

The State Plant Quarantine Service and the California Avocado Grower

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Agriculture still remains the basic industry of this state. In spite of a year of extremely low prices the value of the fruit, vegetable and field crops in California in 1931 was \$317,374,000. Life itself is dependent upon agriculture. It is therefore obvious that the protection of life through preventing the introduction and spread of pests affecting agricultural production is one of the most important functions of government. Like taxes, and just as sure, the damage caused by insect and plant disease depredators must be faced every year by the farmer. These pests not only lessen yield, but reduce the grade. Millions of dollars are annually spent in this country in control of agricultural pests and further millions are lost through injury caused by them. In this age of over-production or under-consumption only perfect or top grade agricultural products can be marketed. Fruits or vegetables showing insect presence or injury, or wilt, scab or other evidence of disease must be discarded in favor of those products free from defects even though such defects do not seriously affect the edibility of the product, but merely mar its appearance.

California has widely advertised her wonderful climate and vast resources. These factors which make our state so attractive to tourists and visitors present a favorable environment for the establishment of practically any insect or plant disease pest occurring in other states or foreign countries.



Fort Yuma Quarantine Station.

It might appear to the California farmer and fruit grower that he now has more than his share of insects and plant diseases to combat by spraying, fumigating or dusting, but a little investigation will disclose that he is as yet relatively free from most of the more injurious pests occurring in other sections of the world. Our pioneers in agriculture early recognized the importance of preventing the introduction into this state of injurious agricultural pests and California was the first state to enforce quarantine measures for that purpose. The first plant quarantine law passed was issued by the State of California just fifty years ago, some thirty years before Congress recognized the importance of authorizing federal activity in that regard. Enforcement of plant quarantine measures has since been continuous in this state. It is true that this activity by the state has called for the expenditure of public funds and that this expenditure has increased as new avenues of pest spread have appeared and it became necessary to close them. However, the cost of either eradicating or continuously controlling any one of the serious insect or disease pests not now established in California and constantly threatening to enter, such as the Mediterranean fruit fly, Oriental fruit moth, or pink bollworm of cotton would more than offset the expense of all quarantine enforcement in the past fifty years.

The spread of insects and plant diseases through natural means, such as flying, crawling, hopping, carriage on the bodies of other insects or animals and by wind and moving streams, is largely beyond the control of man. California has the fortunate condition of being protected on her borders from this natural spread by reason of the barren desert and mountain conditions which surround us. It is practically impossible for any insect or disease pest to enter our state by natural flight over these barriers along our borders. They must be brought in by man through travel or commerce and it is against this method of spread that plant quarantine is directed. With the very

remarkable improvements made in transportation methods the problem of plant quarantine enforcement has yearly become more complicated. The construction of new highways and advancement in automobile construction have resulted in the passenger automobile and truck becoming an important factor. It is now possible for the average individual to travel in his automobile across our continent within a few days. To meet this situation California has established quarantine inspection stations on all of the highways entering the state where all automobiles, trucks and other vehicles entering the state are stopped and inspected. Experience has shown that motorists have a propensity for collecting and transporting plants or portions of plants which appear unusual to them or for food purposes. The interception at these border stations during 1931 of 19,389 lots of contraband plant material and 2,501 lots of live insect pests, including the Oriental fruit moth, cotton boll weevil, Colorado potato beetle, cherry fruit fly, etc., all of serious agricultural consequence and none of which occur in this state, demonstrates the value of this effort. This type of inspection has been most difficult. Citizens naturally resent any official activity which calls for an examination of their intimate personal belongings. While our observation has indicated that there is no class of society that is exempt from transporting contraband plants and fruits, unfortunately we do find, that the prosperous sightseer and visitor to this state is more apt to carry plants and fruits than the poor traveler with limited funds and possibly seeking employment. Through misunderstanding or oversight this contraband is frequently found in the possession of these entirely reliable and responsible citizens contrary to their definite assurance otherwise and it is only through careful inspection that it is intercepted. In recognition of the embarrassment and inconvenience that this type of inspection causes, every effort is made to operate this automobile inspection service on a courteous and friendly basis. We solicit at all times the friendly cooperation of the traveler and ask for his indulgence.

In recent years another type of transportation, in its reference to plant quarantine enforcement, has assumed importance—that is air travel. The inspection of airplanes is now an active feature of plant quarantine enforcement. Fortunately, up to this time, the use of airplanes in transcontinental travel has been largely confined to regular companies operating planes on schedule, and through education it has been possible to secure the cooperation of operators of these planes so that the pest menace presented through that method of transportation has so far been adequately met.

Plant quarantine protection extends to the examination of all plants and plant products and other articles which might carry pests entering this state by railroad freight, express and parcel post mail. This phase of plant quarantine enforcement is carried on by the County Agricultural Commissioners and their inspectors acting as State Quarantine Guardians. Probably the most important branch of the plant quarantine enforcement work is that connected with the examination of ships and their cargoes from foreign countries. At all of the maritime ports of entry in California an efficient and adequate force of inspectors is maintained by the State of California, these inspectors acting as collaborators and quarantine enforcement officers of the U. S. Department of Agriculture. Every vessel entering California ports from foreign countries or other states is inspected. A search is made of the crew and passenger quarters, ship's stores, and inspection is made of any plant products or other restrictive material carried as cargo or in passengers' baggage.

It is interesting to note that but few of the more serious insect and disease pests now occurring in the United States are native. Most of them have been introduced from foreign countries. It is important to know that most of these introduced pests from foreign countries have not become established in California although they have been repeatedly intercepted and rejected in quarantine at the California ports of entry.

The avocado industry in California should be particularly interested in efficient plant quarantine enforcement. The avocado grower in this state may believe that he now has about all of the scale insects to contend with that attack the avocado and that there are no other avocado pests of serious consequence. However, there are reported in foreign countries fourteen different species of scale insects attacking the avocado, none of which are now known to occur in California. These scale insects bear such formidable scientific names as **Aspidiotus articulatus**, **Aspidiotus perseae**, **Aspidiotus persearum**, **Aspidiotus personatus**, **Aspidiotus scutiformis**, **Lepidosaphes longula**, **Pinnaspis rhombica**, **Pseudoparlatoria parlatorioides**, **Ceroplastes cistudiformis**, **Ceroplastes rubens**, **Icerya montserratensis**, **Pseudococcus virgatus**, **Pulvinaria mammeae** and **Pulvinaria simulans**. Most of these scale insects occur in Mexico. A number of them also occur in the West Indies, Central American countries, Java, Brazil, India, Ceylon, Isle of Pines, Puerto Rico and Hawaii.

In addition to scale insects there are a number of other serious pests. Unquestionably, the outstanding and most feared insect in the world today is the Mediterranean fruit fly. This insect attacks a wide range of fruits, including the avocado. It is established on every continent except that of North America and its occurrence in the Hawaiian Islands presents a most serious situation to California. Live larva of this insect are being frequently intercepted at California ports in fruits brought by passengers and crew on vessels from Hawaii. There is a very strictly enforced federal quarantine embargo against all fruits and vegetables from the Hawaiian Islands that will transport this pest, and a most careful search is made of every vessel from Hawaii and of every piece of baggage, including parcel post packages, in order to intercept such fruits destined to the mainland. This insect in the adult stage is a small fly with brightly colored wings. It lays its eggs within the fruit. These eggs hatch into maggots which squirm about in the fruit and feed upon the pulp.

Other pests of vital importance to the avocado industry are the several species of avocado weevil, **Heilipus** sp., now occurring in Panama, Mexico and Central American countries. The adults of these species deposit eggs in the fruit just under the skin. After hatching the larvae wander through the pulp before entering the seed, thus rendering a considerable part of the fruit inedible. The adults feed upon the half-ripe fruit, young leaves, stems and seed. In feeding upon the fruit, holes one-half inch deep are eaten out by the adult. One species of this weevil is the subject of a federal quarantine which embargoes all avocado fruits and seeds from Mexico and Central America.

In addition there is a moth known as **Suana concolor** occurring in Java, which is a serious defoliator of the avocado. Another moth, known as **Zeuzera coffeae**, in its larval stage bores into the wood of the avocado and does serious damage. This moth occurs in India, Ceylon, Java and East Africa. There is another borer, a weevil, known as **Apate monachus**, reported from Africa and the West Indies which also does serious injury to the avocado trees. Another beetle, known as **Diaprepes abbreviatus**, is to be

found in the West Indies and in its larval stage does serious injury to the roots and in the adult stage to the foliage of the avocado.

It is thus apparent that the avocado grower in this state is still relatively free from the more serious insect pests attacking that crop. These conditions seemingly justify the active interest and support of the avocado industry in the proper maintenance of an adequate and efficient protective quarantine service in California.



Redwood Highway Quarantine Station.