing immediately after the First World War, made Marsh Seedless its banner fruit, and now any other variety of grapefruit is rarely planted. The mutation called Marsh "redblush," which began to appear in this area in considerable quantities about fifteen years ago, has stepped out to the front like a feminine band leader, with the result that we see our grapefruit in the lead in quantity and quality, and the world's most colorful citrus.—From Texas Farming and Citriculture, January, 1946.

The immortal Thomas Jefferson, himself a tiller of the soil, said: "Let the farmer forevermore be honored in his calling; for they who labor in the earth are the chosen people of God."



"This thing," Boss he say to me while I listen by saying nothing, "is a soil tube. It is an instrument by which you look two-three feet under the soil top and see if the soil needs irrigation or if water has gone down far enough. You can do the same thing with a shovel, but a soil tube (or auger) makes it easier. Lots of people are beginning to find out that irrigating an orchard is one of the most exacting jobs in citrus growing. Others have known it for a long time, and their orchards show it. Just enough water, not too much. Save water, save trees, save money."

Good Frozen Foods

TAKE it from Roy Hagen, one of the leaders in the southern California frozen foods field, a good market in a rather wide variety of farm products is waiting for the producer of top quality goods. Among these potential frozen food items, the Boysenberry ranks top billing in southern California.

Hagen spoke recently on his subject before members of the agricultural committee of the Los Angeles Chamber of Commerce. Consumption of frozen foods, he remarked, has risen rapidly over the past five years, with something like a 25% increase over the preceding year chalked up at the close of each twelve-month period. Even so, the total frozen food tonnage produced last year in the USA would feed the entire nation for only about four days. So the field is still largely untapped.

Hagen said that Southland produced peas have proved unfit for freezing despite the fact that this vegetable holds first place in the list of vegetables successfully frozen. Some 30 varieties of peas have been tried for the purpose between Santa Barbara and San Diego without success. Lima beans, both baby limas and Fordhooks from the same sections, are suitable for freezing and the market is growing each year.

Southland spinach also has been proved excellent for freezing and so has corn, cauliflower and broccoli from the southern counties.

In the field of frozen fruits and berries, strawberries take first place nationally, but production is extremely limited in southern California. Northern berries and northern production along the entire Pacific coast have also been successfully used for freezing and the market is wide.

In Hagen's judgment, the Boysenberry produced by southern California growers in rather limited quantity has a very excellent future for this purpose and the field is almost unlimited. He urged more plantings of this berry for freezing. Cling peaches,

he said, tried out last year, probably should not have been frozen. Such freestones as Hales and Elbertas, do very well as a frozen commodity. Rhubarb also is frozen with some success.

Hagen said that frozen cooked items are still in the experimental state. Under proper refrigeration all successfully frozen commodities can be transported half way around the world. One limiting factor is retail distribution, but this field is being

rather rapidly widened. He said some 30-odd vegetables have been successfully frozen and marketed.

During his address, the speaker strongly stressed quality in the fruit or vegetable sold for the freezing process. Frozen foods, he said, compete with fresh foods, not with the canned product. Hence prices will tend to remain comparatively high, both in returns to growers and in retail pricing.

The reason, he explains, lies in the

fact that freezing actually tends to accentuate any blemish or defect shown by the fruit or vegetable. Such defects, harmless in anything but appearance, are removed in the canning process, but render the frozen product wholly or partially unfit for sale. Hence producers of fruits or vegetables for freezing must bring to market a top quality item for which they may expect to receive top prices.—Clyde Simmons in Pacific Rural Press.

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- Kryocide, the pioneer cryolite insecticide, is safe and effective. Has been used for years in Southern California with outstanding results.

Your Experiment Station, inspector or insecticide fieldman will give you detailed Kryocide recommendations. When ordering from your dealer, insist on Kryocide. Remember: Kryocide gives you all the many fine advantages of natural cryolite.



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Chemicals
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With citrus groves worth more per acre today than ever before, of course I won't take any chances on unknown or cheap pest control! One of the reasons my grove has been so productive is that I've always used Leffingwell products. Even back when I was just starting in as a grower I made it a habit to look for the best... and I found it in Leffingwell. Now that my good judgment is paying off wouldn't I be a fool to take a chance on anything but Leffingwell protection!

In 47 years Leffingwell has solved many pest control problems. Their wide experience, combined with never-ending research and development, strict manufacturing control,

thorough field tests, and rigid adherence to high standards of quality, has resulted in products of uniform excellence and dependability—products known and used by successful growers everywhere.

Consult the Leffingwell representative in your district today if you, too, want the best in proven pest control to protect your grove!



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DOW

COOPERATION'S TRUE AIM

By OSCAR W. COOLEY

This article was written in reply to "What is a Cooperative?" by Ottar Tirglum of the Wisconsin Association of Cooperatives, and is from the April, 1946, issue of the Cooperative Digest. Mr. Cooley is associated with the Indiana Farm Bureau Cooperative Association, Indianapolis.

AS one who is concerned with cooperative publicity, I am not very happy about Ottar Tirglum's definition of a cooperative—especially with his implication that the ultimate objectives of cooperation and of socialism are the same. He sees both cooperation and socialism as "production for use." Thus their goals are the same, he reasons, although their methods are admittedly different.

But their goals are *not* the same. The difference is vital, especially in these times. Socialism aims at the establishment of an order in which all economic activity is planned and controlled by a single, central authority, either the state or some similar agency. In short, it aims at monopoly; benevolent monopoly, perhaps, but monopoly nevertheless.

"Competition for Excellence"

Cooperation has no such aim. Indeed, monopoly of any kind is the very opposite of what cooperatives are seeking. Cooperatives are established to do a job and to do it better than any other form of enterprise can. That implies a contest—"competition for excellence," Dr. J. P. Warbasse calls it—between cooperative and non-cooperative business. Socialists don't believe in that kind of contest; they feel that they know how our economy should be organized and that no further experimentation is necessary.

Freedom is the very essence of cooperation. Cooperatives can be established only in a society where people are free to choose what kind of business organization they want to pro-

duce and distribute their goods. Totalitarianism of any kind, whether established by bullets or by ballots, snuffs out cooperation because it snuffs out the freedom of choice. This has been well demonstrated under all the totalitarian regimes.

Democratic socialists are infatuated with "majority rule"; they would have the majority rule our economic as well as our political affairs. Today in America the great majority are voting, through their patronage, for non-cooperative business. If this vote of the majority were enforced upon the country, all cooperatives would be ruled out of the picture.

Rule Balanced

Fortunately, the U. S. Constitution sets up a system in which majority rule is balanced against individual freedom. Political matters are decided by majority vote, but the individual, whether he be of the majority or of the minority, is guaranteed the freedom to express himself, to assemble with his fellows and form voluntary organizations, to own property and so on. Without these freedoms, guaranteed in the Bill of Rights, America never would have had a cooperative movement. Cooperation is truly a child of the Bill of Rights.

Under socialism the Bill of Rights surely would wither away, for a centrally planned and controlled economy could not permit people to step outside the plan and set up businesses which would compete with it.

Flight of Imagination

By a long flight of the imagination, one can conceive of a time when everybody will turn voluntarily and freely to the cooperative way of business because they prefer it. Even if such a state of 100 per cent cooperation came to pass, the freedom to set up and to patronize non-cooperative business would still have to remain, unless cooperation were to give up its philosophy of voluntarism, in which

case it would no longer be cooperation but socialism.

According to Mr. Tirglum, cooperation as well as socialism believes in "production for use." The phrase "production for use, not for profit" means less than socialists would have us believe. A business man producing patent medicine must make a medicine that consumers will want to use, otherwise he will not be able to sell it and make a profit. According to the socialists, he will make the poorest medicine he can get away with and still sell.

But I have seen—as Mr. Tirglum probably has also—patent medicine on the shelves of cooperative stores, too. Was the co-op producing these nostrums "for use?" In the last analysis cooperatives, like profit business, must furnish the kind of goods and services that their patrons want and demand, at the same time educating patrons to higher standards. In a socialist economy, we would all take the kind of medicine that the chief of state decreed we should have—and like it.

When cooperatives depend for their very life on the maintenance of freedom of enterprise, it is somewhat depressing to see cooperative spokesmen ignoring freedom and even beating the drum for governmental measures which, to an ever increasing extent, put the hobbles on freedom and lead us toward the very kind of tyranny that we have just fought a bloody war to put down.

Nation's Debt Reaches \$2000 Per Capita Total

WITH a national debt before them of about 280 billion dollars (almost \$2,000 per person) "our legislators and executives should be studying economy and fewer rather than more costly federal enterprises and activities," said Simeon E. Leland, Chicago University Professor Government and Finance, and Chairman, Chicago Federal Reserve Bank, in a recent Pittsburgh speech.

"A national debt of 280 billion dollars paid off in thirty years would require annual payment of \$11,162,000,000 including interest; paid off in 100 years, the annual payment would require \$5,801,000,000."

Back in 1932 President Roosevelt "viewed with alarm" a national debt of 5 billions of dollars. Little wonder then, observes the new NAM booklet, "Your Dollars," that the present debt is incomprehensible to the average citizen and represents a terrifying burden.

Although Washington "planners" say that this money is merely owed by Americans to each other and the size of the debt doesn't matter, the booklet continues, hard-headed realists declare that the debt leads to inflation and constitutes an honest burden to all citizens—a burden which must be paid off to the last dollar in 50 to 100 years.



• Because citrus groves are planted on hills as well as on level ground, the tractor that powers tillage operations in these groves has to have plenty of "pull" wherever it goes. International Diesel Crawlers have that pulling power—plenty of it—delivered to the drawbar.

International Crawlers are *better balanced*. Their weight is properly distributed so that on the hills or on the level, they grip the ground like they were geared to it. And their rated horsepower is the amount of power actually *delivered to the drawbar*. That's why owner after owner has been able to say, "My International Crawler has much more power than competitive tractors of comparable rating." Internationals produce



that power with very low fuel consumption. Precision-built, *instant-starting, full-Diesel* engines, engineered for real operating economy, make that possible.

Visit your International Harvester dealer and get the facts and figures about International performance. These facts will prove better than anything else that International Diesel Crawlers are "Power Packages" with plenty of pull—the kind of power you need for efficient tillage work in your citrus groves.



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BRANCHES AT: LOS ANGELES

SAN FRANCISCO

Lotsa Pests Intercepted

IN March, California agricultural inspectors found in the baggage and belongings of travelers entering the State at border highway stations, 4823 lots of plant material in violation of federal or state plant quarantines designed to protect California agriculture against losses from insect pests or plant diseases not presently established in this State.

From the intercepted plant material, 9424 insect pest specimens were taken and submitted to the State Department of Agriculture at Sacramento for identification.

Among the more important interceptions made in the course of the department's agricultural protective work in March were 1394 lots of prohibited plant material capable of introducing serious citrus pests.

Consideration of the conditions under which some of these prohibited plant products were found emphasizes the importance to agriculture of inspecting vehicles entering the State. Oranges and grapefruit were found inside a sewing machine, oranges in a housetrailer flour bin, seed cotton used as packing around egg cases in the back of a touring car, cotton seed used as packing around canned fruit in a private automobile, apples among clothes in a housetrailer cabinet, rooted plants in soil in a suitcase, cotton bolls in a tea box under clothes in a suitcase, growing plants under household goods in a garbage can, corn on the cob in a washing machine, and so on.

"They conquer who believe they can. He has not learned the lesson of life who does not each day surmount a fear." —Emerson

CITRUS SHIPMENTS

Season Carlot Shipments from November 1 to Week Ending May 14

Weeks Ending	Week's Shipments		Total	
	Calif.-Ariz.	F.O.B. Pk.-Bx.	Calif.-Ariz. From Nov. 1	Total U.S. From Nov. 1
ORANGES				
5-11-46	635	4.65	42,598	121,169
5-12-45	1,177	4.34	46,097	126,151
5-13-44	592	4.36	45,278	132,444
GRAPEFRUIT				
5-11-46	42	2.08	4,513	51,245
5-12-45	91	3.47	4,921	44,732
5-13-44	58	2.79	4,963	46,283
LEMONS				
5-11-46	337	4.03	10,359	10,359
5-12-45	396	5.43	10,954	10,954
5-13-44	346	5.46	10,152	10,152

GOPHER GOSSIP

HERE are a few paragraphs, lifted from a friend's correspondence, which bear upon a perennial problem and also illustrate the mental and physical doings of a man lately gone rural:

Dear . . . I want to tell you about what I have been doing in the grove, what my plans are and also some of my problems. My first undertaking has been gopher control and I still don't know who has the upper hand.

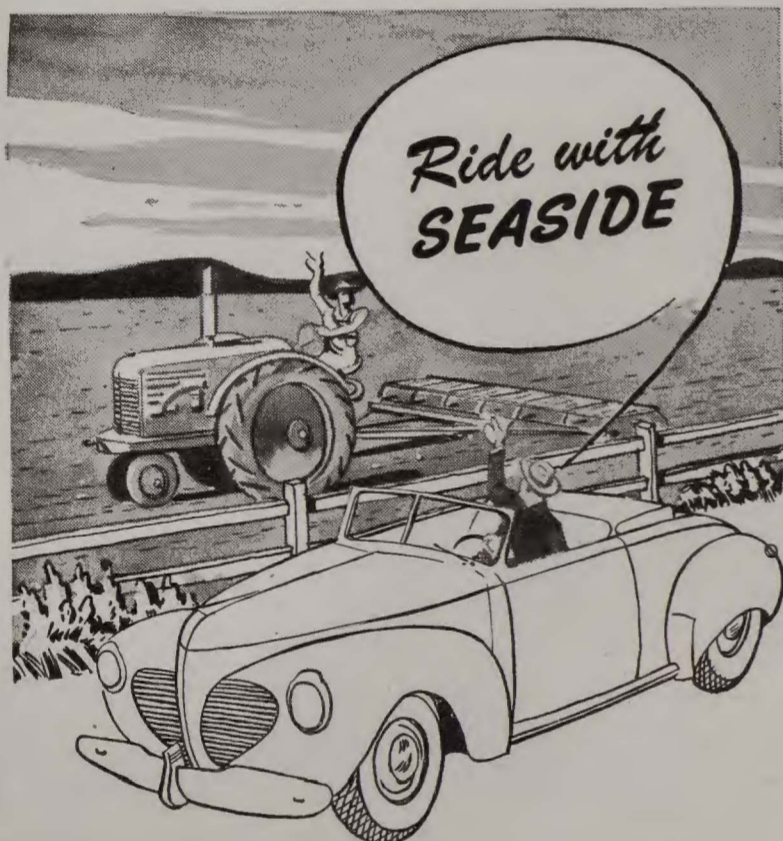
For the first few days I would start out the first thing in the morning with my shovel, trowel and bottle of pink pellets for pale gophers. About five hours later, I would drag myself up the hill having covered the grove row by row. I am sure that I am making some progress, certainly mileage.

Lately my schedule has included a half day every other day devoted to this purpose and it will continue this way until I know definitely that I have achieved victory over the little b—s. The balance of my time con-

sists in digging around each tree so as to expose the crown roots.

This was according to your suggestion and I must say that I think it is the best possible way to spend my time, for the following reasons: 1. In removing the weeds so that the ground around the tree is exposed is invaluable in my gopher control program. I can take a quick look at the tree and know that the tree is or is not currently subject to gopher action. 2. I find when digging whether Mr. Gopher has taken up residence under the tree and if he has I then take appropriate steps. 3. I learn about trees. 4. I so agitate the gopher that he looks for a new home and in doing so he makes fresh mounds of dirt and bang I nail him. 5. I am able to more or less determine the extent of injury and thereby guide myself accordingly as to what action to take with the tree. 6. I expose the bud union to the air. . . . Come and see us. You can't miss the grove of gophered lemon trees!

Sincerely,



On the highway and off the highway throughout the West, Seaside Petroleum Products are giving dependable performance. Whether you buy Seaside gasolines, motor oils, diesel fuel or greases, you are getting highest quality petroleum products correctly engineered for specific operating needs. Seaside dealers and agents are located in principal cities and communities . . . Start today to "Ride With Seaside."



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NOTES ON WATER USE WITH NON-TILLAGE

PRACTICALLY every citrus grower who has adopted the non-tillage system of culture has reported that the soil takes water more rapidly. Since water penetration has been a problem on many soils that have been injured by over-tillage and compaction, this increased rate of absorption has been a welcomed change.

To suddenly allow a soil to have more water may have disastrous effects in some orchards. Actually, if formerly the soil had been cover cropped, less water should be required. Thus, with greater absorption of rain water through the winter season and lack of extraction by vigorous weeds, non-tilled orchard soils should be carefully studied prior to the first spring application of irrigation water.

In the soil types which possess tight subsoils and do not allow deep percolation of free moisture, rain and irrigation water may accumulate and result in killing of deep roots and gumming in the trunks. In such a case, the first irrigation should be extremely light or delayed.

The structure of a soil undergoes a definite change early in the transition to non-tillage, a change which is definitely an improvement. The important factor is that with this change the soil management must also be altered accordingly. Failure to observe this and to follow the fundamentals of irrigation may cause trouble in the root zone. In any event, the timing of irrigations may well be determined by use of a soil tube or auger and close observation.

Soils dry most rapidly in areas where living roots exist. If the top foot of soil is becoming dry and too much free water is still in the subsoil, it would be well to attempt to moisten only the dry soil with a flash irrigation, using larger heads of water for shorter periods. Some growers have cut the time of running water to a fraction of the former practice.

Another factor to watch is the lateral movement of water from furrows, or "subbing". In no case should water be allowed to run long enough to allow subbing to reach the tree trunks. This will most certainly cause gummosis.

In contrast, the soils which allow ready percolation of all excess or free moisture will not suffer from root damage and gummosis. Here, excess water causes loss of nutrients through leaching. With the increasing use of nutrients in the irrigation water, good irrigation practice gains an added premium.—Burnell E. Yarick.

Orange juice re-constituted from the 7-to-1 concentrate made by Florida Citrus Cannery Cooperative is being introduced in Spartansburg and Atlanta by Foremost Dairies delivery, which expects to develop in southern cities a market for 1,500,000 gallons, the equivalent of three million boxes of fresh fruit.



... Says Ernest S. Milton, Fillmore, California

Here is Ernest S. Milton in his grove near Fillmore. He owns the first Diesel D2 to go into the Sespe District.

THE FIRST "Caterpillar" Diesel D2 Tractor to go into the Sespe District was purchased by Ernest S. Milton, Fillmore, California. That was 8 years ago. Today, Mr. Milton has that feeling of solid satisfaction that comes from having your judgment emphatically confirmed on an important deal.

"In all of its use," reports Mr. Milton, "I've never stripped a gear, replaced a clutch nor heard a cylinder misfire. Nor has the D2's engine ever boiled."

"My D2 has had some really hard jobs to do. Besides cutting heavy cover crops (with 6'10"

cover crop disk) I've used it to yank out many undesirable trees by direct pulls.

"The D2 has been our only answer to the problem of getting a heavily-loaded truck of fruit out of a sandy field. While pulling the heavy 6'10" disk, my D2 has never consumed over one gallon of fuel per hour."

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Here is the Milton D2 pulling the 6'10" cover crop disk weeding his grove. The D2 burns only one gallon of fuel per hour here!



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More News Notes

David E. Pritchett, of Ontario, a member of the research staff at the California Fruit Growers Exchange laboratory, read a paper, "Purification of Hesperidin" before the convention of the American Chemical Society recently at Atlantic City. Hesperidin, an orange product, is the substance from which vitamin P is obtained. Harold E. Merchant of Chaffey College worked with Pritchett on the paper.

Pfc. Raymond Guidotti, of Indio, recently sent home a label from a grapefruit box in Korea bearing a Coachella Valley stamp.

Property located in Oxnard was purchased recently by the Somis Lemon Association as a site for their new packing plant.

Wayne Huffman sold his 17-acre grove in Fullerton to Mr. and Mrs. I. C. Stearns.

Mr. and Mrs. William Oldenberg recently purchased the 21-acre orange ranch in Villa Park from Mr. and Mrs. Louis H. Hoskins.

A 27-acre Valencia orange grove near Downey has been purchased by Mr. and Mrs. Flannery.

John Cozad of Tustin bought five acres of oranges from Lester Keever of Santa Ana.

Located just north of the present plant of Brined Fruits on North Pomona Avenue, Brea, construction is progressing rapidly on the \$100,000 plant of the Hart's Fruit Products Company of California.

Dale Gentry, owner of the California Hotel in San Bernardino, purchased a 40-acre citrus orchard in Greenspot from George E. Fulbright.

Lt. John Wilkin, of Indio, head of an Army commissary in Manila, had cause for homesickness when he recently checked in Coachella Valley grapefruit. He reported that the fruit arrived in excellent condition.

The San Dimas Lemon Association has recently had a new air washer and refrigeration unit installed. The unit gives additional protection and is so arranged that the old or new unit can be used separately or together.

Quick-frozen milk is here. The Army, which pioneered it, ships thousands of pints monthly to troops in all parts of the world. It keeps fresh as long as three months and offers people in isolated areas a dependable supply. Aim of a current study is quick-freeze storage for periodic surpluses with increased price stabilization for the entire dairy industry.

Thirty thousand dollars for construction of an experimental citrus processing plant at the Lake Alfred station was approved last month by the state cabinet, for the purpose of testing methods now in use and pioneering new developments.

New plantings in Texas have exhausted stocks in nurseries, according to Inspector E. W. Halstead of Mission.

Checks totalling nearly \$4,000,000 went into the mails recently as the California Almond Growers Exchange, grower-owned marketing association, closed its books with a "final payment" on the record-breaking 1945 crop. According to D. R. Bailey, Exchange general manager, with this all-time record payment the total payments for the 1945 season now amount to nearly \$10,000,000.

"To say that farmers are disgusted with the strike business is putting it mildly. They know that there is no wealth except in production, and they realize that the country needs wealth today as never before to meet its accumulated obligations."—Chicago Daily Drivers Journal.

"Every government degenerates when trusted to the rulers of the people alone. The people themselves are the only safe depositories."—Jefferson.

Progress in Tree Horticulture

(Continued from Page 290)

ready there as a result of respiration. If he is measuring the total dry weight of the plant in proportion to the leaf surface it has borne, he knows this is considerably less than the total amount of substance formed in those leaves, for the cells in all parts of the plant will have been breaking down sugar all the time, day and night, when it was warm enough. He can make a rough estimate of the amount of substance by measuring the amount of carbon dioxide given off or oxygen absorbed during dark periods, when there is no photosynthesis.

Since growth and yield are dependent on this process of photosynthesis, the horticulturist would like to know how conditions and practices in the orchard affect it. The rate is dependent on the supply of carbon dioxide in the air, on light, and on the efficiency of the chloroplasts. The amount of carbon dioxide in the air is low, about three parts in 10,000. An acre of full-bearing trees will probably use in a year about as much carbon dioxide as would be contained at one time by 300 acres of air 30 feet deep, but the amount of carbon dioxide is nearly constant at a given elevation, being replenished by respiration of organism in the air and in the soil and by animals on the land and in the water. When all other conditions are favorable, increasing the amount of carbon dioxide in the air tends to increase the rate of photosynthesis.

Light and Growth

When single leaves are studied the light intensity adequate for maximum photosynthesis is considerably less than full sunlight. However, on a rather large apple tree put under control by Dr. Heinicke at Cornell University, photosynthesis was more rapid the more intense the sunlight, at Ithaca, New York, where summers are cloudy. This was probably because many leaves deep in the head of the tree have only barely enough light to keep them alive, and the brighter the sunlight the more light these shaded leaves receive; and the more chlorophyll they will have; light is necessary to maintain the chlorophyll as well as for the energy of photosynthesis. In California also photosynthesis on a whole tree will probably tend to be more rapid the more intense the light, for many more leaves remain alive deep in the shady part of the tree in California than at Ithaca. In other words, an acre can produce more in California than in some other sections partly because it receives more light.

The soil may influence the rate of photosynthesis, magnesium for example is a part of the chlorophyll substance and iron in the chloroplast is necessary in some way for formation of chlorophyll. When iron is deficient however, the leaves tend to be golden yellow. Florida has corrected a magnesium deficiency in her

citrus orchards and will probably give you more difficult competition in the future.

Accumulation of sugar and starch in the leaves reduces the photosynthesis and seems to shorten their lives; for example, trees from which the flowers are removed will have a paler green color and lose their leaves earlier than trees that are bearing a heavy crop to use the excess of food. Although the crop on a tree

may be using as much food as the wood-growth or leaf growth, such a heavy crop tends to dwarf the tree surprisingly little. Ten pounds of material other than water in the fruit may reduce the trees growth in proportion to leaf surface by only about three pounds. This is probably in part because the fruit hastens the removal of sugar from the leaves so that it does not impede photosynthesis so much.

Leaf Surface

Pruning is a removal of leaf surface, as buds from which leafy shoots would grow, and reduces the total growth on the tree in fruit or wood or both. Since very many leaves are normally killed off by shade, one might think that pruning to let in light could be done in a way that would keep about as much leaf surface from being shaded off as is re-

(Continued on Next Page)

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Progress in Tree Horticulture

(Continued from Page 327)

moved by the prunings. In all the experiments that have been reported, however, pruning has caused a considerable reduction in growth and yield. I am not convinced that any of these experiments have been done in a way to cause the minimum net reduction in leaf surface.

For example, if a tree is permitted to become much too large for economical management and many of the lower branches are greatly weakened by shade and then large branches in the top that contain the best lighted, healthiest leaves are cut off, the reduction in growth and yield should be much greater than if, to keep leaves of lower branches from being shaded off, pruning had begun as soon as the tree had become slightly too tall, and only a few branchlets had been cut out at the top each year, enough to keep the tree from increasing in height. But I don't know.

Usually sugar does not accumulate to high concentration in any part of the plant except ripening fruit but is changed to starch grains in the leucoplasts, colorless plastids. Soluble substances such as organic acids are formed from sugars by partial oxidation, and these may combine with other substances such as nitrogen compounds. When sugar and these other related compounds move from the leaves to the roots and other parts of the tree, that movement is through special long cells in the bark. Sugar may be changed to starch in the leaves during the day and this back to sugar and move out of the leaves during the night; whenever starch is to be moved in the plant it is of course first changed to sugar.

If a ring of bark is removed, sugar and other organic compounds remain above the ring, because conducting cells have been cut, the sugar being changed to starch in the plastids. Starch is usually the most abundant food substance; and the amount of it is considered a good measure of the excess of organic food products, but many other organic compounds also may accumulate above where a ring of bark has been removed.

There is evidence that something from the leaves may control also special qualities of fruit. Dr. Heinicke topworked some McIntosh apple trees rather high so that there was some fruiting wood left below the union. He found some McIntosh fruits set where, by removing a few leaves from around them, they would be fed by leaves of some other variety. When McIntosh fruits were fed by Baldwin leaves, they were more like Baldwin than McIntosh. In that climate Baldwin apples have, very badly, what is known as "bitter-pit," a network of brown, dead spots under the skin. McIntosh fruits on all McIntosh trees do not have it but McIntosh fruits fed by Baldwin leaves do.

Leaf—A Factory

The leaf is the most important factory in the world. The sugar it produces makes plant life and animal life possible, but it produces also many important by-products that control processes in the tree.

I hope that by describing some of the fields of research that have given helpful suggestions to the horticulturist in recent years, I have given better evidence concerning the nature of his work. He can not help you much by studying your experience. You can do that, I think, better than he. He is not apt to learn much by trying things that hundreds of you have tried. He can, I think, be most helpful by doing his part toward the development of an orderly system of knowledge about the processes of trees and fruits that is as near as possible to being complete. To do this he must examine for suggestions everything that others learn about plants and about the chemistry of living things. He must read the same research reports in plant physiology and biochemistry that plant physiologists read and what his fellow horticulturists report besides, and he must visit orchards for suggestions and to study his findings in practice.

For these reasons and because the tree is so cumbersome to work with and so slow in development, no one horticulturist will make many important discoveries. He is fortunate if his work, fitted in with that of others somewhere in the world, is helpful in solving a few problems. If he is serving the progress of your industry well, you may see little of him except when he is out after suggestions; he will be too busy in the library and the laboratory.

I do not want to sell even this, necessarily slow, learning too highly. When he has learned all the truth about some problem, there may be nothing you can do about it except just take it better standing up. And sometimes a useful discovery may bring you other difficulties; treatment for mottle-leaf has been highly beneficial, but Florida had more deficiencies than you and treatment may enable them to give you harder competition than before; scientific discovery is always the result of many earlier discoveries made in different parts of the world, reported to all interested scientists in the world, and available to all people in the world capable of using it.

Growing Light of Truth

Yet I do not believe you want to be back in the mottle-leaf days even if the competition was easier. Whether the fruit grower has greater profits or not, the scientific research has made his life richer, more beautiful because it is lived with more truth. In his "Ode to a Grecian Urn" Keats has its fine lines say to man: "Beauty is truth, truth beauty—that is all ye know on earth and all ye need to know." Perhaps for the poet the fact that only living truth can be

beautiful is all he needs to know. To all of us life without living, growing truth may be sordid.

A farmer once took me over a broken fence through weeds and brush to a tree that showed at its base a large crown-gall, a disease that has had most interesting study, but he thought a neighbor who didn't like him had slipped in at night and poured something around his tree.

Compare such a misguided and suspicious life with that of a man who is alert to all that is learned about his trees and their environment, uses all that can be applied but when full truth suggests that there is no remedy for some of his difficulties accepts the situation with shoulders back and eyes straight ahead. Thousands of men like this are managing orchards in different parts of the world, and even a great eucalyptus tree against a California sky is not as beautiful as such sturdy character against a growing light of truth.

New citrus products recently publicized: Pectin jelly as "cream centers" for chocolate candy; citrus juices reduced to hard candy form with retention of Vitamin C; citrus pectin filaments for sutures in surgery; grapefruit and orange seed for oil in the manufacture of plastics, and for four other purposes not yet disclosed.



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Volatile Oil

(Continued from Page 293)

practically the same for large and small fruits. The yield of oil per ton of fruit, however, was noticeably larger for the small fruits than for the large fruits. This was to be expected because the yield of oil is a function of the surface area of the fruit, and a ton of small fruits would have a larger surface area than a ton of large fruits. The high positive correlation between the yield of volatile oil on a given surface area of peel (100 sq. cm.) and the lbs. of oil per ton is shown in fig. 3. A graph of this type is of practical value in that total volatile oil content of the peel can be compared with the actual amount of oil extracted from the fruit by various commercial methods.

The differences between the yields for large and small fruits would, no doubt, have been larger had there been a greater difference in the sizes of fruits tested. In these tests the mean equatorial diameter of the large fruits was 2 3/4 inches and of the small fruits 2 1/4 inches. In other words sizes 200's and 324's, respectively. Attention may be called to the fact that Valencia sizes were small in 1945.

Stem End vs. Stylar End

A study of the relative amounts of volatile oil in the peel of the stem and stylar ends of Valencias was made because various portions of the peel sometimes react differently under pathological stimuli. The study was made also, to determine whether various portions of the peel contain different amounts of oil, just as various portions of the pulp contain different amounts of sugars and acids.

The results of this study show that considerably more oil was obtained from the stylar end than from the stem end of the fruit. Samples 1 to 6 were taken from the

peel about midway between the equator and the stem and stylar ends, respectively, of the fruits. Samples 7 to 12 were taken much closer to the stem and stylar ends of the fruits—the nearest edge of the disk of peel was about 1/4 inch from the exact center of the ends of the fruits.

The mean yields of oil from the two sets of samples were:

Samples 1 to 6		Samples 7 to 12	
Stem end	Stylar end	Stem end	Stylar end
Per 100 sq. cm.	ml.	Per 100 sq. cm.	ml.
1.05 ± 0.16	1.17 ± 0.15	0.76 ± 0.11	1.01 ± 0.13
Per ton	lbs.	Per ton	lbs.
17.0 ± 2.4	18.9 ± 2.4	12.7 ± 1.4	16.9 ± 1.5

In tests 1 to 6 the samples from the stylar end contained 11 per cent more oil than those from the stem end, while in tests 7 to 12 the samples from the stylar end of the fruits contained 33 per cent more oil than those from the stem end of the fruits.

These results show that the oil content of the peel of Valencia oranges increases progressively from the stem end to the stylar end of the fruit. A similar condition was found in navel oranges, although the differences were not so great and there were a few exceptions.

Summary

The yield of oil per unit area from Valencia peel shows very little change from the time the fruit is half grown until it is mature, but the yield per fruit increases in proportion to the increase in surface area of the peel. After the fruits have reached maturity, the oil content of the peel appears to be governed more by climatic and physiological conditions than by any change in the surface area of the fruit.

The oil content of the peel of

both Valencias and navels is highest in the fruits from the inland districts and progressively lower in those from nearer the coast.

Large fruits yield more oil than small fruits when expressed as yield per surface area, but the reverse is true when the yield is expressed on a tonnage basis, because small fruits have more surface area per ton.

Quantitative determinations show that the amount of the oil in the peel of Valencias increases progressively from the stem end to the stylar end of the fruit. In general, similar conditions hold true for navels but not to such a marked extent.

Adobe is Plentiful

INTEREST in adobe construction for homes has come down to us through the years from the dons and the mission padres of the Spanish period. It is still popular in our state. Many very fine homes have walls of adobe brick. They are quaint, charm-

ing, durable, and they seem to have grown right out of the California soil.

Adobe may prove a substitute for other building materials in the present shortage in areas where the soil is suitable for making adobe bricks.

Rural people interested in adobe construction may obtain a list of references from the Agricultural Extension Service on such subjects as adobe for farm buildings, hard surfaced floors for poultry houses, earth-wall constructions, earth-brick construction, waterproofing adobe and many other related subjects.

Two small farmhouse designs with adobe-brick exterior walls are included in the farm building plan service of the College of Agriculture, University of California. If you think you want to build a small adobe farmhouse, you'll be pleased to know that your county farm advisor can help you obtain plans and specifications for one. There is a small charge to cover cost of the prints and specifications, plus sales tax.



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To extend telephone service more widely in rural areas many new methods and developments are to be used. Radio may be used to carry telephone service to remote areas. Improved type of wire which can be plowed into the ground to eliminate poles will be used where conditions permit. High strength steel wire will be used for economical long-span construction where wires are strung overhead. And there will be service improvements such as fewer parties on the lines, fewer rings for other parties, replacement of crank type telephones with modern dial or other type instruments.

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★ The Home Page ★

LOOK TO YOUR OWN FOOD SUPPLY

We are hearing much again this year about home food production, but the emphasis has shifted since the war years. The problem of every homemaker is how to supply an adequate diet for her family, in the face of some of the shortages which well-informed sources say may occur.

During the war the emphasis was . . . raise meat animals and a garden, have a family cow and some chickens, put up fruits and vegetables and make cheese from surplus milk.

The present food crisis has changed things, so now the emphasis is . . . raise a year-round garden planned for year-round vegetable supply. Have the garden contribute as largely as possible to the total food supply of the family, and if possible share with your neighbors, if you grow more than you can use. Preserve eggs. Fish requires no critical feed and can be stored for winter food.

Thus far the program for home food supply does not involve critical feeds. There are several things further which are feasible only if you have

a feed supply available for poultry and livestock. Better be sure about the feed before you attempt to keep a cow and poultry for raising meat animals.

Meat and poultry may be stored. Also, surplus milk can be made into cheese and butter and some of the butter put into cold storage for future use.

Cook Once—Eat Twice

It may sound a bit on the lazy side but it's a mighty good practice to cook once and eat twice or going it one better, to mix once and bake thrice. There is many a neat trick to be worked out whereby one mixing will do the work of two or three, as far as eating goes, and it will also save on that beastly washing-up as well.

You feel like making a pie. Make up enough crust for the pie at hand and also line another pie dish, or turn out some cheese straws, or the left over dough may be wrapped in waxed paper and slipped into the refrigerator and used for "What & When", even a week from now.

When folks drop in, it's a solace

to know that yesterday's extra potatoes in the pot means a chance for potato salad to serve with the remainder of the meat loaf. Or with that double batch of noodles you cooked, there will be enough for a noodle ring, to be filled with creamed this-or-that from your emergency shelf.

Doubling the recipe for little Johnnie's "boiled" custard means a nice chilled sauce for sponge cake pieces topped with orange or pineapple slices.

Two cans of brown bread mean hot brown bread slices with the baked beans; chilled and thinly sliced, the bread becomes sandwiches for tomorrow's luncheon.

It's mighty nice to know that your cooking streak guaranteed you that coveted desire of all homemakers—a day away from the kitchen!

Orange Souffle

Here is an exceptionally tasty year-round treat. Fresh oranges are always available and if you have not tried the frozen coconut, give it a whirl!

Peel 6 oranges, divided into sections, remove white skin and cut into small pieces. Put layer of oranges into bowl, sprinkle lightly with sugar, then put on layer of coconut. Continue same until bowl is almost full. Pour over this bowlful a quart of cold egg custard, cooked thin. Chill thoroughly before serving.

Just to be Different

Next time you plan on Fricassee Chicken, serve it with fried mush to save on much needed flour.

Stir 1 cup cornmeal slowly into 4 cups boiling water. Add one small can deviled ham and cook until thickened, stirring all the time. Turn into greased loaf pans to chill. To serve, slice and dip in cornmeal. Brown each side in bacon or ham drippings.

Add a salad of mixed greens, with ice-cold coffee gelatin or Bavarian cream to finish off and there is A MEAL!

Something Easy and Good

Allow slices of beef liver, (1 pound) to rest two hours or more in ½ cup tomato juice with thinly sliced garlic. Drain, add salt and pepper, dip in flour, and cook quickly in hot drippings.

Serve with scalloped canned tomatoes (juice used for the liver), and hash-browned potatoes with minced onion; apple sauce and ginger cookies.

Lamb Trotters

Mighty good eating is this dish of lamb shanks, one to a person for a hearty serving, simmered until tender in boiling water, the amount depending on how much thin gravy is de-

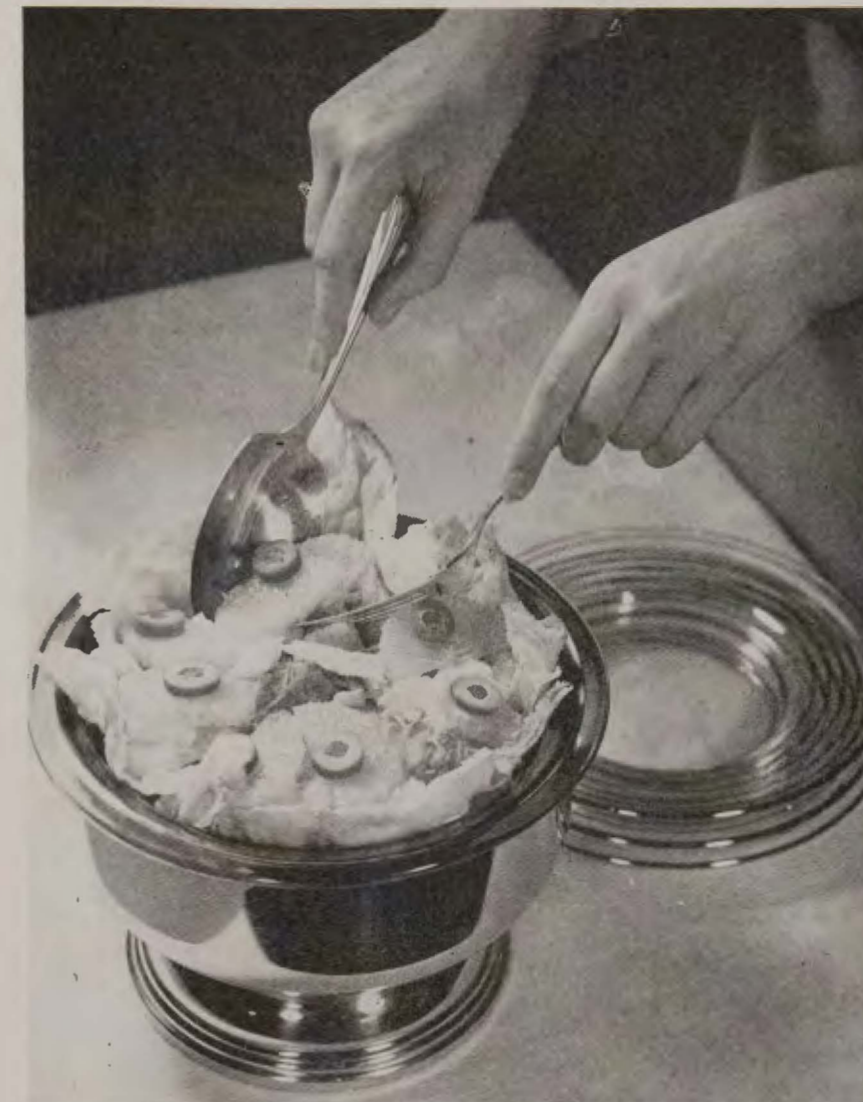
sired. For flavor add an onion, celery tops, salt, pepper. Allowing just enough time for the vegetables to cook, add small whole carrots or carrot strips, scraped new potatoes. When nearly cooked, stir in 1 cup or more of fresh or frozen peas, adding a thin flour paste made with water or cream for thickening. Turn into a casserole and serve with rice muffins, a green salad, and not much else except cookies and coffee, meebby.

Any yeast dough may become a "refrigerator dough" if the yeast content is increased by at least one-half, or even doubled, plus a little extra sugar. Keep greased and well-covered, and COLD!

Remember, your table can get that same sort-of-drab look as your winter furnishings. So plan to let the beef pot roast with its rich brown gravy and mashed potatoes give way to lamb casserole with its medley of small whole potatoes, new peas, carrots. Replace the heartier steamed puddings and their luxuriant sauces with refrigerator desserts of well-chilled fruits and simple wafers.

To prepare poultry or liver for the frying pan, mix just enough flour and salt in a small bag to cover meat. Drop two or three pieces at a time into the bag, shake, and presto, the meat or fowl is ready for the skillet.

Scorched white shirts can be bleached* with a sun lamp. Irradiating dampened singed areas the ultraviolet helps restore shirts to original whiteness in about ten minutes.



Orange Chicken Salad

Whoops! It is time to serve the ever popular chicken salad so we suggest this combination with oranges and the usual celery. Oranges combine well with meat, they are always in the market, and the California oranges are particularly good for salad because of their ease of segmenting or slicing.

- 2 cups chicken (or veal)
- 2 cups celery
- 2 cups orange slices (or segments)
- 1 cup seeded grapes
- ¾ cup toasted almonds
- Curly endive
- Lemon French or Fruit Salad Dressing

Cut chicken and celery in small pieces. Blend with halved orange slices, grapes and salad dressing. Let marinate a short time and put in a salad bowl lined with curly endive or other crisp salad greens. Garnish with slices of stuffed green olives.

Lemon French Dressing

- ¼ cup lemon juice
- ¼ cup salad oil
- ½ teaspoon salt
- ½ teaspoon paprika
- 1 tablespoon sugar
- or honey

Stir or shake thoroughly before serving. Lemon juice brings out flavors. It is especially nice in dressing to be served with a meat salad.

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Fruit Salad Dressing

- 2 egg yolks
- ½ cup maple sugar
- 1 tablespoon sugar
- 1 tablespoon flour
- Juice of one lemon

Beat egg yolks and mix with other ingredients. Cook until thick. Stir constantly. Add about three cups whipped cream when cool. Blend with mixed fruits.

It is reported that a new process is being perfected to overcome the two main objections to woolen materials—during the process of manufacture the cloth may now be made unshrinkable and be permanently mothproofed.

To mend a small hole or tear in a coat, ravel yarns from a straight inside seam. By using self-thread it is possible to darn a garment so neatly that the repair will be invisible.

Frozen poultry should be thawed in the refrigerator for several hours. Never soak in water as this causes a loss of juices.

To freshen up your stored summer clothing and discourage moths, turn on the electric fan in your closet, for an hour or so each week.

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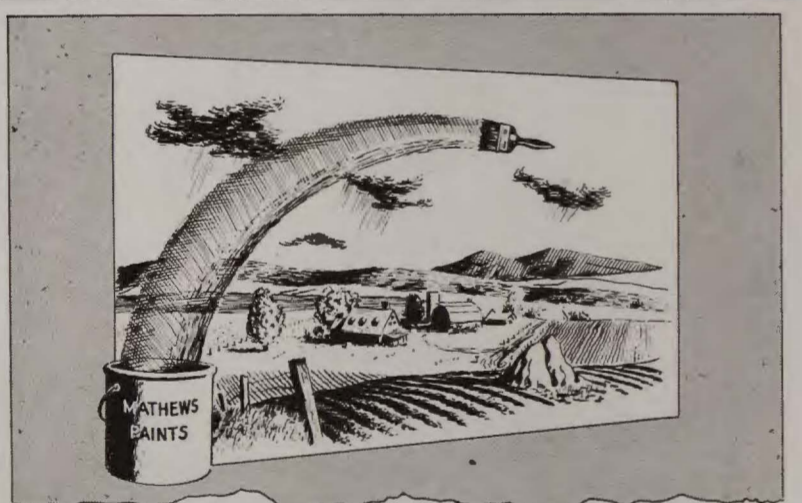
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Eye appeal... Buy appeal

We can't add eye-appeal to fresh fruits . . . Nature does a perfect job. But we can . . . and do . . . add buy-appeal by means of the labels on the boxes that carry the fruit to market. Schmidt-created case labels take full advantage of this precious advertising space. Schmidt-created Point-of-Purchase advertising also helps to keep fresh fruit crops moving. We've worked hand-in-hand with growers and shippers since the production and marketing of fresh fruits first became a major western industry. Wherever there are products to sell and markets to build, you'll find our creative service invaluable.

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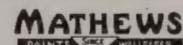
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Beautify and protect your home with MATHEWS colorful, long-lasting Paints. If you require a reliable, professional painter . . . we will gladly recommend one from our list of dependable painter contractors. SHOP AT THE MATHEWS PAINT STORE

for Mathews Paints, Wallpapers, brushes, popular brand household cleaners and floor finishes, picture frames, artist supplies, Pratt & Lambert Enamels and Varnishes.



Mathews Paint Co., Inc. SINCE 1887 . . . Stores at: Los Angeles, Pasadena • Monrovia • San Francisco • Phoenix, Arizona

Shop at the Mathews Paint Store near you or send your order through Fruit Growers' Supply Co.

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Deluxe Model A

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Rates: Fifty cents a line, cash with order. Minimum \$1.00.

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Listings wanted, can sell that orange grove. Have some top producers for sale, all ages and sizes.

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An orange grower since 1924

15 acres valencias, no smudging, fog three times in 18 months, good view, modern five room house, tractor, equipment, \$4000 per acre. R. H. Sharrow, Valle Vista, Hemet, Calif. Phone Hemet 4672.

NINETEEN and one-half acres Valencia oranges in Los Angeles County on Whittier Boulevard at Jordan Road. \$55,000. 4400 District Blvd., L.A.

NURSERY STOCK

FOR SALE—Bargain for quick sale; must vacate land; 18,000 sour seedlings; splendid roots; prefer lump sale; you dig and pack. Cyrus W. Wilhite, 175 Alosta Ave., Glendora, Calif.

FOR SALE—2-yr. Valencia trees on sweet root. Fred W. May, 613 W. 8th Street, Santa Ana, Calif. Phone 3821-M evenings.

BUDDING AND GRAFTING

Top-working orchard trees a specialty
J. W. Eckhoff, 1191 E. Holt, Pomona, Calif.
Phone: Pomona 16519

VALENCIA & Eureka lemon yearling trees on sweet, sour & grapefruit root. Careful bud selection. Contract now for spring delivery. Gray Nursery Co., 540 No. Rosemead Blvd., Temple City. Atlantic 4-1674.

CITRUS TREES

Several hundred one year old Lemon, Navel, and Valencia trees for June delivery

TETLEY NURSERIES

844 West Sixth St. Corona, California

FOR SALE—Avocado seedlings. Ready June 1. 20c ea. in lots of 500 or more. Jack Wullbrandt, Carpinteria.

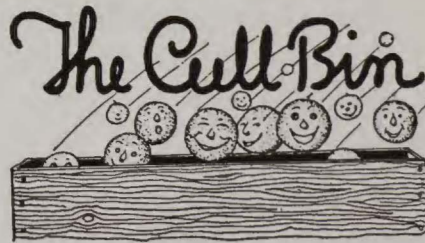
FOR SALE—SWEET SEEDLINGS. GROWN WITHOUT COVER. PHONE—FULLERTON 202J.

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POSITION wanted as Ranch Superintendent. College of Agriculture at Davis graduate, major in Horticulture. Several years experience in citrus, walnuts, grapes and general farming. Also some experience in olives and deciduous fruits. Address Box H, California Citrograph.

POSITION WANTED—Superintendent or Foreman of Citrus Ranch. Many years experience. Best reference. Box N—CITROGRAPH.

One railway carload of canned orange juice, concentrated to one-fifth its normal volume, is equal to 30 cars of fresh fruit.



"Tell me, Editor, how do you make up the jokes for your paper?"
"Oh I just laugh, then think backwards."

Vaudeville Actor: I have an act that I'd like to show you.

Agent: Go away, I'm busy.
Actor: But this act is different.

Agent: That's what they all say.
Actor: But I've got a monkey that plays the piano.

Agent: Well, bring him in then.
(The monkey proceeds to play selections from Beethoven and Bach.)

Agent: I'll give you \$1,000 for that act! (Enthusiastically.)

Actor: But that isn't all. I've got a mouse that sings.

Agent: A mouse that sings! I don't believe it but bring him on.

(Monkey accompanies and mouse sings.)

Agent: (More enthusiastically) I'll give you \$3,000 for the act!

Actor: Before you buy, there is something I ought to tell you. The mouse doesn't really sing.

Agent: —but I just saw—

Actor: No, the monkey's a ventriloquist!

A blushing young woman handed the telegraph clerk a telegram, containing only a name, address, and one word, "Yes."

Wishing to be helpful, the clerk said: "You know, you can send 10 words for the same price."

"I know I can," replied the young woman, "but don't you think I'd look too eager if I said it 10 times?"

A traveler in the Dogpatch country stayed overnight in a backwoods dwelling. The next morning he spent some time on the back porch with a basin of water, a razor, soap, comb, brush and so on. A small boy watched wide-eyed for some time and finally said, "Gorsh, mister, are ye always thet much trouble to yerself?"

The negro woman stated she had four children, and the Florida relief worker asked her their ages.

Violet: "Ah don't zactly remeberbah, but ah's got one lap chile, one floor creeper, one porch chile, and one yard yungun."

She—"Before you went away you said I was all the world to you."

Returned Sailor—"Yeah, but I've learned a lot of geography since then."

Man is that peculiar animal who gets many a hearty laugh out of an old family album, but looks in a mirror without so much as a grin.

A young girl talking to her grandfather, asked, "Grandfather, how old does a girl have to be to get married?"

Grandfather: "She must be old enough yet young enough, big enough yet little enough, wise enough yet dumb enough, weak enough yet strong enough, to chase a man until he catches her."

Father: "Did you put your penny in the Sunday School collection, son?"

Tommy: "No, dad, I lost it."

Father: "But this is the third week you've lost it!"

Tommy: "I know, but that other kid's luck can't last forever."

Wrangler: "Will this anaesthetic make me sick?"

Doctor: "No, I think not."
Wrangler: "How long will it be before I know anything?"

Doctor: "Aren't you expecting too much of the anaesthetic?"

Beneath the spreading chestnut tree
The smith works like the deuce
For now he's selling gasoline,
Hot dogs and orange juice.

San Joaquin Poultryman

City Motorist: We helped ourselves to your apples and pumpkins, old man. Just thought we'd tell you.

Farmer: Oh, that's all right. While you were in the orchard and garden I helped myself to your spare tire.

Pa: "You've been takin' vitamin pills and still feel run down? What have yo been eatin'?"

Ma: "Oh, do ya have to eat, too?"

Young woman (in telephone booth): "Certainly my call is essential. I want to make dates and get married and have a home."

Customer: "I want to buy a plow."
Clerk: "Sorry, we have no plows."
Customer: "This is a heck of a drug store!"

Bellhop: "Telegram for Mr. Sleidopavrikanowski."
Mr. Sleidopavrikanowski: "What initial, please?"

First G.I.: "The touch of the nurse's hand cooled my fever instantly."
Second G.I.: "Yeah, we heard the slap all over the ward!"

Conductor: "Your fare, young lady."
Young lady: "You're nice looking yourself."
P.S.—She rode for free.—

"Little boy, do both of your dogs have licenses?"
"Yeah. They're just covered with them."

The emptier the pot the quicker it boils. So watch your temper.

The fatal tendency of mankind to leave off thinking about a thing, when it is no longer doubtful, is the cause of half their errors.—John Stuart Mill.

Marvin B. Rounds

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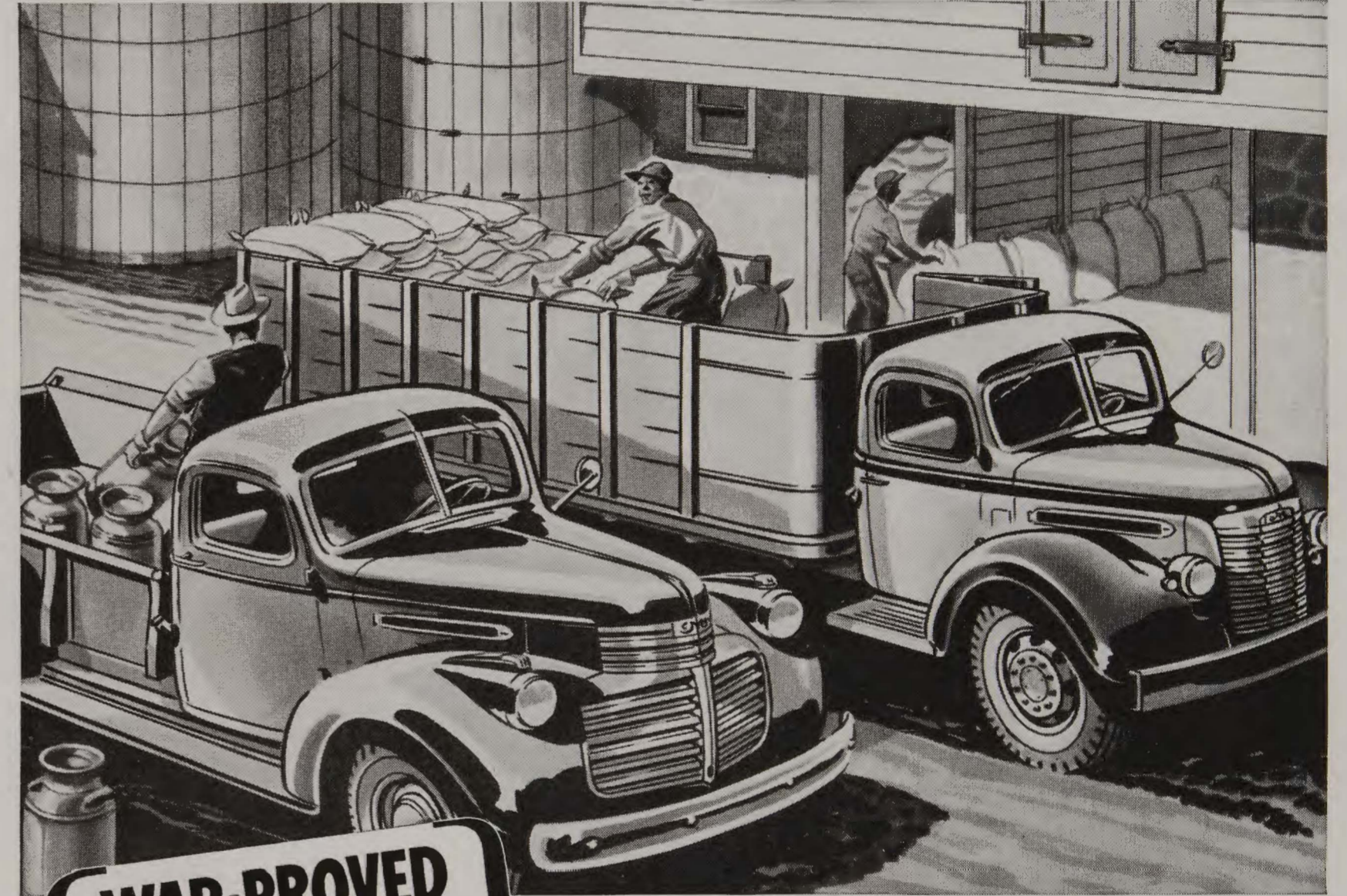


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• Powerful, economical "Army Workhorse" engines of Valve-in-Head design with Tocco-hardened Crankshafts, Airplane type "Durox" Main Bearings, Heat-resisting Exhaust Valves with improved Valve Seat Inserts, Positive Crankcase Ventilation, Turbo-Top Pistons and Full Pressure Lubrication through Rifle Drilled Connecting Rods.

• Rugged, built-for-the-job chassis with extra strong Frames, Springs and Axles, heavy duty Transmissions and Clutches, Needle Bearing Universal Joints, Recirculating Ball-Bearing Steering and powerful, easy-action Brakes.

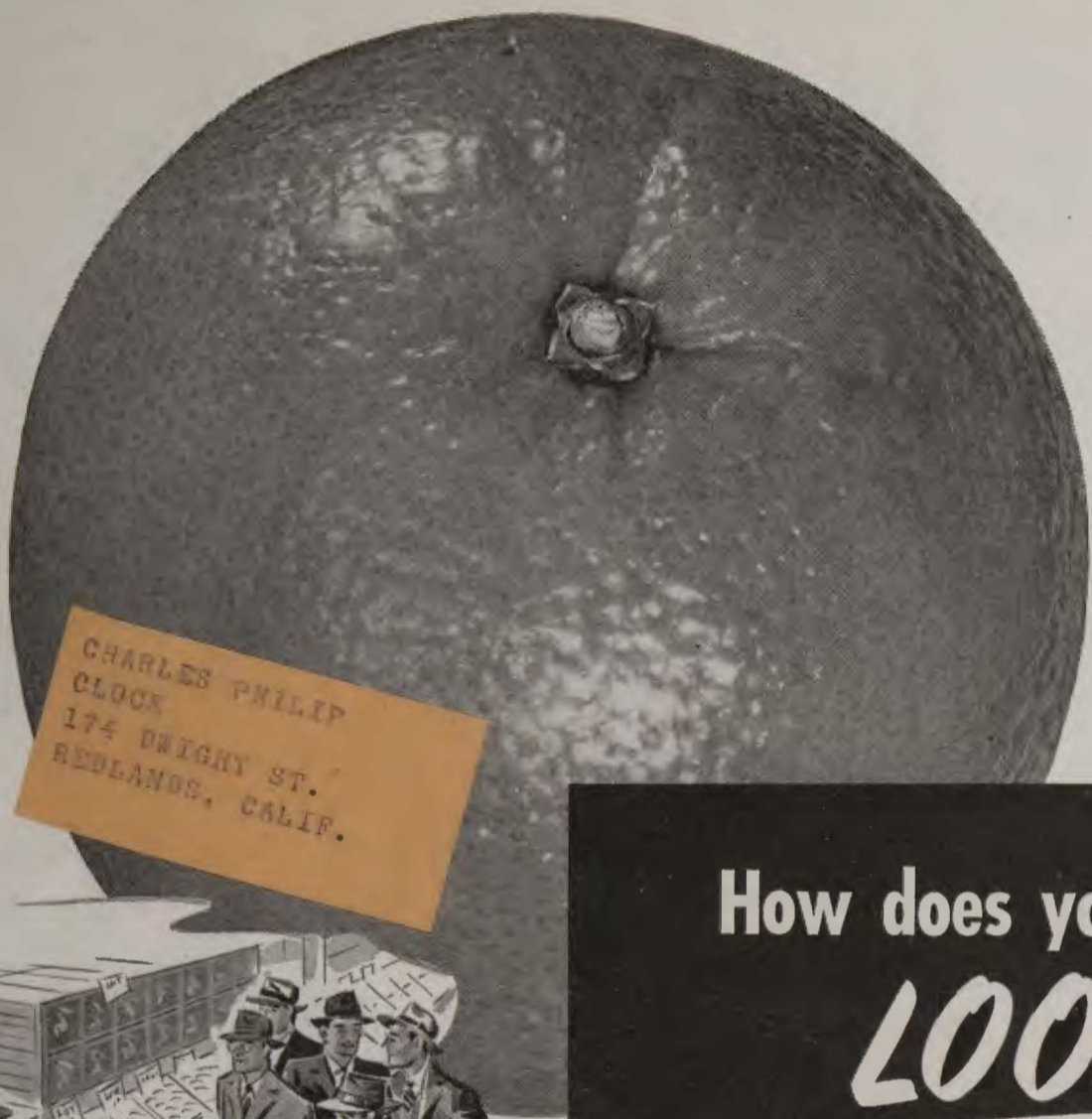
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How does your fruit
LOOK
when it reaches market?

Your profits depend in large part on the answer to that question. The quality of your fruit is judged thousands of miles from your packing house. Fruit that has been Hypo-Clor Sterilized and Flavorseal Protected DOES reach market cleaner, sounder and fresher... *it looks better than unprotected fruit!* Spoilage is reduced to a minimum and original flavor and vitamins are preserved almost intact.



builds preference for your brands

Study the list of prominent citrus shippers who use Hypo-Clor plus Flavorseal. These companion processes have helped build the reputation of scores of famous brands. Fruit thus protected, helps protect the jobber and retailer against profit losses due to spoilage and shrinkage, builds valuable customer goodwill, *sells better because it looks better, tastes better, and keeps better.* The result is greater year 'round profits.



Write for details about Hypo-Clor plus Flavorseal, and for the list of Flavorseal shippers and brand names. They are names you will know well. Address:

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