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The Agricultural Situation And The Outlook In Mid-'47

H. R. Wellman

Condensed from an address delivered before the California State Association of County Assessors, Sept. 2, 1947, San Francisco, California.

The outstanding fact in the present agricultural situation is the current high level of farm incomes.

Up to 1945, net farm income in California increased more rapidly than in the country as a whole. Over the past two years production expenses of California farmers have risen about as much as cash receipts from farm marketings.

During the first four months of this year cash receipts from farm marketings in California were nine per cent larger than in the corresponding period of 1946. This gain occurred in livestock and livestock products; cash receipts from crops were slightly below last year.

Among the major classes of agricultural products, fruits alone are bringing less money this year than last. But fruits are a very important component of California's agriculture, much more so than in the rest of the country. In 1946, for example, 35% of California's cash receipts from farm marketings came from fruits; in all other states combined only four per cent came from fruits.

In March of this year the index of prices received by farmers in the United States reached a new high record, 20% above the 1946 average and 125% above the 1941 average.

Prices Result of Demand

The explanation of high farm prices is to be found in the demand situation.

Domestic demand is exceptionally strong with national income and employment at record high levels. Foreign countries are eager for our exportable surpluses.

The 1947 farm output in this country is large and is bringing high prices. Thus far in 1947, national cash receipts from farm marketings have run well ahead of those of 1946.

Farmers are in an excellent financial position; in the aggregate they have reduced their debts substantially since 1940, and in addition have accumulated large liquid assets.

The Outlook

Despite the current highly favorable situation farmers are somewhat apprehensive as to the future.

This apprehension stems in part

(Continued on page 2)

Pre-emergence Spray For Weed Control In Sugar Beets Seeded In Undisturbed Soil Successful

W. W. Robbins and Roy Bainer

Preliminary field tests on the University Farm, Davis, indicate that pre-emergence spraying offers promise as one method of controlling

and floated; a portion of the area was left flat, the remainder ridged and formed into beds; the field was left in this condition throughout the

mostly in the seedling stage.

Decorticated sugar beet seed was drilled in at three different depths: 1 inch, 1½ inches, and 2 inches. A



Control of weeds in sugar beets by the use of pre-emergence sprays. A. Normal weed growth at the time of spraying. B. Adjacent soil after spraying. Beet seedlings appeared in these plots within five to six days after spraying. C. The strip of weedy growth in the middle was unsprayed while the soil on either side was sprayed. D. The plot in the right foreground was sprayed, the surrounding soil was not sprayed. Plots C and D were neither cultivated nor irrigated. The photographs of these two plots were taken about 45 days after spraying.

weeds in sugar beets. The method may be applicable to other row crops.

The field tests were as follows: In December the field was disked

winter; seedings to sugar beets were made on February 24 and March 12.

At the time of seeding there was a good growth of various winter weeds,

precision drill was used, the seeding rates ranging from four to five pounds per acre.

(Continued on page 2)

Bulk Handling of Milk By The Ranch To Factory System

E. L. Jack and R. L. Perry

Milk-holding tanks on dairy farms, used in conjunction with tank trucks, are bringing about savings to the dairyman and to the milk buyer through the elimination of the ten-gallon milk can.

Traditionally, milk on the farm is run over a cooler to bring the temperature down below 50°F. It goes from the cooler directly into a ten-gallon can where it is held in a cold room until hauled to the milk plant.

In this new method the milk goes into a large storage tank on the farm instead of into the cans. It is pumped from the storage tank into a tank truck and hauled to the milk plant.

This bulk-handling method saves a considerable tonnage in hauling; does away with handling the cans on the ranch, on the truck and in the plant; recovers more milk than is possible in cans; and does away with can washing.

Direct Benefits to Dairyman

Some of these savings benefit the dairyman directly. He does not have to have someone attend the cooler during milking to fill the cans and put them in the cold room. On larger dairies this one feature alone may save the expense of one man.

The dairyman also gains directly in the amount of milk for which he is paid. Under the tank system he is paid for all the milk that is in the tank when the truck arrives. It is measured there directly. Under the can system he is paid only for the amount of milk that drains from the cans at the milk plant receiving platform. Approximately one-eighth of a pint remains in each can and therefore is not weighed. This additional recovery of milk is estimated by one firm to increase the annual receipts of a dairyman shipping twenty cans per day by 750 pounds a year.

There is also a great savings in hauling. A ten-gallon milk can which holds 86 pounds of milk weighs in the neighborhood of 25 pounds when empty. This means that approximately one-fifth of the total load of milk in cans comprises container weight, rather than milk weight. At prevailing rates milk is hauled in tank trucks from ranch to factory from one-half to six-tenths of a cent per gallon cheaper than in ten-gal-

(Continued on page 2)

Citrus Orchard Cost Study And Analysis Made In Orange County Over 21-Year Period Is Reported

Harold E. Wahlberg

Over one hundred citrus growers in Orange County have cooperated with the Agricultural Extension Service for the past 21 years in a cost study and analysis of orchard management.

The growers furnished detailed cost reports on their orchard operations. The reports were summarized and divided into two groups—the higher return orchards and the lower return orchards. An average was struck for the entire study. A wide range of costs was reported in most items.

Fertilization

Fertilization is an example of the wide range of operational costs.

In 1946, one grower reported a fer-

tilizing cost of \$137.18 per acre. Another grower spent only \$7.16 per acre. The best 20 orchards averaged \$41.03 per acre and the average of all orchards was \$53.65 per acre.

In most years the orchards with the highest fertilizing costs were not the top orchards. The extra dollars spent, often for the more expensive mixes, did not justify the added expense.

It appears from these studies that about three pounds of nitrogen per mature tree, in normal thrift, is optimum. Very large trees may use four to five pounds.

Last year, three pounds of nitrogen per tree at 80 trees per acre, cost

(Continued on page 3)

Control Measures In Trichomoniasis Abortion By Cows

H. S. Cameron

Abortion and sterility constitute major sources of loss to the dairy cattle producer.

Infection is probably responsible for the greater portion of these losses, and brucellosis is, by far, the leading offender in the classification.

Bovine trichomoniasis should be considered as next in importance, because serious losses can result when the infection gets into a herd and is allowed to persist.

Unlike an abortion storm from brucellosis the onset is very gradual, the first thing noticed being an unusual number of cows, assumed with calf, returning to heat.

Bull Is Carrier

The disease is transmitted only by

(Continued on page 4)

Water Infiltration Rates Into Yolo Loam Studied To Determine Irrigation Efficiency Factors

Arthur F. Pillsbury

Water infiltration rates into Yolo loam during irrigation were measured in 96 basins in a series of experiments conducted in Los Angeles County over a period of five years.

Several different treatments were carried on, permitting the isolating of a number of factors which influence the rate of water entry into the soil.

Organic Matter

Organic matter is known to improve soil structure and infiltration rates, but the belief often prevails that to do so it must be incorporated into the soil.

Applications of straw or other crop residue as a mulch were found to be at least as valuable on the surface

as when incorporated in the soil—provided they were kept relatively moist so as to decay rapidly. Normally, there was insufficient decay through the summer to cause appreciable infiltration rate increases.

After a mulch had been in place for a while during the winter, increases in the rates of water infiltration were up to seven times greater than the rates in those plots without mulch.

Benefits from organic matter are largely from the products of the rotting mulch which are carried into the soil by the water.

Shade

Since organic matter mulch shades

(Continued on page 3)

Citrus Orchard Cost Study And Analysis Made In Orange County Over 21-Year Period Is Reported

(Continued from page 1)

about \$30.00 per acre. If manures were applied to supply some of this nitrogen the cost went up to almost \$50.00 per acre.

From data the growers supplied it appears that the grower who spent more than \$50.00 to \$60.00 per acre on his fertilizer budget last year could not justify the extra cost.

Nitrogen and organic matter, with an application of zinc spray for zinc deficiency, have been recommended by the Agricultural Extension Service as an efficient fertilizer program. Organic matter may be added in the form of cover crops or manures. If the orchard is under the non-tillage system of soil management, additional organic matter may not be so necessary because the soil is not stirred and the organic matter is not consumed or oxidized so rapidly.

Conservative Irrigation

In the first years of this study, the average use of water was 21 acre inches per acre. In recent years the average use has been 17 to 18 acre inches per acre.

Many orchards in Orange County have declined in vigor and production because of excessive use of water.

In sandy soils too much water has leached down the soluble plant food elements to below the root zone. In heavier soils, too frequent or too early irrigation created a soggy environment around the roots and gradually reduced their vigor by the exclusion of essential soil air.

Use of Irrigation Water Per Acre

Prepared from water-use reports for the period 1942-1946

	Conservative	Heavy	Light
Range of use	14-20 acre inches	21-48 acre inches	7-13 acre inches
Average use	17.1 acre inches	29.0 acre inches	11.4 acre inches
Yield per acre	295 packed boxes	239 packed boxes	182 packed boxes
Value of fruit	\$867.30 gross p.ac.	\$692.66 gross p.ac.	\$535.08 gross p.ac.
Cost of			
Water—5 yrs.	\$60.50 per acre	\$103.24 per acre	\$40.58 per acre

Here is tangible evidence that conservative irrigation pays good dividends.

Several orchards in the light group reduced the water used because of weak trees. The production from such trees naturally would be lighter than from normal trees.

Guides for an Irrigation Program

Here are some general rules for an irrigation program.

1. Apply water only to dry soil actually occupied by tree roots.

2. Do not apply water to soil that remains wet. Roots in soil continually wet will deteriorate and cause chlorotic—yellow—leaves, and finally defoliation.

3. Apply only enough water to penetrate as deep as the roots grow. Water which percolates below the root zone is wasted and leaches nitrates below the root-feeding area.

4. Adapt the irrigation program to soil and climatic requirements. Chart your orchard to determine variations in soil types.

5. Use a soil tube or auger to determine the actual condition of soil moisture during the irrigation season.

Cultivation

Every year, during the 21 year period, orchards in the higher profit group and reporting low cultivation costs were found next to orchards reporting high cultivation costs.

Last year, the top orchards reported an average of \$27.23 per acre for cultivation. The highest cost was \$61.45 per acre and the lowest in that group was \$9.32. These figures are typical for every year in the study.

Records of orchards operated on the non-tillage system indicate that the first year's cost, for setting up permanent furrows and frequent spraying for weed control, is about \$60.00 per acre. The second year's spraying costs about \$35.00 per acre and the third year's spraying, about \$18.00 per acre. In the succeeding years the cost tapers down to very low figures.

Labor Costs

Farm records of 20 years ago, just after World War I, show general farm labor received 40c an hour and tractor drivers, 60c an hour. Today,

the reports show 75c to \$1.00 an hour for general work and \$1.00 to \$1.25 an hour for tractor men.

The average cost per acre for pruning labor in the five year period, 1926-30, was \$10.47 per acre for Valencias. In 1945, for the same operation, the average cost was \$31.14 per acre.

In the late 20's the average harvesting cost was 16c per packed box. Last year it was 37c per packed box.

In 1930—a small crop year—yields averaged 142 packed boxes per acre. The grower received \$4.99 a packed box. Sixteen years later—1946—in another small crop year, the average yield was 166 packed boxes per acre. The grower received \$3.40 a packed box in 1946.

Economic Factors

Important economic factors influenced those prices and returns.

In 1930, the total shipments of Valencias amounted to 10,300,000 boxes from 96,200 acres of orchard. The rate of consumption was 12.5 oranges per capita.

In 1946, total shipments were reported at 27,100,000 boxes from 148,700 acres of orchard. The per capita consumption was 36.1 Valencias, or three times the 1930 figure.

The total amount of oranges, of all varieties and sources, consumed fresh was 46.2 oranges per capita in 1930 and 98.8 oranges per capita in 1946.

Last year, 37.4 oranges per capita were diverted to juices and by-products.

The total production in 1946—a small crop year—was 136.2 oranges per capita.

Efficiency Hints

Here are suggestions for orchard efficiency.

Keep simple tree records for a four-year period to determine the poor, the average, and the good producing trees. One and a half hours per acre spent each year on the average sized orchard are sufficient to keep production records. Too few citrus growers keep individual tree production records or replace low-producers with good trees or improve environmental conditions so that yields will be increased.

Chart your orchard to determine variations in soil texture, depth of soil, the number of trees missing, and the number and location of diseased, gophered, or low-producing trees.

Determine if low-producing trees are the result of spots of infertile soil or due to variations in soil moisture conditions. Increased applications of fertilizer to poor spots have usually caused marked improvement in yields.

Adapt irrigation practices to variations, in soil, don't irrigate soil that is moist.

Replace all missing trees with certified scaly-bark-free nursery stock. Irrigate replants more frequently than the old established trees.

Treat all beginning stages of scaly-bark, root rot, and brown rot gummosis.

Keep a close check on gophers. Inarch gophered trees as soon as possible after injury. Water inarches as you would a young replant.

Replace all trees that have been low-producers for a four year period unless low-production is caused by soil conditions or other factors that would prevent inherently good replants from becoming good producers.

Apply between two and three pounds of nitrogen per tree per year and small applications of organic matter by cover crops or manure if the orchard is cultivated. If the orchard is under a non-cultivation system, the addition of organic matter may not be necessary.

Place fertilizer so that it will get

Infiltration Of Water Into Soils During Irrigation

(Continued from page 1)

the soil surface there was the question as to whether or not the shade might be a factor in an improved rate of water entry.

Furrows under the skirts of citrus trees, where there is shade, have long been known to absorb water more readily than furrows exposed to the sun.

There is also the factor that raindrops puddle the surface of a soil, slowing infiltration. Organic mulches and the skirts of citrus trees break the impact of raindrops.

In these experiments, some plots were provided with louvre type shades which provided ventilation and admitted rain, but broke the impact of the raindrops. Principally, the shade intercepted the direct rays of the sun. The plots were kept bare of vegetation and were compared with similar bare plots without shade.

Shade, and the breaking of the impact of raindrops, did not increase the rate of water entry. In fact, those rates were significantly lowered.

It is known that infiltration rates increase with the drying out of the soil prior to irrigation. Shading did decrease the rate of drying, and this fact is presumed to account for the lower rates of entry.

Disposal of Crop Residue

Many of the basins were periodically cropped with corn, pole beans, or peas.

The crop residue was disposed of in three ways: (1) Chopped up and left on the soil surface—or cultivated into the soil. (2) Cut off and removed. (3) Chopped up and burned on the soil surface.

The effect of leaving the residue was to increase the water penetration rate in relation to those basins where it was removed. Where the residue was burned, infiltration rates were lowered to about equal to those plots where the residue was removed.

Tillage

Some basins were periodically tilled and others were not cultivated at any time.

Planting was done merely by poking a hole into the soil with a stick, inserting seed, and covering with imported soil.

Tillage was done infrequently with shovel, hoe, and rake so there was no tendency to form a cultivation pan of "plow sole" and no appreciable tendency to break down the structure of the surface soil. Under these conditions, tillage did not have any significant permanent effect upon infiltration rates.

Tillage does bulk and permit the drying out of the soil, and, where an irrigation followed the tillage, there was a temporary increase in the rate of water entry. Usually this increase appeared to persist for possibly 15 minutes to one-half hour.

Where a two inch deep irrigation was applied just before an irrigation for measurement of infiltration rate, this temporary increase was never

into the soil actually occupied by roots.

Zinc sprays may be necessary to correct mottle leaf, a symptom of zinc deficiency.

Plan your pest control program with your agricultural inspector. Don't experiment with unproved methods or materials.

Cultivate only when necessary to control weeds, to prepare the soil for irrigation, pest control, picking and other necessary operations. Cultivate as shallow as practical to avoid cutting feeder roots.

Normal healthy orange and grapefruit need very little pruning. Lemons need moderate pruning to size up the fruit. More fruit is lost by "opening up" the tree to encourage inside fruit than is gained.

Provide for adequate heating equipment in good operating condition—45 heaters per acre—and sufficient storage capacity to meet any emergency. Know when and how to heat. Lighting too early wastes oil; lighting too late may cost the crop.

Learn to recognize and to control scaly-bark or psorosis, brown rot gummosis and root rot and decline.

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Spraying Liquid Insecticides, Fungicides And Herbicides By Plane Lessens Drift Problem

O. C. French

Spraying insecticides such as DDT in liquid form by airplane may greatly reduce the drifting problem encountered when spreading poisonous dust by plane.

Finely atomized spray will drift under certain conditions but spray droplets generally are larger and many times heavier than dust particles.

Spraying by Plane

There are several factors affecting the efficiency of liquid spraying by plane, some of which are beyond human control. These are wind velocity and direction, and air stability. Anything other than stable air is adverse to the deposition of small droplets.

A predominance of large droplets

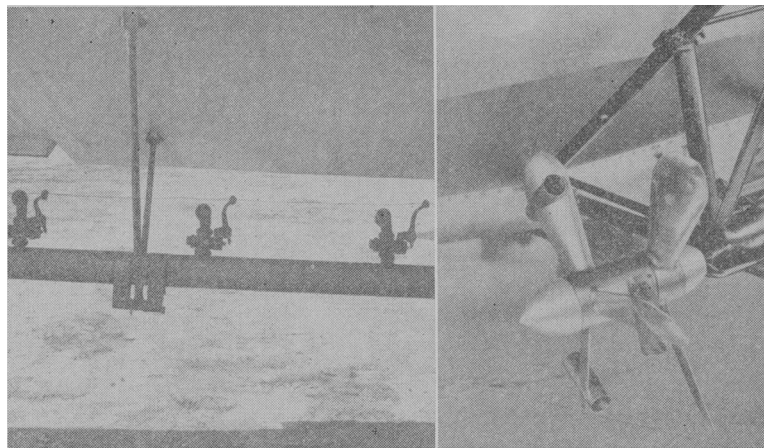
latively close to the ground and there are only short periods during the day when stable air conditions exist in this portion of the atmosphere.

The width of the spray-swath is less than a dust-swath but the actual acreage treated during a given weather period may be more. Spraying can take place while air current velocities are higher than are permissible for dusting.

The spray-swath width is influenced by the height of the plane above the ground, by the design and power of the plane; and by the location of the dispersing device with relation to the slip stream of the plane.

Spraying Devices

The planes being used for liquid application are, in general, of the



(Left) Close-up view of the nozzle arrangement of boom. Nozzles are attached to top side of boom and discharge to the rear. This location of nozzles is used to apply 2,4-D spray where large size spray droplets are desired.

(Right) A rotating type liquid dispersing device. Liquid is forced out from hub through prop blade to the little venturi tubes on each of the three blades. A screen is built into each venturi through which liquid passes and is atomized.

which have sufficient mass to overcome eddy air currents tends to reduce the efficiency of the spray solution.

It is apparent that a compromise is necessary as to the degree of atomization of the droplets.

Aerial spraying is carried out re-observed in the latter irrigation.

Fertilizers

Some commercial inorganic fertilizers are known, under certain conditions, to affect infiltration rates.

Sodium nitrate may cause an exchange of sodium for calcium on the wet, paste-like mass—the colloid—which results in a separation of the soil particles and a sealing of the soil pores, causing a decrease in water penetration.

Ammonium fertilizers may have, indirectly, much the same effect—if concentrations are such as to make the soil sufficiently acid.

In these experiments, fertilization was at a rate of 100 pounds of nitrogen per acre per application. Three fertilizers were used: sodium nitrate, ammonium sulfate, and urea. There was one application per year.

Los Angeles city water was used for irrigation throughout. It is moderately low in salts for this region, and has a favorable calcium-sodium ratio.

In these tests, neither sodium nitrate nor ammonium sulfate caused a decrease in infiltration rates when an effort was made to apply it in such a way that concentrations would not be high. When these fertilizers were spread over the soil surface just prior to irrigation, a subsequent lowering of the rate of water entry was noted in each case. The effect was greater and persisted longer with sodium nitrate.

Under these conditions, both fertilizers can be safely used with lighter applications, or with similar applications in the irrigation water, without ill effects.

Depth of Effects

There has been reason to believe that some of the effects herein described are limited to a surface crust of soil. At one time a surface crust, about 1/2 inch in depth was skimmed off all of the plots. This operation brought no change in the effects described and it is assumed that they were not limited to such surface crust.

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(Continued on page 4)