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California Prune Industry May Face Market Adjustment

S. W. Shear and George B. Alcorn

During the next few years the California prune industry will probably go through a period of difficult adjustment largely because of the poor and uncertain foreign market outlook. Demand for California dried prunes will have to be increased or bearing acreage and average production decreased before prices can be expected that, without government support, will encourage efficient growers to maintain most of the good prune orchards in the state. During the next few years prices and overall demand for California dried prunes will probably continue to be held down: 1. At home, by keen competition from very plentiful supplies of fruits and popular fruit products; 2. Abroad, by considerably lower commercial demand and imports for our prunes than prevailed before the war, particularly in European markets.

Prune orchards with old and low-yielding trees, producing fruit of poor quality and small size, will probably be unprofitable again as before the war. Owners of these poor prune orchards should, therefore, give careful consideration to replacing them with other crops to which their land is adapted and for which better returns might be expected in the long run than from prunes. However, growers with good-sized fruit probably should not replace their prunes with other crops unless they are convinced that by so doing they can increase their returns significantly during the next 10 or 15 years. There is some probability, although no absolute assurance, that reduction in prune acreage and production within the next five years may more than offset the expected low level of domestic demand and of decreased exports, so that the supply and demand for California prunes may come into balance at prices that will give efficient growers with good orchards as

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Beet By-products In Mixed Rations As Livestock Feed

The sugar-beet industry offers two important by-products to the livestock industry: sugar-beet tops and siloed beet pulp. Both of these by-products are recognized as important feed resources. Their utilization is of mutual interest to livestock raisers and sugar-beet growers.

Sugar-beet tops harvested and siloed or stacked may be successfully used for fattening cattle or lambs, wintering pregnant ewes, or feeding dairy cattle when fed in mixed rations, they yield 150 to 250 pounds of beef or lamb per acre, two or three times as much as when tops are pastured.

Siloed beet pulp contains 76.4 per cent total digestible nutrients on a dry basis. The addition of molasses to the siloed pulp has been found to improve feeding efficiency.

These large food resources, if properly used, not only might promote an increased production of animal products, but also might increase the productive and economic stability of the beet-growing and sugar-manufacturing industries. Results of research on means of conserving and utilizing these sugar-beet by-products are presented in a new bulletin published by the College of Agriculture. (See page 4).

Research On Granulation Of Valencia Oranges Shows Only Limited Control Measures Exist

E. T. Bartholomew, W. B. Sinclair and F. M. Turrell

Granulation of Valencia oranges is not caused by a fungus, a virus, or a bacterium. It is definitely related to the growth activity of the tree and fruit.

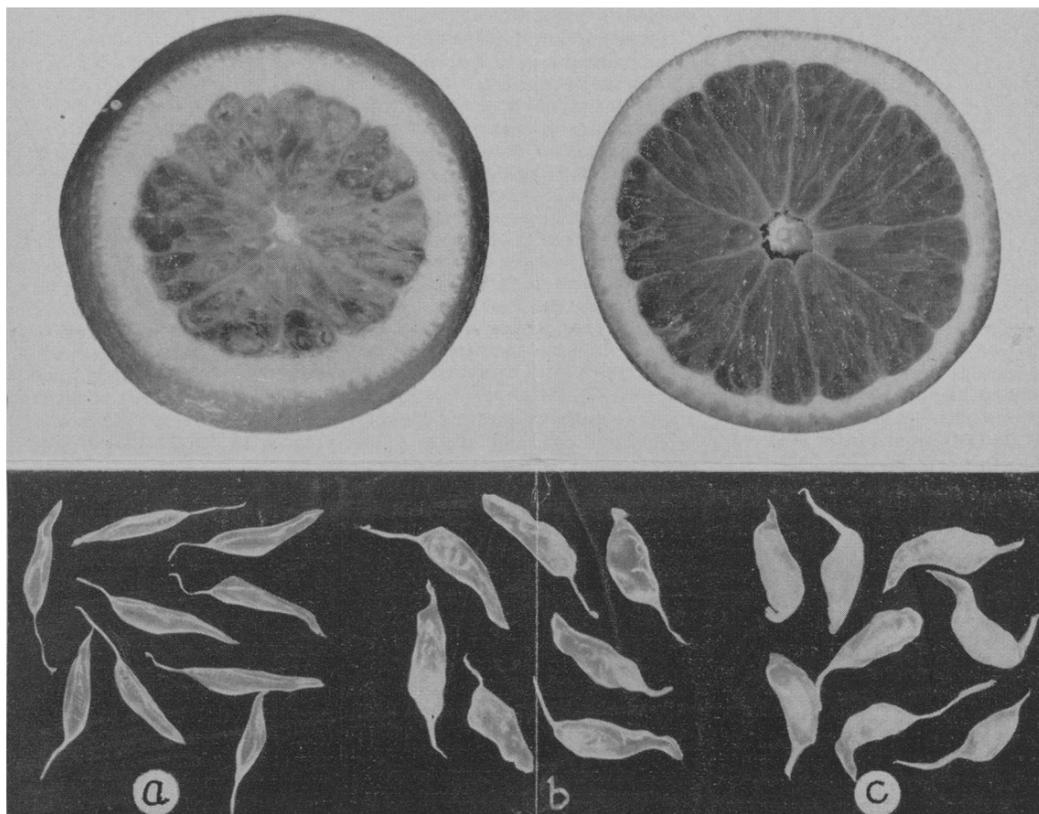
Since 1930 over 200,000 Valencia

Rough lemon rootstocks produced the most granulation—34% for the first, and 31% for each of the others—while Sampson tangelo produced the least—10%.

At Riverside a four-year average

In each case the percentage of granulation produced on the wet plots was a little over twice that produced on the dry plots.

Lime spray at 50 pounds per 100 gallons reduced the amount and sev-



Granulation in a Valencia orange. ABOVE LEFT: Granulation shown in a cross section of the stem end. ABOVE RIGHT: Cross section of the same fruit cut near the center, with no indication of granulation. BELOW: Showing (a) healthy juice sacs; (b) moderately granulated sacs; and (c) badly granulated sacs.

oranges—from approximately 2,000 trees in 75 groves—have been examined in studies to determine causes and possible means of control of granulation.

The cutting of a total of 61,900 fruits over a period of seven successive years showed the following percentages of fruits of different sizes to be granulated:

Fruit Sizes	Per cent granulated
100's	79
150's	54
200's	33
288's	18
344's	7

Over a period of nine successive years the cutting of 72,145 fruits showed 60 per cent to be slightly granulated, 25 per cent moderately so, and 14 per cent badly granulated.

Under these classifications slightly granulated fruits come within the tolerance limit set for high grade fruits. At least a large portion of the moderately granulated fruits can be shipped in an "off-brand," but badly granulated fruits have to be discarded or sent to the products plant.

Field Studies

Valencia orange trees were started on nine different rootstocks with buds from the same parent tree. Half of the trees were planted at Tustin, for the coastal area, and the other half were planted at Riverside, for the interior area.

At Tustin, a three-year average showed that the trees on Brazilian sour orange, trifoliolate orange, and

revealed that the trifoliolate orange and the Rough lemon were noticeably the two highest producers of granulation—37% and 24%, respectively—while C. E. S. 343 grapefruit produced the least—3%.

The average amount of granulation produced by all rootstocks was 26% at Tustin and 14% at Riverside. The percentages given here are relatively high because only large fruits were examined.

Some trees in a given grove constantly produce little granulation, others produce much granulation, while still others may produce little granulation one year and much the next.

Fruits on the north side of the tree are more likely to be granulated than those on the south side.

Freezing temperatures may cause an increase in the amount of granulation in some individual fruits but low temperatures are not the direct cause of granulation.

Scaly bark does not cause granulation. A scaly-bark tree that produces much granulation does so because it had done so previously.

Over a period of years the soil in certain "dry" plots was kept just above the wilting point in the fourth foot while adjacent "wet" plots were kept above the wilting point in the first foot.

After a time the water applications were reversed, the dry plots became wet plots and the wet plots became the dry plots.

erity of granulation about half. This treatment is not recommended because the treated trees lost excessive amounts of leaves during the fall winds.

During a period of seven years, oil sprays were found to augment the amount and severity of granulation. Their use should be avoided where possible.

HCN—hydrogen cyanide—tested at the same time, did not affect the production of granulation.

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Poultrymen May Have More Market Competition Ahead

E. C. Voorhies

California does not produce enough eggs to keep up with the demand.

We must ship in eggs from other states. This puts the local producer in a favorable position because he gets a better price, and the consumer gets better eggs. The top quality ones are no longer shipped to eastern markets. Our in-shippments, on the other hand, do not come only from the Western states, as formerly, but in increasing numbers from those farther east, mainly the Mississippi Valley.

People have now developed a taste for good eggs. This taste was encouraged by wartime emphasis on eggs as a protective food, plus the fact that meats were rationed and were relatively higher in price. The buyer still wants, and has the money to buy, good eggs. It is up to the poultryman to see that he gets them.

If the producer keeps the quality up, people will continue to eat more eggs. If quality drops, consumption and prices will go down.

Changed Market Conditions

If domestic consumption is lowered, the poultryman cannot count on foreign exports to take up the surplus. Europe, the chief wartime market, cannot afford to import eggs now, and we no longer have lend-lease and large military demands for them. During the war, large quantities of eggs were dried for overseas shipment. Dried egg production, largely carried on in the middle west, has now taken a big drop, which means more midwestern eggs for domestic markets. Good quality, continued good advertising, and good prices as compared to meat can help keep the demand for eggs at a high level.

Over a period of years, the number of shell eggs being held in storage has been going down. This is an advantage for the producer during the fall and winter months because his fresh shell eggs do not compete directly with the cold storage ones.

California now does not have a corner on new production methods. At one time, the state could send out eggs between October and February—the period of low production in other sections of the country. But poultrymen in other states, especially our chief competitors in the Mississippi Valley, have also developed improved management practices so that they do not have such big gaps between laying periods. This means that there is less difference between the year's highest and lowest egg prices. This

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Ladybirds, Lacewings, Parasites Tested As Long-tailed Mealybug Controls In California Citrus

Paul DeBach and C. A. Fleschner

The long-tailed mealybug, *Pseudococcus longispinus*, is a relatively recent pest of citrus and occurs principally in coastal areas of Orange, Los Angeles, and Ventura counties.

The first minor outbreak of the long-tailed mealybug was found on citrus in 1933 in the Rivera-Downey section of Los Angeles County. Parasites were introduced to combat this pest and it was generally thought they were keeping the mealybug in check.

In 1943 another build-up of the long-tailed mealybug occurred on citrus; this time in the Anaheim area of Orange County. This infestation

increased in area in 1944 and 1945 until perhaps 1,000 acres were infested to a greater or less economic degree.

Coastal areas of Ventura County were experiencing similar increases in long-tailed mealybug populations on citrus during this same period.

Studies Started

Studies started late in 1945 were designed to determine why the mealybug was increasing.

During 1946 and 1947 detailed population samples of the long-tailed mealybug and all its natural enemies have been taken monthly. At the

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Value Of Poultry Improvement Plans To Producers And Buyers Of Chicks, Poult, Eggs Defined

A. S. Rosenwald

"Caveat emptor, let the buyer beware," is an old adage which no longer need challenge poultrymen buying chicks, poult, or hatching eggs.

The participants in the National Poultry Improvement Plan and National Turkey Improvement Plan have voluntarily secured disinterested supervision for the protection of purchasers of chicks or poult. This supervision, based as it is on much research and experience, is assurance that the source breeding birds meet specific minimum requirements. Terms like "Chicks from U.S. Pullorum Clean Stock," "U.S. Pullorum Controlled Chicks," "California U.S. Approved Pullorum Clean Poult," etc., have definite meanings which must be understood to be of value to prospective buyers of baby chicks and poult.

LABELS TO PROTECT POULTRYMEN

Class	Safety	Testing Tolerance
U. S. Pullorum Clean	Excellent	No infection. Turkeys and chickens.
U. S. Pullorum Passed	Very good	No infection at last test. Turkeys and chickens.
U. S. Pullorum Controlled	Good	In California less than 1% infection. Chickens only.
U. S. Pullorum Tested	Questionable	Not recognized for turkeys. Less than 4% infection. Not recommended. Not recognized in California.

The National Poultry and Turkey Improvement Plans are projects sponsored by the United States Bureau of Animal Industry. In cooperation with official state agencies they maintain supervision of plans for pullorum disease control and eradication, and for breeding improvement. While details vary, the standards for the different classifications in all states under the plans must meet the same minimum requirements. Each state cooperating in either of the National Plans has an official state agency. In California the Poultry Improvement Advisory Board and the Turkey Breeding Advisory Board are the official state agencies operating under the authority of the Director of Agriculture by virtue of the California Marketing Act, through marketing agreements between the Director of Agriculture and the participating chicken and turkey producers. These boards are independent agencies, composed of members of the industry which they serve. They employ a competent staff to aid in the administration of the plans.

Scope Of The Plans

Now, just exactly what do these plans mean to prospective purchasers of baby chicks or poult? At the present time the California Poultry Improvement Plan concerns itself only with the supervision of official pullorum disease control and eradication for both chickens and turkeys. In chickens there are three classes in the California pullorum disease program; while in turkeys only the higher classifications are recognized. Effective in the fall of 1947, a Turkey Breeding Improvement Plan was initiated to assist in the verification of the quality of the turkey breeding stock used.

Labels Are Buyer Insurance

The signatories to these Plans have, in all likelihood, operated under self-imposed limitations or standards for much longer than either of the Plans has been in operation. Participation in either Plan means that the official state agency verifies the fact that certain practices are being followed. It provides assurance to the buyer that birds bought under the Plan will meet certain minimum specifications as labeled.

Though participation in the Plan sets certain minimum requirements, it does not set a ceiling on improvement above that level. Breeders who operate outside the California Poultry or Turkey Improvement Plans may have disease control or breeding programs of equal or greater merit. However, no third party verifies minimum qualifications nor supervises their work.

Official Disease Control

At the present time the California Poultry Improvement Plan is concerned only with pullorum disease, a bacterial infection caused by *Salmo-*

nella pullorum, and for which efficient blood tests have been developed. Properly used as an integral part of a program, these tests can effectively curtail or eliminate this disease from a flock of adult birds. Obviously, all infected birds detected by the test must be removed from the flocks as soon as practicable and before any hatching eggs are saved from that flock. If the testing, removal of infected birds, and other details of the disease control program are properly done, prospective buyers can be more certain that pullorum disease, which is carried through some of the eggs from infected birds, will not cause early mortality in a brood of chicks or poult. The California U.S. Poultry Improvement Plan supervision assures correct procedures.

Top Pullorum Grade and Label

The top grade recognized under

the Plan, for both turkeys and chickens, is U.S. Pullorum Clean. The stock used to produce the chicks, poult, or eggs passed official blood tests and no infected birds were found. Two official negative tests are required for chickens. All eggs hatched at "U.S. Pullorum Clean" hatcheries must meet identical standards. Containers of this grade of chicks, poult, or eggs have the official label with the words "California U.S. Pullorum Clean" printed in blue.

Other Turkey and Chicken Grade

The next class in U.S. Pullorum Passed, also recognized for both turkeys and chickens. Eggs or day-old birds in this grade came from stock which had passed one test at which no infection was found. Previous tests might have indicated some infected birds, which were removed from the flock. No less than 21 days, nor more than 6 weeks later another test was run that showed no infection. The label for this class is printed in red and has the words "California U.S. Pullorum Passed."

Other Pullorum Classes — Chickens Only

For chickens only there is one additional class recognized that of California U.S. Pullorum Controlled. In California this classification means that the eggs or chicks came from breeding stock which had no more than 1% infection with pullorum disease at the last test. In many states U.S. Pullorum Controlled means that not more than 2% of the birds in the flock were infected. The label "California U.S. Pullorum Controlled," printed in black, designates this class.

Danger From U.S. Pullorum Tested Class

In some states an additional, lower classification, U. S. Pullorum Tested, is recognized. At the present time this means that not more than 4% of the birds from which the young stock originated were infected with pullorum disease at the last test. The California Poultry Improvement Plan does not recognize this class, "U.S. Pullorum Tested," because it was felt that it permitted the use of breeders which were almost certain to have pullorum infection. Thus the purchaser must expect mortality from this disease.

Only participants in the official program may use the official labels in their advertising or on their boxes, and they may use only the label to which the classification entitles them.

Turkey Breeding Plan

Under the California Turkey Breeding Improvement Plan the hereditary qualities of the breeder-turkeys must come up to certain minimum specifications. Selection is supervised by the Turkey Breeding Advisory Board, the official state

Market Adjustment May Face State's Prune Industry

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packed in 25 pound boxes were sold by packers at an average of about 4c a pound f.o.b. California, and by New York wholesalers at close to 5c. California prune crops generally average between 60 and 65 prunes to the pound on a natural weight basis. They gain between 3% and 4% in weight from the water absorbed in processing.

Packers' prices for processed French prunes f.o.b. California shipping points packed in 12 pound boxes during 1934-1938 averaged about 4c a pound for 50/60's which are packed about 59 to the pound. In the face of the very strong demand for food, the f.o.b. prices of 50/60's were held to about 9½c during the war by price ceilings and by government subsidies of about 3c a pound to consumers. With the removal of price ceilings and subsidies, f.o.b. prices for 1946 pack rose to about 16½c for 50/60's and held near this level until about April, 1947. Then under the pressure of slow trade movement and large stocks, prices began to drop sharply until f.o.b. sales were down to about 13c for 50/60's in July. Prices continued to fall and the new 1947 pack was quoted generally at about 11½c for 50/60's during October and early November.

United States retail prices of dried prunes averaged close to 10c a pound during 1934-1938 and about 17c during 1942-1945 under price ceilings and a subsidy of about 3c a pound. The price ceiling and the subsidy were removed from the 1946 crop and at the same time farm prices rose greatly. As a result, retail prices for the 1946 crop rose to a record season's average of about 25c a pound. They reached a peak of about 26c in the spring of 1947 and had declined very little by August. It usually takes a few months after f.o.b. prices fall substantially in California before retail prices fall in the East.

Foreign Competition Uncertain

With normal weather conditions and the better peacetime care that may be expected in the war-damaged orchards of Europe, total foreign production of dried prunes during the next few years may exceed the wartime average of about 25,000 tons, but will probably still be below the prewar level of about 50,000 tons. Whether European production of dried prunes during the next 10 or 15 years will rise to, or above the prewar level seems almost impossible to guess, largely because of the great changes in political and economic conditions that have taken place and that may occur in the future in European prune producing and importing countries, particularly in Germany and in those countries under Soviet domination.

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agency for this Plan in California. The four classifications under this plan are: California U.S. Approved, California U.S. Certified, California U.S. Record of Performance (R.O.P.), and California U.S. Register of Merit (R.O.M.).

CALIFORNIA TURKEY BREEDING IMPROVEMENT PLAN STAGES

Stage	Breeding Quality	Requirements
California U.S. R.O.M.	Superior	Progeny and performance tests plus conformation.
California U.S. R.O.P.	Excellent	Performance tests and conformation.
California U.S. Certified	Very good	Superior toms plus conformation.
California U.S. Approved	Good	Conformation.

At present, the U.S. Approved stage is the one which will probably be used by most California turkey breeders. The turkeys must be selected for normal conformation, posture and gait, and be free of abnormalities. An official inspector must approve the flocks and must "handle" at least 10 per cent of the breeding birds. The California U.S. Certified flocks fulfill these requirements but in addition the hens are mated to superior toms from one of the two higher breeding stages. The California U.S. R.O.P. and R.O.M. stages are still higher and embrace records, made

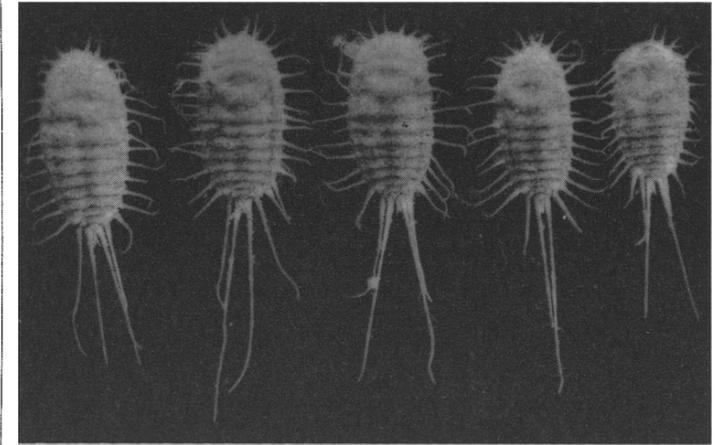
Ladybirds, Lacewings, Parasites, Tested As Long-tailed Mealybug Controls In California Citrus

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same time preliminary tests have been conducted to determine the effect of various insecticidal materials on the natural enemies of the long-tailed mealybugs. Although these studies are not yet complete, certain of the results may be of interest now.

In addition to these local investigations, the University's Division of Biological Control has sent a scientist to South Africa to search for natural enemies of pests of California agriculture. Part of his task is to obtain parasites or predators of the long-tailed mealybug.

Thus far, aside from natural enemies of other pests, one mealybug predator species and one parasite species new to California have been received and are being reared and tested in the insectary.



The long-tailed mealybug—*PSEUDOCOCCUS LONGISPINUS*—a relatively recent pest of citrus. Insect enemies of the long-tailed mealybug are being studied as possible controls.

As numbers increase they will be liberated in the field in mealybug infestations.

Parasites and Predators Identified

The work during 1946 demonstrated that several natural enemies in addition to the parasites introduced in the 1930's, were killing the long-tailed mealybugs. Six species of primary parasites and seven species of predators were reared.

Among the parasites, *Anarhopus sidneyensis*, was by far the most common, comprising 85% of those recovered. *Tetraneura pretiosus* comprised 9%; *Coccophagus gurneyi* 4%; and *Tetraneura peregrinus* 1%.

Among the predators the California brown lacewing, *Symphorobius californicus* — was the most common, comprising 74% of those recovered; whereas the Australian ladybird beetle — *Cryptolaemus* — comprised 16%, and the California green lacewing *Chrysopa californica*—10%.

Based on an average for 10 citrus groves, records graphically portray the changes which occurred in the long-tailed mealybug and its predator and parasite populations during 1946.

Records show that the long-tailed mealybug started to build up rapidly in early spring. Natural enemies started to increase soon thereafter and, in general, effectively stopped

under official supervision, indicative of certain minimum performance in egg production, egg weight, hatchability, and body weight. The R.O.M. class in addition includes progeny test records of viability and market quality. Turkey breeders working in

the long-tailed mealybug outbreak by May and drastically reduced it by June.

The increase was not checked until mealybugs had reached economic proportions in certain groves.

In all groves studied, long-tailed mealybugs were reduced to low levels by June or July. They remained low until the following spring.

Field observations indicated that predators, not parasites, were primarily responsible for this control.

Careful analysis of data from the population censuses, as well as experimental tests, confirmed these observations. The predators showed the ability to increase in numbers and overtake the mealybug populations as was shown by the relative change in their proportions from March and

April to May, June and July. The parasites did not show this ability.

When predators were excluded from trees by treatment with DDT, which did not exclude the principal long-tailed mealybug parasites, it was evident that the parasites, although beneficial, were not nearly as effective as were the predators on trees not treated with DDT.

In the spring of 1947 long-tailed mealybug populations again started their annual upward trend. For some reason, however, the most common and efficient natural enemy of 1946, the California brown lacewing, did not appear in numbers as early as it had previously.

Parasites, as in 1946, apparently were not an efficient regulatory factor. The other common predators, Australian ladybird beetle and California green lacewing were not able to overtake the mealybug as early as the brown lacewing had done the year before.

As a result, long-tailed mealybug population increases in general were not checked as soon or as effectively as in 1946. General reductions occurred principally in July in 1947.

The green lacewing appeared to be about as effective as the brown lacewing in the final subjugation of the long-tailed mealybug in 1947, although the Australian ladybird beetle also became common in certain groves.

Effect of Insecticides

Preliminary studies on the effect of various insecticides on predators and parasites of the long-tailed mealybug indicate that most residues, even certain ones such as talc, not possessing toxic properties, can slow or even stop the increase of predators for an appreciable period of time. DDT is especially toxic and long-acting in its adverse effects on predators but it had no apparent effect on the principal parasite of the long-tailed mealybug.

Studies to Continue

Studies projected for 1948 are designed to test the relative effects of mass liberations of both larvae and adults of the California brown lacewing, the Australian ladybird beetle and the California green lacewing. The Orange County Department of Agriculture will cooperate in this work.

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Further details about the Improvement Plans are available from local Farm Advisors, or the Poultry Improvement Advisory Board, 1030 Forum Building, Sacramento 14, California.

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