

REPORT OF THE CHIEF OF THE BUREAU OF PLANT
QUARANTINE, 1933

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT QUARANTINE,
Washington, D.C., August 26, 1933.

SIR: I transmit herewith a report of the work of the Bureau of
Plant Quarantine for the fiscal year ended June 30, 1933.

Respectfully,

LEE A. STRONG, *Chief of Bureau.*

HON. HENRY A. WALLACE,
Secretary of Agriculture.

INTRODUCTION

The revocation of two domestic plant quarantines, progress in the suppression of the pink bollworm in the United States, and the inauguration of a vigorous attack on a newly discovered gypsy-moth outbreak in Pennsylvania have been among the more important developments in plant-quarantine work during the fiscal year 1933.

The regulations that were canceled were those relating to the European corn borer and to the phony peach disease. The revocation of the corn-borer quarantine was made necessary by the lack of available funds for its adequate enforcement. In the case of the phony peach disease, on the other hand, the discovery that the disease occurred extensively in large peach-growing areas in a considerable number of States made it appear that further work in the direction of preventing the spread of this disease could be carried out more satisfactorily through the nursery-inspection organizations of the various States rather than under the provisions of a Federal quarantine. In the case of both the European corn borer and the phony peach disease projects, the Bureau is continuing to aid in prevention of spread by cooperating with the States in the inspection and certification of susceptible materials.

The Pennsylvania outbreak of the gypsy moth, which was found in the late summer of 1932, is the most extensive infestation of this pest that has ever been discovered in this country west of the New England States, with the exception of the one in New Jersey discovered in July 1920. The State and Federal Governments are cooperating in the effort to suppress the outbreak.

During the year the port inspection service made more than 20,000 interceptions of insects and plant diseases in shipments coming from foreign countries, including many serious pests of fruit, cotton, rice, beans, potatoes, forest trees, and other plants and crops of economic importance.

The progress of these lines of work, as well as the Bureau's activities in suppressing or preventing the spread of the Mexican fruit fly, the Japanese beetle, the pink bollworm of cotton, the *Thurberia* weevil, the *Parlatoria* scale on date palms, the brown-tail and satin moths, narcissus pests, the white pine blister rust, the black stem rust of grains, and the Woodgate rust, and preventing the introduction of foreign insect pests and plant diseases, are presented in detail in the following pages.

DOMESTIC PLANT QUARANTINES

GYPSY MOTH AND BROWN-TAIL MOTH

GYPSY MOTH FOUND IN PENNSYLVANIA

An infestation of the gypsy moth (*Porthetria dispar* L.) was discovered at Inker-mann, near Pittston, Pa., late in July 1932. No special Federal or State funds were available to carry on clean-up work, but in the emergency the State made

arrangements to provide headquarters and storage, also to pay some miscellaneous items, and Federal funds, totaling \$78,000, were drawn from the barrier-zone project to carry on the needed scouting and extermination activities.

A rapid survey made by four Federal experts in the fall of 1932 indicated that the heavily infested area included the city of Pittston, and extended north, east, and south. By the end of September, 48 additional men had been withdrawn from New England, and they continued work in Pennsylvania until early in November. Small infested centers were found in all directions, but there were fewer toward the west. This rough survey indicated that about 15 square miles could be considered heavily infested and that 95 square miles contained small local infestations. A surrounding area of an average width of about 3 miles was scouted roughly, particularly along the roads, to determine in a general way the limits of the area infested.

Later, the banks of the Susquehanna River to flood mark were scouted from Ransom to Nanticoke, and the Lackawanna River from its mouth to beyond the northern limits of the city of Scranton. This resulted in locating a number of dangerous infestations which were immediately treated. In addition to this, the area scouted embraced the entire cities of Scranton and Pittston and many small towns and villages, as well as the northern part of the city of Wilkes-Barre.

The funds available were not sufficient to determine the limits of infestation as it was necessary to concentrate most of the work in the heavily infested central district. The area so far found to be infested is 230 square miles.

The most urgent need was to reduce the infestation materially, particularly in the badly infested central area, before the larvae hatched in late April or early May, in order to prevent spread, and to do as much scouting and treatment as possible in the outlying areas.

The work has been carried on in cooperation with the State department of agriculture and the department of forests and waters. The Federal force supervised the work, furnished as many experts as possible, and supplied such spraying equipment, tools, insecticides, etc., as the funds available would permit. The State department of agriculture furnished labor and part of the supplies and also leased a building for office storage and headquarters for transport and spraying equipment in the city of Wilkes-Barre. An arrangement was made between the State department of agriculture and the State relief department to set up a fund of \$100,000 to furnish work to the unemployed in the infested area. This arrangement was approved by the Governor, the funds were allotted equally to the relief boards of Luzerne and Lackawanna Counties, and a schedule set up so that men would be furnished regularly from the welfare lists.

Beginning January 16, 1933, and extending to June 30, the time was staggered so that each man who did satisfactory work would be employed for about 4 weeks. In all, nearly 1,000 men received work, an average of about 200 being employed throughout the period. They were engaged in cutting and burning worthless trees and brush in the badly infested areas. This work was closely supervised by Federal men detailed from the barrier-zone work, and gradually men from this welfare group were selected and trained to find and treat egg clusters, to climb trees, and to assist in spraying.

Since January 1933 there have been treated or destroyed over 1,850,000 gypsy-moth egg clusters, most of these being in the central infested area. An egg cluster contains an average of 400 eggs. Over 1,200 acres of wood and brush land were cut and the slash burned.

Spraying with arsenate of lead was begun in June and was not completed until July 7, 1933. Most of the 26 high-power spraying machines operated were used for treating small lots in cities and towns, and special care was necessary in order to prevent defacement of buildings and fences, and automobiles or other vehicles that were moving where the spray was being applied. Over 4,800 of such properties were treated in residential sections, and over 2,800 acres of woodland were also sprayed. In some of the latter areas conditions were such that the handling of hose lines was extremely difficult, and in one case 7,000 feet of hose had to be used in a single line in applying treatment.

There are only a few small nurseries in the infested area, and they do a local business. It was found, however, that there was some movement of native plants such as rhododendrons and laurel, and that some forest products and surface stones were moved out of the territory. It seemed necessary to safeguard the movement of such material in order to protect adjoining sections as well as other States, and that the movement of freight cars, particularly those stored on sidings which were bordered by infested trees, should be given attention. Accordingly a State quarantine covering the townships of Bear Creek, Exeter, Hanover, Jackson, Jenkins, Kingston, Plains, Plymouth, Pittston, Wilkes-Barre, and the

boroughs or other political subdivisions within or bounded by these townships or cities in Luzerne County, and the townships of Lackawanna, Ransom, Dunmore, Spring Brook, Jefferson, Roaring Spring, and Scranton, the city of Scranton, and any boroughs or political subdivisions within or bounded by these townships or cities in Lackawanna County, was announced March 15, 1933. Inspection of materials likely to carry infestation is required.

The principal materials inspected thus far have been props and lagging used in the mines, 6,721 units of this material having been inspected and certified up to the close of the fiscal year.

The results obtained in Pennsylvania have been most satisfactory considering the unusual difficulties which arose as a result of this emergency work. Although the area was scouted substantially as planned, the extreme limits of the infestation have not been determined up to the present time. A study of weather records which have been secured from the Scranton, Pa., station of the United States Weather Bureau covering the past 10 years, indicates that the trend of spread based on favorable wind and temperature conditions at the time when the wind spread of small larvae was possible, ranged from north to southeast from the central infested area. Unfavorable conditions for spread during this period in the sector northwest to south of the center was indicated. The actual spread that has been determined thus far has been principally in the directions indicated as favorable, but sufficient work has not been done to determine the outside limits of infestation. Intensive work is necessary on this project as this infestation is one of the largest and most difficult to handle that has been found outside New England.

CONDITION OF THE INFESTED AREAS IN NEW ENGLAND

Defoliation by the gypsy moth was more extensive during the summer of 1932 than during the previous year, the total area amounting to over 286,395 acres. The forests which were most completely stripped were those located south of Boston, in southeastern Maine, and in New Hampshire north and east of Lake Winnepesaukee. White pine suffered severely, particularly many of the smaller trees in Massachusetts, and the growth of deciduous trees was greatly retarded as is now shown by the subnormal length of twigs and branches.

Records received from owners of cranberry bogs in the territory south of Boston and on Cape Cod indicate a loss of 2,780 barrels of fruit for the year, and as severe defoliation injures the growth so as to prevent fruiting the following year, the entire loss for the 2 years will approximate \$55,600.

BARRIER-ZONE PROJECT IN NEW ENGLAND AND NEW YORK

At the beginning of the fiscal year severe reduction in expenditures was made necessary by a 38 percent cut in the funds available for the gypsy-moth project. On this account it was necessary to curtail purchases of supplies and equipment to the minimum, and in addition to dismissing more than 90 regular salaried employees, it was necessary to furlough 69 others for 1 month in order to keep within the funds available.

Woodland scouting in the barrier zone, except in the area where the most infestations have been found, was abandoned; and during the latter part of July, on account of the finding of the serious infestation in northeastern Pennsylvania, the work in the barrier zone was further reduced by the diversion of \$78,000 to provide for this unforeseen emergency.

As a result of such limited work as could be done in the barrier zone, 30 infestations were found—17 in towns in southwestern Massachusetts and 13 in northwestern Connecticut. Twenty-four of these were severe enough to require extensive spraying, and more than 1,900 acres were treated in this way during the month of June 1933. Weather conditions were excellent for spraying, and effective results have been secured in the areas treated.

In the New York section of the barrier zone extensive scouting has been done by the conservation department of that State. Two infestations were located, one at Dover and another at Milan. These were treated and thoroughly sprayed.

In recent years, particularly in the spring of 1929 and 1930, rather conclusive evidence was secured that weather conditions were favorable for wind spread of the smaller caterpillars from territory east of the barrier zone to the section of the zone in southwestern Massachusetts and northwestern Connecticut. It is, therefore, of primary importance that more extensive work be done in this section of the zone, and that the woodland areas that have never been examined in Vermont and Connecticut be inspected at the earliest possible date.

Collections of over 400,000 female gypsy moth pupæ were secured near Middleboro, Mass., and from them over 166,000 females emerged. The tips of the abdomens of these insects were placed in a solvent and used in small cages for the purpose of attracting male moths. Two hundred and fifty moths were caught at 105 cages during the season, and some of these catches gave important clues as to the location of new infestations.

GYPSY MOTH WORK ON LONG ISLAND

The New York Conservation Department scouted selected areas in Queens County, North Hempstead and Oyster Bay towns in Nassau County, and Smithtown and Brook Haven towns in Suffolk County, Long Island. No infestation was found in Queens and Suffolk Counties. Twenty-three infestations were located in Nassau County, 13 of them being found in North Hempstead and 10 in Oyster Bay town. All these infestations were found in an area of approximately 2 miles in radius from North Roslyn. This area has been for several years under State quarantine, and all shipments proceeding from it are inspected and certified by Federal inspectors. During the year over 4,000 shipments, including nursery stock, forest products, etc., have been so certified. Two small infestations in Oyster Bay town were found about a mile north of this area. One of them was in a lumber yard and the other not far from a nursery establishment. Both of these locations have been placed under quarantine and in addition to the clean-up work that has been carried on in all the infestations mentioned, inspection and certification of products that are being moved has been required.

THE GYPSY MOTH IN NEW JERSEY

On February 6, 1933, a gypsy-moth egg cluster was found in the township of Randolph, N.J., near the Mendham-Randolph-Morris township lines. This is in the northernmost part of the area that had previously been found infested. Further scouting during the late winter and early spring resulted in the finding of 111 new egg clusters. These were treated, and arrangements were made to carry on spraying work in June. The location where these egg clusters were found was particularly difficult to examine carefully on account of the large number of ledges and boulders which cover most of the ground area and furnish convenient hiding places for the moths to oviposit. Owing to shortage of State funds and the need for prompt action, an arrangement was made whereby the Bureau furnished a supply of tanglefoot and arsenate of lead, together with a fully equipped high-power sprayer, for treating this infestation. The work was supervised and the labor supplied by the State department of agriculture. Sixty acres of woodland in and surrounding the infestation were thoroughly treated during the first half of June 1933.

On July 1, 1932, Federal work on the gypsy moth had been discontinued in New Jersey, but the State department of agriculture continued a limited amount of scouting and check-up work throughout the year. This project was supervised by a Federal expert who had been in charge of the work in New Jersey for many years and who was transferred to the State work with four other expert men at the beginning of the year. Over 1,900 cages used for attracting male moths were distributed in 51 townships in 6 New Jersey counties. These were located directly south and west of the area that had once been infested by this insect. No male moths were caught at any of these cages during the year.

EMERGENCY CONSERVATION WORK

For many years attention has been called to gypsy-moth infestations between the barrier zone and the Connecticut River, and their presence emphasized as a constant threat to success in maintaining the barrier zone.

In connection with the emergency conservation work which is being carried on throughout the United States, an arrangement has been made for the organization of a group of men in 10 camps of the Civilian Conservation Corps in the States of Vermont, Massachusetts, and Connecticut to carry on gypsy-moth scouting and clean-up work in this area. This work is in the formative stage, and it is hoped that with the completion of this organization early in the coming fiscal year it will be possible to find and treat the more heavily infested areas so that westward spread into the zone may be curtailed.

QUARANTINE AND INSPECTION WORK

During November and December the inspection of Christmas trees and greenery required the services of a number of agents who were transferred temporarily from the scouting force. As there were less calls for Christmas trees and greenery than in the past, there was a considerable falling off in such shipments particularly in carload lots of Christmas trees. During the spring and fall shipping seasons a considerable amount of nursery stock was moved, but in general orders were smaller than during the preceding year. There was a decrease in the number of carloads of nursery stock shipped, but in some cases the smaller units increased to a marked extent. Nurserymen reported that they were receiving about as many orders as formerly but these were smaller. Because of the volume of inspection it was necessary to transfer agents from the scouting force to assist the regular inspectors in the examination of nursery stock.

Tables 1 to 3 indicate the volume and kinds of products inspected and certified during the fiscal year.

TABLE 1.—*Evergreen products certified under gypsy-moth quarantine, fiscal year 1933*

Material	Bags	Bales	Boxes	Bundles	Carloads	Packages	Trees	Truck loads	Products found infested	Gypsy-moth egg clusters found
Balsam twigs.....	265	3	8	3		35				
Boughs.....		11,542	21		35	4				
Christmas trees.....					428		74,618		{1 carload..... 1 truck load.....}	3
Laurel.....	751	6,213	546	1,267		39		7		
Mixed greens.....	56	64	7,714	196		77			1 box.....	2
Miscellaneous.....		8	244	27		57		1		
Total.....	1,072	17,830	8,533	1,493	463	212	74,618	8	{1 carload..... 1 truck load..... 1 box.....}	5

TABLE 2.—*Forest products certified under gypsy-moth quarantine, fiscal year 1933*

Material	Bags	Barge loads	Boxes	Bundles	Carloads	Cases	Cords	Lots	Pieces	Truck loads	Products found infested	Gypsy moths found	
												Egg clusters	Larvae and pupae
Barrel parts.....				48	9	2			4	1			
Crates and cratings.....						13			86	1	1 piece.....	1	
Fuel wood.....	25		1	11	30		110	4		212	{23 bags..... 1 box.....}	36	
Logs.....					23				79	452	1 car.....	2	
Lumber.....	2	5		1	361			140		205	{1 barge..... 10 cars..... 7 lots.....}	117	7
Piles and poles.....		1		7	37				1,794	39	1 car.....	36	
Posts.....			1		10				437	6			
Pulpwood.....					957		9			2,070			
Reels.....					158			1	5,195	2	{3 cars..... 9 pieces.....}	28	
Shavings.....					34								
Ship knees.....									291				
Shrub and vine cuttings.....	1		107	247		9				3	{1 box..... 1 bundle.....}	2	1
Ties.....					616				12	16		14	
Miscellaneous.....	4		30	251	192	40	50	7	13,950	657	2 cars.....	98	
Total.....	32	6	139	565	2,427	64	169	152	21,848	3,664	(?)	334	8

¹ Egg clusters on car stakes.² Infested total: 1 barge, 23 bags, 2 boxes, 1 bundle, 17 cars, 7 lots, 10 pieces.³ All larvae.

TABLE 3.—Stone and quarry products certified under gypsy-moth quarantine, fiscal year 1933

Material	Barge loads	Barrels	Boxes	Carloads	Crates	Pieces	Truck loads	Products found infested	Gypsy moths found	
									Egg clusters	Larvae and pupae
Crushed rock				725			1			
Curbing				113		1	12			
Feldspar				43						
Granite	136		360	2,684	840	83,977	232	{ 7 cars 1 piece	136	24
Grout	28			80				4 cars	13	
Marble		8	12,912	1,220	23,998	3,074	2			
Paving	5		5	88				6 cars	15	1
Miscellaneous		5	152	4	4	17	23	1 truck	2	
Total	169	13	13,429	4,957	24,842	87,069	270	{ 17 cars 1 piece 1 truck	66	5

¹ This does not include 212 egg clusters, 11 larvae, 47 pupae found on car stakes, blocking, and crating material.
² Includes 3 gypsy-moth pupae and 1 brown-tail larva.

Nursery stock certified under the gypsy-moth quarantine during the fiscal year consisted of 9,697 bales, 4,937 boxes, 124 carloads, 31,749 cases, 421 cash-and-carry packages, 9,370 packages, and 1,784 truck loads. Of these, 7 bales, 4 boxes, 10 cars, 6 cases, 1 package, and 3 truck loads were found infested with 39 gypsy-moth egg clusters, 8 gypsy-moth larvae, and 2 brown-tail winter webs.

Under a provision of the gypsy-moth-quarantine regulations, material which originates outside of the quarantined area may be shipped from points inside the area under permit. During the fiscal year nearly all types of products shipped under certificates were also shipped under permit. Permits were issued for the shipment of 4,332 individual or bulk lots.

Materials that have been manufactured, processed, or stored in such manner that, in the judgment of the inspector, no infestation could be transmitted, may be moved if accompanied by permits issued to the shipper. One hundred and three firms or individuals are now shipping under permit. During the fiscal year 8,159 individual or bulk lots were shipped.

During the time not required for regular inspection and certification work the inspectors have examined tourist camps for gypsy-moth or brown-tail moth infestation. The reports on this work cover 257 camps. Sixty-three camps were found infested with the gypsy moth to some extent, and three were also infested with the brown-tail moth. Eradication was recommended to owners. This has been done and the infestations destroyed.

VIOLATIONS

Investigations were made of 293 violations of the Federal and State gypsy-moth and brown-tail-moth quarantines, and of 52 reported violations of other quarantines effective in the New England territory. Most of these were non-commercial shipments, and about 80 percent were small shipments by mail. In no case was evidence secured of willful intent to evade quarantine requirements.

COOPERATION

As in the past, cordial cooperative relations have existed between the States concerned and the activities administered by the gypsy-moth project. The results secured during the present fiscal year have in a large measure been attributable to the interest and support of the States and the local officials with whom we maintain active cooperation.

THE BROWN-TAIL MOTH

The infestation of the brown-tail moth (*Nygmia phaeorrhoea* Don.) was more severe than during the previous season, especially in Maine and New Hampshire, and over 1,127,000 hibernating webs were cut and destroyed in New Hampshire and Massachusetts. No record is available of the webs that were cut in Maine.

There was a material spread of this insect beyond the quarantine line in Maine and New Hampshire, even reaching into five towns along the Connecticut River in Vermont.

THE SATIN MOTH

The satin moth (*Stilpnotia salicis* L.) was not so abundant during the summer of 1932 in the older infested areas as it had been during some of the previous seasons. However, severe defoliation of shade trees occurred in many places. Funds did not permit a thorough scouting of towns to determine the spread of this insect, and it was found in only two towns beyond the quarantined area. Fourteen violations of the satin-moth quarantine were reported and investigated during the year.

EUROPEAN CORN-BORER QUARANTINE AND CONTROL

GENERAL STATUS

Lack of adequate appropriated funds with which effectively to enforce the quarantine regulations on account of the European corn borer (*Pyrausta nubilalis* Hubn.) led to revocation of Notice of Quarantine No. 43, revised, on July 15, 1932. The Bureau's estimate for corn-borer quarantine and control during the 1933 fiscal year amounted to \$795,000, or \$155,000 less than the previous year's appropriation. As finally passed, the agricultural appropriation bill contained an item of \$295,000 for maintenance of this work. It had been contemplated by the House Committee on Appropriations that the work could be continued with the reduced funds by eliminating road-patrol activities. Thorough consideration of the situation by Department officials indicated that the sum allotted was entirely inadequate to prevent movement via common carriers or motor vehicles of corn from infested to noninfested sections, and to carry out other protective measures which uninfested States might reasonably expect under a continuance of Federal quarantine. There remained no alternative but to revoke the quarantine and thus give uninfested States an opportunity to enforce such protective measures as they deemed necessary. Numerous quarantines paralleling the Federal regulations and restricting intrastate movement of affected products within infested States were also revoked following the Federal action.

In order that States outside the infested zone might have information upon which to base quarantine action, scouting operations along the periphery of the previously regulated territory were conducted as in former years.

Within a few days of the Department's announcement of the lifting of the Federal corn-borer quarantine, regulatory officials of four Corn Belt States met at Kansas City, Mo., for the purpose of considering uniform State quarantine action. State corn-borer quarantines and embargoes followed in quick succession after the Secretary's announcement of cancelation of the restrictions. A complete embargo on the movement of articles restricted in the revoked quarantine was issued by the State of Georgia coeffective with revocation of the Federal regulations. Louisiana followed on July 26 with a similar embargo, and during August, September, and October embargoes affecting the same articles were issued by Arizona, California, Nevada, Oregon, Utah, and Colorado. In November, Wyoming issued a still stricter embargo covering articles additional to those included in canceled Federal regulations. Indiana, as yet known to be infested only with the 1-generation strain of the borer, in May 1933 promulgated a quarantine against those States infested with the 2-generation strain of the insect.

Comparatively uniform restrictive quarantines were issued during July and August by the appropriate State officials of Illinois, Iowa, Kansas, Mississippi, Missouri, Nebraska, and Wisconsin. Similar action by South Carolina followed in October. Under these quarantines no distinction is made between the sections infested with the 2-generation strain and those infested with the 1-generation type of the insect. In addition, the restrictions in most cases apply to a class of articles exempt from the previously existing Federal regulations. These State quarantines admit certain quarantined products either when so manufactured or processed as to eliminate the corn borer or when inspected and certified by authorized State or Federal inspectors.

State quarantines under which State certification of restricted articles is acceptable and which contain special provisions not found in other quarantine groups were issued on various dates from July to October by Florida, Texas, Oklahoma, Kentucky, and Tennessee.

Each of the State embargoes or quarantine orders designates the following States as infested: Connecticut, Indiana, Maine, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont,

and West Virginia. In some instances Wisconsin is also mentioned among the States from which shipments are restricted, and the quarantines frequently apply to any additional States in which infestation may hereafter be found.

Regulatory action as a result of revocation of the Federal regulations has been taken by all uninfested States except Alabama, Delaware, Idaho, Minnesota, Montana, North Carolina, and North Dakota.

Extended conferences and correspondence with officials in States imposing embargoes finally resulted in agreement on the part of regulatory officials in Arizona, California, Colorado, Georgia, Louisiana, Nevada, Oregon, and Utah to accept Federal certification on quarantined articles shipped in accordance with the provisions of the Federal regulations in effect prior to July 15, 1932. Most of these agreements became effective in January 1933, with the revision of embargoes to provide for shipments into their respective States of quarantined articles from the infested zones when accompanied by Federal certification evidencing freedom from corn borer. Wyoming still retains its original embargo order.

Decision to inaugurate a Federal corn-borer inspection and certification service required a systematic survey of formerly quarantined territory to determine the amount of certification required and to acquaint dealers with the available service. The survey began in January and was concluded early in March. Territory in all States affected by the State requirements for Federal certification was divided into districts and various sections assigned to each of 23 men engaged in the survey. Although a complete survey was required of establishments shipping restricted articles, especial attention was first directed to large shippers of dahlia tubers, whose shipping season was near at hand. At the conclusion of the survey, the probable demands for Federal certification were summarized, and the surveyed territory was subdivided into areas which could be served conveniently by single inspectors. Territories as assigned early in March are as follows: Eastern Michigan, western Michigan, northern Indiana, southern Indiana and southwestern Ohio, northern Ohio, southeastern Ohio and West Virginia, western Pennsylvania, eastern Pennsylvania, New Jersey, southeastern New York and Fairfield County, Conn., western New York, northeastern New York, and the State of Connecticut other than Fairfield County. Inspection and certification in the New England States is furnished by inspectors working from the Boston and Springfield, Mass., field offices. In the 4 months that this inspection service has been available during the fiscal year, over 3,500 lots of quarantined articles were inspected and certified for movement to States accepting only Federal certification.

For the purpose of enforcing the Illinois quarantine, State authorities enlisted the cooperation of county police officials along the Illinois-Indiana State line from Lake Michigan to the Wabash River. These officials assisted in preventing the movement through their counties of uncertified quarantined material. Squads of Illinois highway police were also stationed for a time on roads leading into the State from Indiana. Truck loads of contraband material were turned back. Express shipments of produce moving contrary to the quarantine were confiscated. Three Illinois inspectors were stationed in Chicago to check, in compliance with the regulations, the receipt of quarantined articles in the market district. For a short period, three shifts of Michigan State inspectors were stationed at Benton Harbor, Mich., for the purpose of inspecting and certifying celery and other farm produce affected by the Illinois quarantine.

Enforcement of State regulations in general was largely secured through instructions issued by common carriers to their agents regarding acceptance of restricted material for movement into States quarantining against the infested States. Under the laws of many of the States, articles shipped contrary to regulatory orders are subject to confiscation when found within the State.

Recommendations issued in November by the joint committee on the European corn borer, a committee composed of representatives of each of five national professional societies, again recognized the value of the Federal quarantine in preventing long-distance spread of the pest.

SCOUTING AND NEWLY DISCOVERED CORN-BORER INFESTATIONS

Field inspections to determine spread of the borer in 1932 were completely organized by July 31. The 228 men comprising the 83 crews assigned to work in the western area were trained at 2 scout schools conducted at the Department-owned farm near Toledo, Ohio. The State of Illinois employed 16 of these scouts. The State of Wisconsin also furnished 2 crews of 3 men each. Sixty-six men were trained at a scout school held at Freehold, N.J. After

receiving instruction in their duties and examining infested cornfields in the vicinity of Freehold, these men were assigned to scout in sections outside the known infested districts of the Eastern States. Routine scouting activities in both the western and central areas were discontinued on September 13. A small amount of rechecking, rescouting, and river scouting was continued for a few weeks after that date.

Spread of the borer, as determined by scouting operations during the summer of 1932, was much less than the usual annual migration of the insect. Weather conditions in the spring and early summer largely unfavorable for flight of the adult moths evidently accounted for this less-than-normal spread. Newly infested townships were found in seven States. These new infestations are located within comparatively short distances of territory previously known to be infested.

Scouting in Mosel township, Sheboygan County, and Centerville township, Manitowoc County, Wis., in which townships a few borers were discovered in 1931 and where clean-up measures were subsequently practiced, gave negative results. Field surveys farther south in the lake counties of Wisconsin resulted in the collection of 13 borers on a farm in Mount Pleasant township, Racine County. This first-record find is the most remote from known infested territory of those discovered in 1932. Activities in Indiana resulted in the finding of small infestations of from 1 to 3 borers each in 7 townships of 5 counties in previously uninfested districts in the northwestern and southeastern sections of the State. The latter localities are all in close proximity to known infested sections.

Field operations in Kentucky led to discovery of a single borer in section no. 4, near Newport, in Campbell County. This section is near the Ohio River in one of the northernmost Kentucky counties. Only one new infestation, a find of three borers, was recorded in West Virginia. This find was made on a farm in Union township, Marion County. A single township intervenes between this infestation and previously regulated territory. A fairly scattered infestation throughout Bucks County, Pa., was indicated by observations of infestations in Nockamixon, Bridgeton, and Tinicum townships. Bucks County adjoins the 1-generation infested zone.

Scouting in Delaware and counties not known to be infested in New Jersey gave negative results. Surveys in the lower Eastern Shore sections of Maryland disclosed 5 infested districts in 2 counties. A farm in Willards district, Wicomico County, yielded two borers. In adjoining Worcester County, single infestation were found in the districts of Colbourne, Newark, and Snow Hill. In Stocktons district of the same county, infestations were found on two farms.

A single borer collected in Temperanceville district of Accomac County, Va., indicates that the clean-up of the small infestation discovered there in 1931 did not reach all borers in the section. In addition to the specimen collected in the Temperanceville district, first-record finds were made in Metompkin and Lee districts of the same county.

STATE COMPULSORY CLEAN-UP CAMPAIGNS

Probably the most vigorous of the compulsory clean-up campaigns undertaken by infested States were those conducted by Connecticut, Maine, Massachusetts, and Rhode Island. In Connecticut, a clean-up crew of 21 men, each supplied with a light truck, began their work in the southern half of the State on April 12. Examinations for cornstalks or stubble were gradually extended to the northern tier of counties. The survey was completed early in June. Only 3 prosecutions were necessary, 2 of which were occasioned by the refusal of owners to plow and burn cornstalks in compliance with the State orders.

Half an acre of sweet corn in which infestation was discovered in a suburb of Racine, Wis., was promptly cut and destroyed.

Several demonstrations of corn-borer-control implements were staged in cooperation with State or county agricultural officials in a number of Connecticut and Massachusetts localities.

FALL SURVEY OF INFESTATION

Surveys for degree of infestation were started in Indiana, Ohio, and Michigan on August 15 by 16 men withdrawn from the regular scouting crews for the purpose. In addition, the Bureau of Entomology furnished 6 experienced scouts, and the State of Indiana supplied 1 man for borer-population counts. Similar work in eastern seaboard infested States began shortly thereafter. Five men were provided by this Bureau for the work in the Middle Atlantic and New England States. Survey work in the western area was completed on September 15. In the eastern district it extended until September 23.

Data collected in the cooperative fall-infestation survey of 1932 were compiled by the Bureau of Entomology. In the 1-generation infested sections, significant borer increases over 1931 were noted in the southeastern Michigan counties south of Saginaw Bay and bordering on the bay and on Lakes Huron and Erie, as well as in the five additional counties in the southeastern corner of the State. Four other Michigan counties evidenced no change in borer population, and a decrease was registered in a single county of the State. Of 4 counties surveyed in northeastern Indiana 1 showed an increase, 1 a decrease, and the remainder no change in degree of infestation. More territory was covered by the survey in Ohio than in any other State. Northwestern Ohio counties bordering on Lake Erie and for several tiers south into the corn-growing sections disclosed no significant change in borers per hundred stalks over the previous year's records. Two counties bordering on Lake Erie in the northeastern corner of Ohio disclosed increases in infestation, as did 5 counties south of the older infested territory, and 3 northwestern counties. Champaign County, quite near the southern border of known corn-borer infestation, disclosed a rather generally distributed corn-borer population. In only one Ohio county was a decrease in infestation recorded. In Erie County, Pa., the only county surveyed in that State, examination of cornfields showed an increase in the number of borers per 100 plants. Surveys of 8 northern lake counties of New York showed decreases in 2 counties and no significant change in the others. Increased infestation in New York counties was confined to Cattaraugus County in the southwest and Schoharie County in the Albany district. Three counties in the Albany district, and Wyoming County in the western part of New York, remained unchanged in borer concentration.

In the 2-generation area, the infestation survey was extended to include recently infested territory in New Jersey, Connecticut, Massachusetts, Vermont, and New Hampshire. Data comparable to that obtained in the last fall survey, conducted in 1930 in the New England States, indicate considerable increase in the average number of borers per 100 plants throughout the area as a whole. Of the 2 counties surveyed in Maine, 1 showed no change in infestation and the other evidenced an increase in borer concentration. Increases were recorded in all three counties previously surveyed in New Hampshire. In Massachusetts, Essex and Barnstable Counties registered increases, Middlesex, Norfolk, and Bristol Counties decreases, and Worcester and Plymouth Counties an unchanged status. The greater part of Rhode Island showed no appreciable change in degree of infestation, although an increase was noted in Newport and Bristol Counties. Report was also received of the initial infestation of Block Island, off the coast of Rhode Island. Spread of the insect from the mainland to the island required a moth flight of from 20 to 30 miles from the towns of Middletown and Little Compton in Newport County. Considerable increase in general infestation was evidenced in Connecticut. A comparison of data from 1930 discloses approximately the same degree of infestation in New Haven and Windham Counties, and significant increases in Tolland, New London, and Middlesex Counties. A fivefold increase in larval population in Suffolk County, Long Island, was observed as a result of examination of the corn crop affected by the second-generation borers. Combined injuries by the corn borer, corn ear worm, and Stewart's disease resulted in a 50 percent reduction in the corn yield in this Long Island county.

Throughout the 1-generation area surveyed the average number of borers per 100 plants increased from 16.6 in 1930 to 31.7 in 1931 and 33.5 in 1932. Similar comparisons in the 2-generation area are 82.6 in 1929, 58.9 in 1930, and 91 in 1932. No 1931 fall survey was made in the latter area.

CONSOLIDATION OF HEADQUARTERS

Motor-vehicle, spraying, and other equipment on hand at the Springfield, Ohio, western-area headquarters was moved to New Cumberland, Pa., where it is now stored in a large warehouse at the general depot of the United States Army. With the transfer of the general headquarters from South Norwalk, Conn., to Harrisburg, Pa., in May, the personnel at Springfield was transferred to either the New Cumberland depot or to the Harrisburg headquarters. Both the Springfield and South Norwalk buildings were vacated at the end of the fiscal year.

Several members of the permanent corn-borer personnel were transferred from corn-borer to Japanese beetle rolls and assigned to enforcement activities under the Japanese-beetle quarantine.

Quantities of tools, farm implements, sprayers, and motor vehicles were reconditioned and transferred to the pink-bollworm and gypsy-moth projects.

JAPANESE BEETLE QUARANTINE AND CONTROL

EXTENT OF INFESTATION

The abandonment of visual field surveys by scouts and the substitution therefor of traps for the purpose of determining the presence or absence of the Japanese beetle (*Popillia japonica* Newm.) in nonregulated territory were responsible for discovery during the summer of 1932 of first-record infestations in greater numbers and at points farther removed from the infested sections than previously recorded. Catches ranging from 1 to 10 beetles were made in 94 cities and towns. Finds of so few beetles in a locality are largely indicative of incipient infestations, possibly of the current year's spread. Collections in sufficient numbers to indicate apparent overwintering infestations were made in 49 cities and towns. Catches at these 143 cities and towns not previously known to be infested totaled 3,688 beetles.

Observations in sections densely infested with the Japanese beetle indicated that the insect during the summer of 1932 probably caused greater destruction of fruit and produce crops than in any year since its discovery in 1916. For the past several years adult beetles have been known to cause considerable commercial damage to cut flowers grown throughout the winter and spring months in greenhouses in the Philadelphia zone. This condition has continued. A few instances have also been observed of heavy concentrations of larvae in uncertified nursery plots destroying evergreen stock, thus compelling the poisoning of the nursery block with arsenate of lead to protect the stock. Such treatment has been entirely for plant protection rather than in compliance with the quarantine requirements. Beetle population increases were sufficient in Long Island and Westchester County, N.Y., and the northeastern counties of New Jersey, to arouse public interest and require the attention of city foresters and park departments in combating the insect. Adult beetle flight of noticeable proportions took place in sections of Wilmington, Del., and Harrisburg, Pa. Through the county agent of Burlington County, N.J., heavy beetle damage to soybeans was reported for the first time, requiring early harvesting of the crop to prevent entire destruction of the stand.

Surveys were made for 7 weeks during the summer of 1932 to determine the extent of the sections in southern New Jersey, southeastern Pennsylvania, and northern Delaware in which Japanese-beetle defoliation or partial defoliation of favored food plants was conspicuous and readily observable from an automobile proceeding at a moderate rate of speed. Defoliation to the extent of between 75 and 100 percent was obvious over an area of 1,647 square miles. Damage of from 50 to 75 percent was evident in 1,378 square miles. Evidence of at least 25 percent foliage injury was observed over an additional area of 1,353 square miles. A total of 4,378 square miles was found infested to the degrees noted. Among the plants wholly or partly defoliated were apples, peaches, cherries, plums, quinces, lindens, willows, larch, young Norway maples, sassafras, horsechestnuts, grapes, raspberries, blueberries, blackberries, certain vegetables, and a number of ornamental plants. Adult feeding on the silk of field and sugar corn also resulted in reduced yields of these crops. In this densely infested section, heavy concentrations of grubs destroyed or badly injured the sod in many lawns and golf courses.

The regulated area as effective January 23, 1933, includes the New England States, with the exception of Maine and the northern halves of New Hampshire and Vermont; the Middle Atlantic States, exclusive of territory in northwestern Pennsylvania and northern New York contiguous to the lake region and Canadian border; together with the District of Columbia, the State of Delaware, and limited sections of Maryland and Virginia. Included in the regulated territory are 97,690 square miles. In addition to the main regulated zone, there are 10 small isolated regulated sections, 3 in Virginia, and 7 in Maryland. This enlarged area places under regulation all infestations of an apparently established nature. It is believed that the few beetles trapped in West Virginia, the Shenandoah Valley, western New York, Maine, Michigan, Ohio, North Carolina, and South Carolina are not indicative of established infestations warranting quarantine extension.

Field inspections by scouts in the summer of 1932 were confined to examination of 1,230 class I nursery and greenhouse establishments and nearby premises. Scout collections indicated that the insect had spread to 163 classified premises which in previous years had been found free from infestation. This is a much greater spread of the insect than took place last year, when initial infestations were found on only 126 classified nursery or greenhouse premises.

All field work to determine the present scope of the beetle outside the 51,339 square miles then under regulation was performed with traps. The 1932 field-inspection work was of greater scope than any previously attempted. Traps were in operation in all Atlantic Coastal States and in selected cities in States as far west as Michigan. In all, 45,721 traps were used in determining the presence or absence of beetles in nonregulated territory. In most communities examined, 400 traps were distributed at points of likely infestation. Traps on each route were periodically visited by a trap inspector. Experienced men with small trucks were assigned to supervise the work of a number of trap inspectors. Trapping was already in progress in Florida, Georgia, North Carolina, South Carolina, Virginia, Maryland, West Virginia, and Ohio at the beginning of the fiscal year. During July, trap distribution began in Pennsylvania, New York, Massachusetts, New Hampshire, and Michigan. Final placement of traps was made in Vermont and Maine during August. Throughout the summer traps were operated for periods varying from 30 to 60 days in 3 cities each in Florida and Georgia, 4 cities in South Carolina, 5 cities in North Carolina, and 3 cities in West Virginia. In the unregulated portions of States already partially quarantined, traps were in operation in 32 towns and cities in Virginia, 35 communities in Maryland, 50 localities in Pennsylvania, 43 localities in New York, and in 62 Massachusetts towns and cities. The New England trapping program was carried on in 6 cities each in Maine, New Hampshire, and Vermont. In the East North Central States traps were placed in 13 Ohio cities, in Detroit, Mich., and Richmond, Ind. Selection of these 273 towns and cities as sites for trapping activities was made on the basis of their ranking as transportation centers, as possible destination points of illegally transported infested produce or nursery stock, or as possible centers affording favorable environments for the establishment of a few beetles accidentally carried from the zone of heavy infestation.

Most remote from the regulated zone of the first-record finds are the infestations of a few beetles each discovered at Florence, S.C.; Winston-Salem, Raleigh, and Durham, N.C.; Roanoke and Lynchburg, Va.; Wheeling, W.Va.; Canton, Cleveland, Columbus, Steubenville, and Zanesville, Ohio; Detroit, Mich.; Buffalo, Niagara Falls, Rochester, and Syracuse, N.Y.; Bellows Falls, Brattleboro, Rutland, and White River Junction, Vt.; Dover, Keene, Manchester, Portsmouth, and West Lebanon, N.H.; and Augusta, Kennebunk, and Portland, Maine. Beetles in considerable numbers were collected at the site of the newly discovered infestation in Concord, N.H. In the unregulated portion of Pennsylvania, infestations in 27 localities were determined. Beetles were collected in 17 cities and towns in nonregulated territory of Virginia, and in 31 communities outside the then-restricted zone in Massachusetts.

An incipient infestation discovered at Charleston, S.C., in 1931 and surface treated the following fall with arsenate of lead failed to disclose any beetles in 1932. Nominal increase only was noted at previously discovered infestations in Annapolis and Chevy Chase, Md.; Boston, Mass.; Buffalo and Little Falls, N.Y.; Cleveland and Columbus, Ohio; Laughlintown, Ligonier, New Castle, Pittsburgh, and Tyrone, Pa.; and Richmond, Va.

Trapping activities for the summer of 1933 were fully organized in North Carolina, South Carolina, Virginia, and West Virginia by the end of the fiscal year. First placement of traps was made in Charleston, S.C., on May 27. The only first-record find recorded was a catch of two beetles at Emporia, Va.

SUPPRESSIVE MEASURES

Intensive eradication measures were applied at Erie, Pa. In conjunction with the season's trapping activities, surface application of lead arsenate was made to soil and sod in infested sections. Throughout the summer, trap inspectors made six applications of poison spray containing attractants to foliage in the infested district of the city. Traps distributed in Erie during 1931 yielded 170 beetles. Catches of 282 beetles were made in 1932, an increase which is not considered significant.

Application of lead arsenate to the two small sections in Detroit, Mich., where a few beetles were trapped in August 1932 was completed in September. This suppressive work was a joint project with the authorities of the State of Michigan and the city of Detroit. Similar poison application was made at the site where two beetles were trapped at Florence, S.C. Lead arsenate for the latter work was supplied by the State of South Carolina.

Community spraying for Japanese-beetle control, in cooperation with the Maryland State Horticultural Department, was carried on during June 1933 in

Laurel, Colgate, and near Elkton. These infestations are separated from the continuously infested sections centering about Philadelphia. Infestations in these localities approach conditions found in the densely infested sections farther north. Excellent coverage with coated lead arsenate of all foliage in the sprayed communities assured protection to vegetation, some of which during several years past has been subject to complete defoliation. Instead of adding geraniol and syroline to the spray mixture, as was done at Erie, Pa., during the summer of 1932, perforated metal cages each containing a small jar of geraniol-eugenol mixture, equipped with a wick for volatilizing the liquid, were hung in sprayed shrubs and trees of the species known to be preferred food plants of the insect. Beetles thus attracted to the poisoned foliage consume enough of the lead oleate-lead arsenate insecticide to receive a toxic dose.

Beetle depopulating demonstrations were performed in Philadelphia, Pa., and Trenton, N.J., during the summer of 1932. In Philadelphia, the operation of 472 traps for a period of 9 weeks on 6 poisoned plots planted to a preferred food plant of the insect resulted in catches of about 2,800 pounds of beetles. Maintenance of 63 traps at Trenton during the season resulted in a total catch of over 633,000 beetles. Despite the quantities of beetles collected in connection with these demonstrations, the number of the insects in the immediate vicinity of the traps was not greatly depleted.

Large-scale trapping activities initiated during July and August by the State of New Jersey in the densely infested sections of Salem County, in southern New Jersey, resulted in the collection in 2,100 traps of over 500 millions, or 55 tons, of beetles.

An improved method of baiting the traps was adopted, liquid bait, containing geraniol and eugenol, being substituted for the bran bait mixture formerly used. Small jars equipped with wicks are used to vaporize the oils. The advantages accruing from the use of the liquid bait are reduction in time required to prepare the bait, reduced bulk and weight, and consequent lower haulage costs in moving large quantities of trap equipment for long distances.

ROAD STATIONS

Border patrol stations, established during the previous April, were already in operation on 18 highways at the beginning of the fiscal year. These vehicular-inspection stations were concentrated on the highways leading from the regulated sections of Pennsylvania, Maryland, and Virginia. Highways chosen for the road-inspection work were the mainly traveled routes from heavily infested zones to points west and south. Thirteen of the stations were continued until fall. Five other stations were closed and reopened as the seasonal movement of quarantined articles justified. Road-inspection work was discontinued for 1932 with the closing between November 9 and 26 of the 17 stations then in operation. The 1933 border-patrol activities began with the reestablishment of stations in Maryland and Virginia late in March. Reorganization of the work in Pennsylvania and New York followed as rapidly as inspectors could be instructed in their duties. At the close of the fiscal year 25 established road-inspection stations were located at the borders of the regulated territory in Virginia, Maryland, and along the Pennsylvania-West Virginia and Pennsylvania-Ohio State lines. A roving patrol of 4 Pennsylvania State inspectors covers 8 roads leading into the nonregulated section of northwestern Pennsylvania. Another Pennsylvania inspector maintains an established post. Road-inspection work was revived in New York State with the establishment in mid-April of a mobile patrol of four State-employed inspectors who alternate their hours between 10 highways over which most of the quarantined articles move west from the regulated portion of northern New York.

Stations in operation during the fiscal year stopped 1,349,323 road vehicles, 15,729 of which were found to be carrying contraband material. Among the insect material removed from the contraband surrendered at the road stations were 253 grubs and adults of the Japanese beetle.

CERTIFICATION AND TREATMENT OF NURSERY STOCK

Under a revised interpretation of the nursery classification regulations, effective in October, class III status is now confined exclusively to establishments on which beetles or grubs have been found, or establishments quite definitely determined as in a generally infested section and within 500 feet of which beetles have been collected. Under this interpretation of the regulations 68 nurseries which had been given a class III status were reassigned to class I, and thereby

permitted to ship their stock without chemical treatment or freeing it from soil. All establishments returned to class I were scouted during the summer of 1932 and their actual premises found free from beetles.

A joint certification plan was inaugurated in the spring of 1933 whereby, in territory in which inspection and certification requirements under the gypsy-moth and Japanese-beetle quarantines overlap, inspections may be made and certificates issued by either the gypsy-moth or Japanese-beetle inspector. Inspectors performing this joint certification are supplied with rubber stamps with which they may affix to packages containing inspected material a joint certificate showing compliance with both Quarantines Nos. 45 and 48. All men thus engaged were instructed in their duties by the appropriate cooperating project. Records of the materials jointly certified are furnished to the field offices of both projects.

Nursery and greenhouse establishments maintaining classified status under the quarantine regulations have increased in number during the year from 1,676 to 2,424. While extension of the area accounts for a large proportion of the increase, surveys within the previously regulated territory to acquaint plant growers with their privileges under the regulations have also resulted in the addition of many classified premises. Since the recent extension of area, many shippers in centrally located sections of the regulated territory have relinquished their classified status, as their shipments of plant material are now wholly within the zones under regulation.

With the growth of the regulated territory and the increase in the number of classified nurseries and greenhouses in infested sections, supervision of interdealer movement of certified stock between classified establishments has grown to considerable proportions. Since classified establishments are obliged, under the precautions necessary to assure eligibility of their entire stock, to receive only certified stock on their premises, large quantities of stock moving to such premises require inspection and certification, although portions of material so received may not eventually be reshipped to nonregulated States.

Results of analyses by chemists of the Technological Division of soil samples collected in lead-arsenate-treated nursery plots and coldframes were made available from April to June. Upon receipt of the data, the information was in turn transmitted to the nursery concerned. As a result of the analyses, 44.5 acres of nursery plots and frames, containing 210,887 plants, were re-treated prior to July 1 with lead arsenate in sufficient quantity to restore the treated frames or plots to the prescribed dosage of 1,500 pounds per acre.

A supplement to the requirements for the disinfection of nursery products issued in August 1932 permits the treatment of potting soil with lead arsenate. Previously soil for use in potting plants later to be shipped under certification required treatment in a closed container with raw carbon disulphide. Treatment of the soil with lead arsenate must be performed prior to August 1. The poisoned soil may then be used between October 1 and the following June 15.

CERTIFICATION OF FRUITS, VEGETABLES, AND CUT FLOWERS

Seasonal regulation of movement of quarantined farm products became effective on June 15. Rapid disappearance early in September of adult Japanese beetles made possible lifting of the farm-products-certification requirements on September 17. Active adult flight of the insect ceased several weeks prior to the lifting of the summer restrictions. What few beetles were still in evidence in mid-September were largely inactive, confining their feeding to the blooms of specially favored food plants, such as the dahlia. This latter condition made it necessary that the inspection and certification of all cut flowers moving to non-regulated territory be maintained until October 15. Inspectors operating in the wholesale-cut-flower establishments in Philadelphia were still removing beetles from inspected blooms as late as September 30.

The presence of large numbers of adult beetles in the market and waterfront districts of Philadelphia persisted from July 12 to August 12. As has been the practice in past years, inspection service during this period was confined to the daily hours of beetle inactivity.

Fruits and vegetables subject to quarantine restrictions during the summer of 1932 were limited to nine farm products which are especially susceptible to beetle infestation in the fields where grown. Reduction in the number of classes of farm products under restriction and enlargement of the New York regulated area considerably curtailed the amount of quarantined farm products and cut flowers shipped under certification. Despite the reduced quantity of articles

offered for inspection during the seasonal quarantine, approximately 45,500 lot shipments of these certified articles moved from the regulated area. Inspections were made at 67 inspection centers conveniently scattered throughout the infested zone, and 1,843 beetles were removed from articles presented for inspection.

Construction of a fumigation house was completed in the spring of 1932 by a cooperative blueberry grower's association at New Lisbon, N.J. All blueberries certified for movement from the regulated zone, and a large proportion of berry shipments to infested sections, were fumigated with carbon disulphide. Although fumigation of the latter shipments is not required as a requisite for their movement, the chemical treatments were made to kill any Japanese beetles that might be present in the cellophane-wrapped packages. Japanese beetles feeding in such closed packages have been found to affect the salability of quality berries. The municipally owned fumigation house at Hammonton, in the blackberry- and raspberry-growing sections of southern New Jersey, was continued in operation while beetles were in flight during the summer of 1932.

Modification of the requirements for the disinfection of bananas unloaded from boats docked at Philadelphia during the active flight period of the insect permitted the use of liquid hydrocyanic acid gas as a fumigant for refrigerator cars loaded with this product. Heretofore a calcium compound of the acid had been prescribed as the medium for liberating the poisonous gas. This modified practice permits a reduction in the cost of materials per car from approximately \$3.45 to \$0.38. Greater care must be exercised in injecting the quickly volatilizing liquid into the car and the operator is equipped with a gas mask, which was unnecessary when the solid form of fumigant was used.

Commercially packed apples are exempt from the requirements for certification under the quarantine regulations effective at the beginning of 1933. For quarantine purposes, the definition of commercially packed apples is restricted to apples in closed barrels, boxes, or baskets, of sizes and types customarily used in the apple trade, or apples in open packages when such apples have been graded above the grade of Unclassified in accordance with official State or Federal standards and the containers are marked with such grade.

Demand for inspection and certification of string beans from infested fields in southern New Jersey resulted in the development of a mechanical beetle separator, since beans cannot be fumigated without injuring them. Construction of several separator models finally resulted in the adoption of a type of machine involving essentially a sloping, revolving cylinder 7 feet long, covered with $\frac{1}{2}$ -inch mesh wire, and mounted on an iron frame. Beans are poured through a hopper into the higher end of the cylinder. As the cylinder is revolved by means of a hand crank, the beans tumble without injury to the lower end of the cylinder, where they empty into a hamper. Any beetles present are shaken off and fall through the wire mesh. Surrounding the inner cylinder is a similarly constructed cylinder of larger diameter to catch any beans which may slip through the meshes of the inner cylinder. In tests conducted with the machine and with inspectors making visual inspections of the beans, the mechanical separator in every case proved more efficient than the inspector in ridding beans of known infestations of beetles.

Inspection and certification of green stringless beans and wax beans from an extensive bean-growing section within a radius of 20 miles of Baltimore, Md., were handled largely through the periodic scouting of 425 bean farms, and the accrediting of uninfested growing sections. Bean shippers in Baltimore desiring subsequent certification of their purchases in carload lots receive in their screened bean houses only certified beans. Beans from accredited farms receive immediate certification. Products from infested fields require inspection at a platform maintained in the market district during the effective period of the seasonal quarantine on fruits and vegetables.

SUMMARY OF CERTIFICATES ISSUED AND OF VIOLATIONS INVESTIGATED

A total of 554,056 certificates of all types was issued during the 12-month period.

Table 4 shows the quarantined articles intended for shipment from the regulated area and for use in certified greenhouses, or surface soil in nursery plots, heeling-in, or plunging areas, which were fumigated or sterilized during the fiscal year.

TABLE 4.—*Materials fumigated or sterilized under Japanese-beetle-quarantine regulations, fiscal year 1933*

Material treated	Number treated with—				
	Arsenate of lead	Carbon disulphide gas or emulsion	Naphthalene	Steam	Hydrocyanic acid
Plants.....number.....	417, 548				
Potting soil.....cubic yards.....	4	2, 639		717	
Mushroom soil.....do.....		369			
Manure.....do.....		25		34	
Leaf mold.....do.....				15	
Sand.....do.....		1, 191		80	
Peat.....do.....		5			
Surface soil.....square feet.....	314, 827	14, 881	2, 159		
Surface soil with plants.....do.....	2, 671, 070				
Bananas.....bunches.....					94, 459
Berries.....crates.....		14, 966			

Nursery and ornamental stock, sand, earth, peat, compost, and manure were certified for shipment from the regulated areas during the fiscal year in the following quantities:

Plants.....	number.....	34, 268, 557
Sand, earth, and clay.....	carloads.....	3, 809
Peat.....	do.....	83
Manure and compost.....	do.....	174

Fruits, vegetables, moss, and cut flowers certified during the seasonal quarantine on these articles were as follows:

Fruits and vegetables.....	packages.....	3, 629, 434
Moss.....	bales.....	355
Cut flowers.....	packages.....	49, 737

Over 1,000 reports of apparent violations of the Japanese-beetle-quarantine regulations were received from all sources during the 12-month period. Investigations were made of all such irregularities, and proceedings were instituted in United States district courts for eight violations of the Plant Quarantine Act arising from shipments contrary to the regulations.

STATE AND MUNICIPAL COOPERATION

Mutually satisfactory relations continued with officials in cooperating States. Appropriations for regulatory and control work were available from the States of Connecticut, Delaware, Maryland, Massachusetts, New Jersey, New York, Pennsylvania, Rhode Island, and Virginia. In addition, the State of South Carolina supplied lead arsenate for the treating work in Florence, and the Michigan State and city authorities concerned cooperated in financing the treating work in Detroit. Numerous community spraying campaigns locally financed in heavily infested cities were again repeated in 1932. Considerable spraying work was performed by private contractors in the environs of Philadelphia. Beetle-collecting contests were held by a number of garden clubs or local officials in newly infested territory. The application of lead arsenate in large quantities to lawns on infested estates and to private golf courses in Philadelphia suburbs has come to be a common practice.

PINK BOLLWORM

ERADICATION MEASURES IN FLORIDA

The pink bollworm (*Pectinophora gossypiella* Saunders) was discovered infesting a species of wild cotton in southern Florida in June 1932. Such of this cotton as grew along the highways and in other easily accessible places constituted an especial danger, as tourists and other travelers could unintentionally distribute the insect to new localities. The eradication of this roadside cotton was therefore immediately begun and was soon completed to the extent that one could pass through the area without finding wild cotton, unless he should take special pains to do so.

A survey was then started to locate all cotton, either wild or domestic, in the southern part of the State. Commercial cotton is not grown south of Alachua County, with the exception of a few small experimental plantings in Sumter, Pasco, and Hillsborough Counties. Wild cotton was, however, found growing along the coast and on keys or islands. On the east coast, the only wild cotton found above Miami consisted of four small colonies on a peninsula in Brevard County, opposite the town of Grant. On the west coast, wild cotton occurs rather generally on both the mainland and adjacent keys from Cape Sable northward to St. Petersburg. The only wild cotton found above this point was a small colony located on a key near Hudson, in Pasco County.

In connection with this survey, it was found that a considerable percentage of the wild cotton was infested. Infestations were discovered along the west coast as far northward as Terra Ceia Island, in Manatee County, while on the east coast the most northerly infestation was discovered on dooryard cotton plants at Lake Worth, in Palm Beach County.

Field inspection of commercial plantings of cultivated cotton in north-central Florida, and the operation of one of the portable gin-trash machines there resulted, on September 26, 1932, in the finding of a specimen in trash from the gin at High Springs, in Alachua County. Inspectors were immediately concentrated in this area, and on October 10, 14 specimens were found in a field 10 miles northwest of High Springs, in Columbia County. Another specimen was found in this same field the following day. On October 8 a pink bollworm was found with the machine in trash from a gin at Lake City, and by field inspection an infestation was located in a field 5 miles southwest of Alachua, in Alachua County, on October 26, two specimens being taken. Field and gin-trash inspections were continued as long as material was available, but no other specimens were found.

As a result of these discoveries, a public hearing was held to consider the advisability of extending the quarantine to cover this area. It developed that several counties east and south of Alachua and Columbia Counties did not have ginning facilities, the cotton produced in such counties being ginned in the infested counties. For this reason Baker, Bradford, Union, and Gilchrist, together with Alachua and Columbia Counties, were placed under regulation effective October 29, 1932. An inspector was placed at Lake City to supervise compliance with the various regulations.

Not a great deal of cotton was grown in the immediate vicinity of the two infested fields, and it was therefore possible to clean all fields within a 5-mile radius of each known infested field. This was done following the conclusion of cotton picking and was completed in December. A total of 169 fields, covering 847 $\frac{1}{4}$ acres, was cleaned in the two counties. The average cost per acre for labor and for fuel for burning the material was \$2.43. The six gins operated in the two counties were thoroughly cleaned at the end of the season; so also were the three oil mills in southern Georgia which had handled seed from the area.

Most of the cotton had been ginned before the regulated area was established. As the gins were not equipped with facilities for sterilizing the seed, a portable sterilizer was constructed and sent to the area. The seed belonged to a number of different individuals and firms, and while the bulk of it was more or less concentrated, it was necessary to bring the seed to the machine from some 40 different locations. An accurate record was kept of the heat of the seed as it was run through the machine. Approximately 90,000 pounds of seed were sterilized. Germination tests were later made, and they showed that the sterilized seed had slightly better germinating qualities than did the unsterilized seed.

As a result of the survey made in the fall, it was found possible to eliminate the wild cotton from southern Florida and the adjacent islands. This work was begun early in the calendar year 1933. By the end of June, all the cotton on the west coast from Naples northward had been destroyed, thus widening the gap between the wild cotton and domestic plantings by fully 150 miles, making the total distance about 300 miles. The wild cotton on the east coast was also destroyed, but a considerable amount still remains on the islands in Florida Bay and on Cape Sable. None of the cotton on Cape Sable can be reached until the next dry season.

During this eradication campaign over 625,000 mature, 816,000 seedling, and 19,000 sprout plants have been destroyed. By seedling plants is meant those up to the size of walking canes; mature plants are any plants larger than this. Some of the mature plants reach a height of 15 to 20 feet and are 5 or 6 inches in diameter, although the majority are not so large. Many wild and domestic cotton plants are grown in yards as ornamentals, and during the eradication work these have also been destroyed. After the danger was explained, all the owners, except 1 or 2, allowed such plants to be destroyed.

The eradication of the small, experimental plantings of cultivated and wild cotton at Chapman Field has been carried on in cooperation with the Bureau of Plant Industry. A few plants have been left in each of the plots so as to avoid any possibility of driving the pests to some other malvaceous plant. All the fruit was removed from the plants which were left, and throughout the year the blooms have been removed daily. These blooms were found to be infested during the summer of 1932, but from October 7 to March 3, 1933, the examinations were negative. During the period March 3 to 24, 1933, 11 pink-bollworm larvae were taken from blooms in one of the plots, but all examinations between then and the end of the fiscal year have been negative. This would apparently indicate that the light infestation was due to overwintering larvae in the soil and not to reinfestation from outside sources.

CLEAN-UP OF BIG BEND AREA OF TEXAS UNDERTAKEN

The Big Bend section of Texas is comprised of the counties of Brewster and Presidio, most of the cotton acreage being in Presidio. During the 1931 crop season the infestation was heavier than ever before, practically all bolls being infested before the end of the season, and the loss to farmers was exceedingly heavy. Early investigations indicated that the infestation would be even heavier during the 1932 crop season. Such intense infestation makes the prevention of spread by quarantine methods all the more difficult, and plans were accordingly made to try to reduce this infestation to insure that the quarantine would give the necessary protection to the Cotton Belt proper. The plans were to make a thorough clean-up of the fields after picking had been completed, have the farmers delay the planting date for the following crop, and make use of trap plots of cotton.

Complications, however, prevented these plans from being carried out in full detail. In the early part of September a flood came down the Conchos River of Mexico, which empties into the Rio Grande about 2 miles above Presidio. All the cotton acreage on the Mexican side of the river, and approximately 1,200 acres in Presidio County, were flooded. About 3 weeks later floods came down the Rio Grande and the Conchos River at the same time and covered practically all the cotton acreage of the Big Bend. This made the field clean-up much more difficult than it otherwise would have been. Silt was deposited about the fields which prevented the use of machinery; it was necessary, therefore, to cut the stalks with machetes and have the clean-up done by hand.

The work was begun early in November and completed the latter part of January. A total of 4,106 acres was cleaned at an average cost of \$4 per acre. There was considerable drift material along the river containing cotton which had been washed from the fields, and after the field clean-up was completed, this drift material was burned. Following this a house-to-house canvass was made, and all places where cotton had been stored were cleaned as were also all trucks and other vehicles which had been used to transport cotton. All seed cotton in mattresses and pillows was replaced with linters.

The peak of moth emergence in the Big Bend is completed by the latter part of May. Cotton planted after April 15 does not have blooms before the middle of June; therefore, all farmers were requested not to plant cotton before this date (April 15), so that the peak of moth emergence would be over before the cotton reached the point where the insect could be propagated. Every farmer willingly obeyed this request, as they were all familiar with the damage the pink bollworm could do.

In order to attract moths emerging later in the season early plots of cotton were planted in advance of the main crop to act as traps. This plan had worked out very well in the Salt River Valley of Arizona, where stub cotton could be used as a trap. Such stub cotton was not available in the Big Bend; therefore, it was necessary to plant cotton in hotbeds and later transfer it to the fields. After an early set-back from cold weather, this cotton began growing very nicely and had blooms about a month in advance of the main crop. A total of 67 plots, containing about 200 plants each, were set out, which gave an average of 1 plot to each 37.7 acres of cultivated cotton. The blooms from this cotton were collected daily, and after being inspected they were burned. The first infested blooms were collected early in June. By the end of the fiscal year infested blooms were being found in 47 of the 67 plots. A few blooms were beginning to appear in the commercial cotton fields, and infested blooms had been found in some 14 fields, but the pink-bollworm moths were clearly being attracted to the early cotton plots much more readily than to the cotton fields.

In connection with the work in the Big Bend, there was some apprehension that the two floods might have carried infested material down the river to points where cotton is grown, and thus spread infestation. Therefore, during the crest of the second flood, which was considerably higher than the first, inspectors of this project and of the port and border service, working in cooperation, were stationed on bridges and other points of vantage from Del Rio to Brownsville to make observations of the drift material carried by the river. In no case was any cotton debris seen. After the lowlands along the river had dried sufficiently, a thorough examination was made of the drift material from Eagle Pass northward for a distance of about 65 miles. Several cotton stalks, bolls, and small seedling plants were found near Eagle Pass; however, it later developed that this material undoubtedly originated from some 300 acres of cotton along the river in Mexico, above Eagle Pass, which had been flooded and some of the cotton washed away. No cotton debris of any kind was found above this point. After this work was completed a thorough inspection was made of all cotton fields within 5 miles of the Rio Grande from Laredo southward to Brownsville. All the inspections were negative. The evidence indicated that the floods did not carry infested material from the Big Bend to the cotton fields southeast of Laredo, a distance of over 500 miles.

SALT RIVER VALLEY

Intensive inspections were made during the year in the Salt River Valley where eradication measures have been under way. The inspection of squares and bolls was begun as soon as they were available in the spring of 1932, most attention being given to the Laveen and Goodyear areas in Maricopa County, where the only infestations found in the 1931 crop season were located. Field inspections were continued during the summer until the ginning season got under way, after which they were replaced by gin-trash inspection, six machines being operated during the peak of the ginning season. Practically all the available trash was inspected. Toward the close of the season, in the spring of 1933, field inspections were resumed, and a supply of bollies was also collected. Inspection of the bollies had not been completed by the end of the fiscal year; but the results of the inspections so far as they had been finished in the Salt River Valley were all negative, and it is hoped that the infestation in that valley may have been eradicated.

COMPENSATION CLAIM BOARD

The work of the Compensation Claim Board in connection with claims arising out of the 1930 noncotton zone in Arizona, authorized under the provisions of Public Resolution No. 42, approved February 8, 1930, which has been discussed in previous annual reports, was completed with the close of the fiscal year 1933. During this fiscal year awards were submitted by the Board on seven claims, on which payments were made totaling \$2,269.88.

At the close of June 30, 1933, the Federal Government had paid 945 claims, representing 39,519.3 acres, in the total amount of \$635,982.10, which included \$14,304.12 paid on the claims of Indian farmers. The total amount paid, deducted from the original appropriation of \$675,000, left an unobligated balance of \$39,017.90 which reverted to the general funds of the United States Treasury at the close of the fiscal year.

Under the provisions of the said public resolution these claims were paid by the Federal Government on the agreement by the State of Arizona, except as to Indian claims, to reimburse the United States Treasury in one half of the amounts so expended, or the sum total of \$310,838.99. Of this amount the State has paid \$309,704.05, leaving a balance due the Federal Government of \$1,134.94, not including interest, pending payment at the close of the fiscal year.

A complete statement of Federal payments, State reimbursements, and net costs of claims arising out of the noncotton zone of 1930 is given in table 5.

TABLE 5.—*Federal expenditures and State reimbursements on claims arising out of the noncotton zone of 1930 in Arizona*

Item	Total claims	Total acreage	Payments	Total payments
	<i>Number</i>	<i>Acres</i>	<i>Dollars</i>	<i>Dollars</i>
Federal payments—				
To Indian farmers.....	100	756	14,304.12	
To white farmers.....	845	38,763.3	621,677.98	635,982.10
Reimbursements by the State of Arizona to the Federal Treasury:				
Fiscal year 1932.....			¹ 163,750.00	
Fiscal year 1933.....			¹ 145,954.05	
Fiscal year 1933, payment pending.....			¹ 1,134.94	310,838.99
Net cost to Federal Government of noncotton zone claims.....				325,143.11

¹ Amount represents principal and does not include interest on overdue payments.

SITUATION IN OTHER INFESTED AREAS

Intensive gin-trash inspections were carried on in the Midland, Tex., district during the season, two machines being operated at the peak of the ginning operations. In addition, field inspection was performed in Ector and Andrews Counties, where the cotton acreage is too small to support a gin. A supply of bollies was also collected, and the examination of these has already been completed. All results in the Midland district were negative. In the remaining districts only enough gin-trash inspection was performed to obtain accurate information as to the degree of infestation. It was found that the infestation in El Paso County was heavier than ever before, but in the remaining districts it was lighter. Hand inspection of gin trash in the Juarez Valley of Mexico, which is adjacent to the El Paso Valley, showed that infestation in this district was also heavier than last season. The number of bushels of gin trash inspected and the number of specimens collected in each of the districts under regulation are given in table 6.

TABLE 6.—*Summary of gin-trash inspection for the pink bollworm in regulated areas, crop season 1932*

District	Gin trash inspected	Pink bollworms collected	District	Gin trash inspected	Pink bollworms collected
	<i>Bushels</i>	<i>Number</i>		<i>Bushels</i>	<i>Number</i>
Midland, Tex.....	3,426	0	Duncan Valley, Ariz. and N.Mex.....	73	0
Pecos Valley, N.Mex.....	1,505	16	Safford Valley, Ariz.....	1,621	2
Pecos Valley, Tex.....	936	75	Salt River Valley, Ariz.....	60,454	0
Big Bend, Tex.....	34	47,602	Tucson, Ariz.....	80	0
Hudspeth County, Tex. (southeastern part).....	142	1,926	Northern Florida.....	352	2
El Paso Valley, Tex.....	525	1,207	Total.....	70,933	50,947
Mesilla Valley, Tex. and N.Mex.....	1,749	115			
Tularosa, N.Mex.....	36	2	Juarez Valley, Mexico.....	71	2,010
Deming, N.Mex.....	0	0			

INSPECTIONS OUTSIDE OF REGULATED AREAS

During the two previous crop seasons, inspections in States east of the Mississippi River have been limited to laboratory inspection of green bolls. The finding of pink-bollworm infestation on wild cotton in southern Florida, previously mentioned, made it necessary to do more thorough scouting in these States, and a separate inspector was accordingly stationed in Alabama, Georgia, and Mississippi, and one inspector for North Carolina and South Carolina combined. In addition to gin-trash inspection, these men collected green bolls and bollies for laboratory inspection and did a small amount of field inspection. In addition to these States, gin-trash inspections were also made in Arkansas, Louisiana, Tennessee, Oklahoma, Texas, Arizona, and California. A machine was also operated

at Mexicali, Lower California, about 2½ months. A total of 89,406 bushels of gin trash was inspected outside of the regulated areas, the results all being negative. It takes approximately 10 acres to produce a bushel of gin trash; therefore the number of bushels examined would represent the inspection of 894,060 acres. The number of bushels of gin trash inspected in each State is shown in table 7.

TABLE 7.—*Summary of gin-trash inspection for the pink bollworm outside regulated areas, crop season 1932*

State	Gin trash inspected	State	Gin trash inspected	State	Gin trash inspected
	<i>Bushels</i>		<i>Bushels</i>		<i>Bushels</i>
Alabama.....	2,975	Louisiana.....	3,362	Texas.....	37,629
Arizona.....	4,074	Mississippi.....	2,309	Lower California, Mexico.....	13,561
Arkansas.....	2,653	North Carolina.....	746		
California.....	7,760	Oklahoma.....	3,373	Total.....	89,406
Florida.....	2,460	South Carolina.....	1,951		
Georgia.....	5,524	Tennessee.....	1,029		

As in previous years, a quantity of green bolls was collected from the various cotton States, these collections being largely confined to areas where no other means of inspection were available. This season approximately 11,704 samples of 100 bolls each were collected; also, 1,405 bushels of bollies. The inspection of this material is now nearing completion. In addition, samples of cottonseed were collected from the Delta area of Mississippi, Arkansas, and southwestern Tennessee, where cotton production is extremely heavy and the amount of gin-trash inspection was not considered sufficient. These seed samples were collected late in the season from representative gins and oil mills, a total of 7,400 pounds being secured in 10-pound samples. The inspection of these samples is also nearing completion. The results of this inspection have been negative to date.

CHANGES IN REGULATIONS

There were three changes made in the pink-bollworm-quarantine regulations during the fiscal year 1933. The first change, effective September 15, 1932, released from the fumigation requirement cotton produced in Grant and Hidalgo Counties, N.Mex., and in Maricopa and Greenlee Counties, and those parts of Pinal and Graham Counties, Ariz., not under additional regulations on account of the *Thurberia* weevil.

The second change became effective October 29, 1932, under which the following counties in Florida were added to the regulated area: Alachua, Baker, Bradford, Columbia, Gilchrist, and Union.

The third change became effective on February 28, 1933. Under this change the following counties in Texas were released from the regulated area: Loving, Winkler, Andrews, Ector, Crane, Upton, and that part of Midland County which had been under regulation.

CONTROL MEASURES ENFORCED TO PREVENT SPREAD

The most important safeguards which have been in force for a number of years to control and prevent the spread of the pink bollworm from infested areas are (1) disposal of gin trash, (2) sterilization of seed, (3) supervision of oil mills, (4) fumigation and compression of lint, and (5) road-inspection stations.

Disposal of gin trash.—Gin trash is disposed of daily by burning, sterilization, or grinding, as many pink bollworms are discharged in this trash during the process of ginning. The State regulations of Texas and New Mexico require this daily disposal of trash up to December 1 of each year, the average killing-frost date being prior to this, after which the trash may be returned to farms for feeding, fertilizer, or other purposes. In areas where a killing frost has not occurred prior to this date, the ginners have always cooperated whole-heartedly in continuing the daily disposal of trash until there has been a killing frost.

Seed sterilization.—One of the most important and useful measures in preventing the spread of the pink bollworm is seed sterilization. All gins in the regulated area are equipped with sterilizers, whereby the seed is heated to a temperature of 145° F. as a continuous process during ginning, the sterilizers being equipped with thermographs so that the temperature of the seed is recorded

at all times. Prior to the 1932 ginning season a survey was made of all sterilizer equipment and any serious defects corrected, so that seed sterilization was more efficient last season than ever before. A new method of installing the thermograph bulb was worked out by the Technological Division of the Bureau, and was in use at many of the gins. Practically all of the remaining ginners expect to make the installation before the next season, as it gives a more accurate reading and also results in considerable saving in fuel to the ginners. During the 1932 crop season, 126 machines were operated, and they handled approximately 80,541 tons of seed.

Supervision of oil mills.—The lack of oil mills in certain parts of the regulated areas makes it necessary to authorize mills outside, but close to such areas, to handle quarantined seed. This season the mills at Colorado and Sweetwater, Tex., were again designated, and after a regulated area was established in northern Florida, mills at Tifton, Camilla, and Valdosta, Ga., were designated. The seed is hauled to the mills in sealed cars and segregated until crushed, the cars being thoroughly cleaned before being released. The seed is required to be crushed in such manner as to destroy the pink bollworm and, to prevent contamination, finished products are required to be segregated until treated in accordance with the regulations. Approximately 80,000 tons of seed were crushed at the 20 mills operating this season. A number of mills are equipped with the roller system for treating second-cut or mill-run linters, 8,752 bales being so treated.

Fumigation and compression.—Fumigation plants were operated at Alpine and El Paso, Tex., and Tucson and Phoenix, Ariz. The plant at Phoenix operated only a short time, as that area was released from the fumigation requirement early in the season. The greater part of the regulated area is now designated as lightly infested, so that only 7,150 bales of lint and 1,727 bales of linters were fumigated during the season. In addition, 212 bales of linters from the Juarez Valley of Mexico were imported and fumigated at El Paso, Tex. At the 5 compression plants operated, 122,221 bales of lint and 2,684 bales of linters were compressed during the season.

Road stations.—Road-inspection stations were operated at Alpine, Fort Davis, and Van Horn, Tex., and Las Cruces, N.Mex. The station was at first operated at Las Cruces as a further protection against the eastward movement of infested material from regulated areas of Arizona. After the fumigation requirement was removed from these areas it was not felt that this station was warranted, therefore it was discontinued on September 15, 1932. The three stations in Texas were established as a protection against the movement of infested material from the Big Bend area. After the clean-up was completed in the Big Bend, there was no material left which might spread infestation, therefore these three stations were discontinued on January 31, 1933. During the period the stations were in operation 36,307 automobiles were inspected, and 286 articles were confiscated. The material confiscated consisted of 172 lots of cottonseed, lint, or seed cotton, 5 cotton plants containing bolls, 5 cotton-picking sacks, 69 quilts, pillows, or mattresses, made of seed cotton, and 10 miscellaneous articles. In addition, 185 cotton-picking sacks were treated and passed, and 18 automobiles, trucks, and trailers were cleaned before being allowed to pass the station. Three of the confiscated articles were found to be infested with the pink bollworm, 14 living and 14 dead larvae being taken. It is of interest to note that the live specimens were found in seed cotton, while the dead specimens were found in cottonseed which had been sterilized.

Cooperation with Mexico.—In previous years some of the cotton produced in the Juarez Valley of Mexico, which is immediately adjacent to the El Paso Valley of Texas, has been imported into the United States. In order to facilitate the issuance of permits, gins in this area are equipped with seed sterilizers and are operated under the direct supervision of inspectors of this project. The two oil mills in that area are also operated under direct supervision, and as all the seed is sterilized, cake and meal produced at these mills are allowed entry into the United States under permit. The Mexican authorities and citizens involved have always given the best of cooperation in carrying on these activities.

THURBERIA WEEVIL

The principal characteristics of the *Thurberia* weevil and its importance have been fully discussed in previous reports. The area infested by this insect is the Santa Cruz Valley in Pima County, Ariz. The cotton acreage has decreased, due principally to the difficulty in obtaining water for irrigation, until there are now only some 800 acres in cultivated cotton. Field inspections were made

earlier in the season, and after ginning began the inspection work was confined to the examination of gin trash. One gin was sufficient to take care of the acreage planted, and as a result there was not sufficient trash available to justify the operation of a machine. Therefore, the inspection of such trash was all done by hand, and it was possible to inspect practically all the trash produced. No specimens of either the *Thurberia* weevil or the pink bollworm were found in the gin trash. On January 13, 1933, specimens of the *Thurberia* weevil were found while a field near Marana was being inspected. Later, inspections in this same field resulted in the finding of additional specimens, a total of 65 being found during the period January 13 to 25. The inspection of all other fields in the area was negative. A supply of bollies was collected and is now being inspected, no additional specimens having been found in any of the material examined to date. Specimens were found in two fields near Eloy, in Pinal County, last season. Intensive inspections in this area during the present season have all been negative.

The same safeguards used in controlling the pink bollworm are also used against the *Thurberia* weevil. These include the disposal of gin trash, sterilization of seed, compression and vacuum fumigation of lint, and clean-up of gins, oil mills, etc., at the close of the season's operations. The results of each of the above activities are included in the figures given for the pink bollworm.

MEXICAN FRUIT FLY

INFESTATIONS IN TEXAS

The most important development in the Mexican fruit fly eradication program in the lower Rio Grande Valley of Texas was the remarkable decrease in the number of fruit flies taken during the fiscal year, following the intensive suppressive measures carried out the previous season. A total of 2,396 specimens of fruit flies had been taken from 61 groves during the winter and spring of 1932. Despite the intensive inspections carried on during the past season, no larvae could be found in valley fruit and only six adult flies were caught in the traps. Of these, 3 were taken in January and 1 each in March, April, and May. Four of these adults were trapped in Hidalgo and two in Cameron County. None was taken in Willacy County. Only one of these groves, that of the Texas Agricultural Experiment Station at Weslaco, was found infested in the fiscal year 1932.

A number of factors contributed to this decrease in the fly population of the valley. The bearing trees of the quarantined counties were sprayed in July 1932 and again in August with a nicotine-molasses spray. The thorough cleaning of all groves at the opening of the host-free period was undoubtedly effective in reducing the number of flies in the orchards. The temperature from September through December was about 5° F. lower than during the same period of 1932, and this probably aided in retarding to some extent the development of the various stages of the fly. The price of fruit was considerably better than during the preceding year, resulting in much of the crop being harvested early in the season. This, together with the short crop produced, materially reduced the amount of cull or dropped fruit in groves and made possible the maintenance of very effective grove sanitation, thus reducing to a minimum the possibilities of increase from any flies which might have survived the host-free period and spraying operations.

OTHER ANASTREPHA

The operation of traps resulted in the recovery during the year of a number of other species of the fruit-fly genus *Anastrepha* on the Texas side of the Rio Grande, including 97 *A. pallens*, 2 *A. fraterculus*, and 1 *A. serpentina*, in addition to the 6 *A. ludens*. The details are shown in table 8.

The taking of the *Anastrepha serpentina* was of considerable interest since, so far as is known, this was the first specimen of this species of fruit fly ever found in continental United States. The two specimens of *A. fraterculus* were collected in the Harlingen and Weslaco districts. One adult of this species had previously been trapped in the spring of 1932 in the Donna district. No explanation is available to account for the presence of these species in valley groves.

Anastrepha pallens, which is not known to attack commercial fruit, was found in fewer numbers, both in the citrus groves and in *Bumelia angustifolia*, the native host plant, than in the fiscal year 1932.

TABLE 8.—*Infestations of fruit flies in Texas, fiscal year 1933*

Date trapped	District	Adults		Date trapped	District	Adults	
		Males ¹	Fe- males			Males ¹	Fe- males
Jan. 14.....	McAllen.....	1	-----	Apr. 3.....	Harlingen.....	-----	² 1
Jan. 14.....	Weslaco.....	-----	² 1	Apr. 12.....	do.....	1	-----
Jan. 21.....	McAllen.....	1	-----	May 1.....	Mission.....	1	-----
Jan. 24.....	Weslaco.....	1	-----	Total.....	-----	1 6	3
Feb. 24.....	Harlingen.....	-----	³ 1				
Mar. 10.....	do.....	1	-----				

¹ All 6 males were *Anastrepha ludens*; 43 other specimens of this species were taken in Matamoras, Mexico, as shown in table 11. *Anastrepha pallens* is not known to attack commercial fruit and is therefore omitted from both tables.

² *Anastrepha fraterculus*.

³ *Anastrepha serpentina*.

Also of incidental interest was the taking of an adult papaya fruit fly, *Toxotrypana curvicauda*, in the Weslaco district. This is the second of this species observed in the valley, the first having been taken in this same district during the previous year.

INSPECTIONS

Because of the light crop and curtailed harvesting season the number of grove inspections required during the past year was considerably less than during the preceding season. A total of 30,957 inspections were made; of these it was necessary temporarily to withhold only 740 certificates of inspection, which indicates that groves were kept in excellent condition throughout the harvesting period.

In addition to the regular grove inspections, which were made for the purpose of locating infestations and enforcing sanitary conditions, trapping was carried on throughout the year. During the harvesting period approximately 1,200 fly-traps were operated regularly on the Texas side of the border. This number was increased to about 6,000 during the host-free period.

COLLECTION OF SPECIMENS

Invaluable experience in the most effective methods of inspection was gained by all inspectors during the spring of 1932 when infestations were generally distributed over the valley. Based on this experience, inspections during the last season were confined largely to apparently sound fruit, since experience had shown that larvae of *Anastrepha ludens* were more likely to be found in that class of fruit than in decaying fruit, in which scavenger larvae are most common. For that reason the number of collections and specimens submitted for identification showed a decided decline from the number of the previous year. A total of 3,388 collections were made, comprising 18,349 specimens. Larvae of 10 families of Diptera were commonly encountered in decaying fruit.

ERADICATION MEASURES

It was not deemed necessary or advisable to declare infested zones around the six groves in which adult fruit flies were taken this year. The commercial crop of fruit had been completely harvested in 1 and partly harvested in the other 2 groves in which adults were taken during January. The owners of these groves were notified of the taking of the adult flies, and they immediately completed the harvesting of all remaining commercial fruit and cleaned the trees of all culls. This was followed by a thorough application of the nicotine spray, which was applied under the direct supervision of the district inspectors. There was, of course, no fruit in the groves in which adult flies were found subsequent to March 1. These groves were also given an especially thorough application of the spray during the regular spraying program in the spring of 1933.

HOST-FREE PERIOD

On account of the light crop of fruit produced, there was little or no demand for an extension of the harvesting period, which ended March 1. As in previous years, in order to expedite the work and to make the host-free period effective over as long a period as possible, laborers were employed to examine, under direct supervision of the inspectors, all bearing trees of the valley. The work was particularly difficult this season on account of the unusual amount of "off-bloom" fruit which the trees were carrying. In many of the groves a complete crop of this fruit was present on the trees. This condition was the result of a severe frost in March 1932, when the trees were in full bloom, and the lack of irrigation during the ensuing summer months. It was found that the great majority of growers had made an earnest effort to remove this fruit, but a considerable amount had been overlooked, which it was necessary to have removed by the laborers. This was to be expected in view of the large amount present and the difficulty of distinguishing the green fruit from the leaves. Very little complaint was voiced by the growers on being required to remove the October-bloom fruit, but a number objected strongly to removing fruit which would have ripened in from 4 to 6 weeks.

The tree-to-tree inspection was completed in about 15 days.

ELIMINATION OF ALTERNATE HOST-FRUIT TREES

A total of 308 alternate host-fruit trees were destroyed during the fiscal year. These included 175 guava, 92 peach, 34 plum, 4 pear, and 3 apple trees. The great majority were seedlings which had come up from carelessly tossed out seed. A number of the old trees which the owners had consistently refused to take out died of root rot. A total of 40,293 of such alternate host trees have been voluntarily destroyed by the owners since the quarantine was inaugurated in 1927.

POISON SPRAY

In order to supplement the host-free-period requirement as an eradication measure, arrangements were completed during the last months of the fiscal year 1932 to spray the bearing trees of the quarantined area with a solution of nicotine sulphate and blackstrap molasses. The formula used had been worked out by the Bureau of Entomology, and consisted of 1 gallon of 40-percent nicotine sulphate and 20 gallons of molasses in 179 gallons of water. The first application of this spray was started early in July and was completed in about a month. The poison was applied to 3,645,034 trees on 11,841 premises during the first application. A total of 18,779 gallons of molasses and 940 gallons of nicotine sulphate were required for this application.

The second application was started on August 15. Several changes were made in the methods of distribution of the material which allowed the work to proceed much more rapidly than in the first application. The spraying was completed by the 1st of September, with the exception of a number of groves which were too wet to work. Some 390,000 less trees were sprayed in the second application than in the first. These were young trees in isolated developments which experience had shown were unlikely to be infested. A total of 3,255,480 trees on 11,644 premises were sprayed during the second application. This required 17,053 gallons of molasses and 854 gallons of nicotine sulphate.

A third application of spray was given to the groves which were found infested in the spring of 1932 and the groves adjoining these. This work was conducted by the Texas State Department of Agriculture in the late fall and was completed in January 1933. A total of 106 groves containing 81,631 trees were sprayed. For this work 720 gallons of molasses and 36 gallons of nicotine sulphate were required.

Intensive inspection and the operation of traps resulted in the taking of only six adult fruit flies during the winter and spring months of 1933. This was a marked decrease as compared to the 2,396 specimens collected during the same period of the preceding year. The application of nicotine-molasses spray, started in the summer of 1932, was accordingly continued as an additional eradication measure, and enough material was purchased and forwarded to the valley to allow three applications of the poison spray to the bearing trees in the spring of 1933.

The actual spraying operations of the first application of the 1933 season were started during the last days of March and were completed near the end of April.

There were sprayed, during this application, 4,460,202 trees on 13,867 premises. The material used amounted to 23,520 gallons of molasses and 1,176 gallons of nicotine sulphate. Weather conditions as regards rainfall were ideal throughout and following the application.

The second application was started May 22 and was practically completed by June 21. A number of young trees in isolated locations were omitted in the second application, leaving only 3,875,075 trees on 13,040 premises which were sprayed. In the second application, 21,239 gallons of molasses and 1,060 gallons of nicotine sulphate were used.

Because of the abnormally dry conditions prevailing during the spring and early summer of 1933 when the two applications of spray were made, and since traps operated throughout the valley after May 1 had given negative results, the remaining material was reserved for use in the event that infestations should become established in the future.

Approximately 500 knapsack sprayers were used in applying the poison spray. These sprayers were furnished by the State of Texas and the three counties involved. City governments, civic organizations, and individuals assisted in the work by furnishing labor, storage space, and miscellaneous supplies. Without the excellent cooperation of the industry as a whole, the 100 percent coverage of the producing trees of the quarantined area would have been impossible. Even with the assistance rendered by the various organizations, the absentee-owned and abandoned groves constituted a most difficult problem to handle, and the complete coverage of bearing trees was possible only because of the resourcefulness and ingenuity exhibited by the district inspectors.

Details of the spraying activities are given in table 9.

TABLE 9.—*Summary of spraying operations, fiscal year 1933*

County and application	Properties sprayed			Trees sprayed	Material used	
	Com- mer- cial	Non- com- mer- cial	Total		Mo- lasses	Nico- tine sul- phate
Hidalgo:	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Gallons</i>	<i>Gallons</i>
First application, July 1932.....	3,868	2,239	6,107	2,311,769	11,577	580
Second application, August 1932.....	3,578	2,298	5,876	2,034,125	10,566	528
Third application, April 1933.....	5,179	2,310	7,489	2,876,981	14,808	740
Fourth application, June 1933.....	4,446	2,341	6,787	2,521,683	13,468	671
Cameron:						
First application, July 1932.....	2,585	2,902	5,487	1,286,787	7,016	351
Second application, August 1932.....	2,579	2,943	5,522	1,176,032	6,309	317
Third application, April 1933.....	3,164	2,808	5,972	1,498,066	8,269	413
Fourth application, June 1933.....	2,913	2,746	5,659	1,292,198	7,513	376
Willacy:						
First application, July 1932.....	149	98	247	46,478	185	9
Second application, August 1932.....	141	105	246	45,323	178	9
Third application, April 1933.....	179	227	406	85,155	442	22
Fourth application, June 1933.....	132	92	224	61,194	258	13
Special application (Hidalgo and Cameron Coun- ties), winter 1932.....	106	-----	106	81,631	720	36
Total.....	29,019	21,109	50,128	15,317,422	81,309	4,065

CERTIFICATION OF FRUIT

Several million permit tags are required each season to certify the fruit moving out of the quarantined area. To avoid difficulties in keeping an accurate check on the use of these permit tags, a system of requiring a master permit to accompany each commercial shipment of six or more packages of fruit was instituted at the beginning of the shipping season last fall. These master permits were issued by the inspectors upon exhibition of a bill of sale by the trucker covering the fruit in the load, upon request of the grove owner making the sale, or to cover the movement of fruit from approved packing houses. By this method the inspectors were enabled to identify the groves in which all fruit leaving the quarantined area originated. These permits were issued when the load was ready for shipment regardless of the hour of day or night. Many were issued after office hours and on holidays.

Total shipments equivalent to 4,661 carloads were certified during the season. Approximately 32 percent of this fruit was moved by truck. While the majority of truck shipments went to Texas points and were certified under the State regulations, 1,816 master permits were issued for shipments by road vehicles destined to 24 other States and the District of Columbia. In addition, many out-of-state truckers secured loads of valley fruit in the markets of San Antonio, Dallas, Houston, and other Texas cities.

ROAD TRAFFIC INSPECTION

Traffic-inspection stations were maintained on the two highways leading out of the valley from the first of November to the first of March. As will be seen from table 10, a total of 38,839 vehicles were inspected of which 14,071 were carrying fruit. Of the latter, 1,390 were transporting fruit in violation of the State or Federal regulations. These tourists were given the option of returning the fruit to the valley for proper certification, or of having it destroyed at the stations. Only two complaints were registered during the year by travelers who were required to destroy the fruit they were carrying.

TABLE 10.—Road traffic inspection, fiscal year 1933

Month	Total vehicles		Vehicles having properly packed and tagged fruit		Vehicles having contraband fruit		Packages of fruit passed in—		Packages destroyed	Packages returned to area		
	In-spected	Having fruit	Trucks	Passenger autos	Trucks	Passenger autos	Trucks	Passenger autos	Boxes ¹	Boxes	Bushels	Sacks
November...	7,025	2,303	1,151	887	² 6	265	121,756	1,634	22¼	-----	35	-----
December...	9,654	4,121	1,917	1,889	² 12	312	160,878	4,107	49	2¾	21½	5
January.....	11,392	4,103	2,072	1,550	1	480	186,706	2,935	60¾	-----	25½	-----
February....	10,768	3,544	1,946	1,284	-----	314	169,002	2,728	44	-----	3¾	-----
Total....	38,839	14,071	7,086	5,610	19	1,371	638,342	11,404	176	2¾	85¾	5

¹ Field box equivalent to 1 bushel.

² Part of load O.K.

The ranch roads leading out of the valley to the northwest were patrolled during December. No fruit was observed moving out of the valley by these routes.

CENSUS OF FRUIT TREES

For administrative reasons it is necessary to know the number of trees coming into bearing from year to year over which it will be necessary to maintain supervision. Such information is gathered each spring by the various district inspectors. This census shows that 540,740 citrus trees were planted in orchard form, between April 1, 1932, and March 31, 1933, bringing the total number of citrus trees in the quarantined area to 8,404,740. Of the new trees planted, 427,153, or 79 percent, were grapefruit; 105,291, or 19 percent, were oranges, and 8,296, or 2 percent, were miscellaneous citrus. Of the citrus trees in orchard form 4,813,640, or 57 percent, are of bearing age.

Most of the trees planted during the past year were set out by individuals rather than by development companies as has been the case in previous seasons. Individual growers took advantage of the low price of trees to round out their plantings, while the general economic conditions in the country deterred the land companies from expanding their holdings.

VIOLATIONS

About the usual number of minor infractions of the Federal regulations was encountered during the season, but none of them could be considered willful or deliberate.

Of a more serious nature was the refusal of a number of growers in the Lyford community in Willacy County to clean the ripe and offbloom fruit from their trees at the opening of the host-free period prescribed under State law. The plantings in this community are of the back-yard type from which very little, if

any, fruit is handled commercially. The owners of these trees conceived the idea that the only penalty for allowing the fruit to mature during the summer months would be a refusal of shipping permits, which would be no hardship to them. After persuasive methods had failed, the case was turned over to the State department of agriculture for legal action. The fruit on two of these places was officially condemned as a public nuisance by the commissioner of agriculture and was destroyed by laborers under the protection of the sheriff's office of Willacy County. The owners of the other four premises, on seeing the determined action of the State officers, allowed their fruit to be removed without further objection.

INFESTATIONS IN MATAMOROS, MEXICO

The work of the Mexican Department of Agriculture in suppressing infestations at Matamoros and attempting to prevent the introduction and sale of infested fruits from other parts of the Republic is helping greatly to prevent the reintroduction of the Mexican fruit fly into the citrus-growing area on the Texas side of the border.

All citrus and other fruits arriving in Matamoros from interior points are inspected on arrival before being released to the consignees. Following such release, all fruit that shows signs of decay or infestation is collected daily from the markets and after inspection is destroyed by burning. Inspection of fruit on arrival in Matamoros and of that spoiling in the markets resulted in the finding of 6,654 larvae and 33 pupae during the year. These specimens were taken from apples, guavas, mangoes, oranges, quinces, and from the box used in transporting spoiled fruit from the market to the office of the Mexican inspector. As in previous years, mangoes were found to carry the heaviest infestation of any fruit reaching Matamoros. Some wormy fruit is undoubtedly sold to the citizens before any external evidence of infestation is apparent. When the purchaser later finds this fruit wormy, it is, in many instances, thrown out in the patio, which accounts for the continued taking of adult fruit flies in Matamoros.

Approximately 200 flytraps were operated continuously during the year in Matamoros. These traps captured 43 adult fruit flies on 12 premises. This was about half the number taken during the preceding year.

As a result of these activities, the development of local infestation in Matamoros is largely prevented. Only three such local infestations were discovered during the year. These were found in July and October 1932, and April 1933, respectively. The facts indicated that a single female, in all probability, was responsible for each of these infestations, these females having evidently escaped the traps and poison spray until after they had laid eggs.

TABLE 11.—Infestations of *Anastrepha ludens* in Matamoros, Tamaulipas, Mexico, fiscal year 1933

Month	Local fruit			Imported fruit							Total
	Adults trapped	Larvae found in—		Larvae found in—						Pupae in mango	
		Orange, sour	Sar-gentia	Apple	Guava	Mango	Orange	Quince	Un-known ¹		
July.....	2	169				37	6				214
August.....	1			² 1			1	² 6			9
September.....				4			21	2	2		29
October.....	22	5									27
November.....	3						3				6
December.....							67				67
January.....							3				3
February.....					³ 9	15					24
March.....	1					58	1				60
April.....	11					337	6				354
May.....			11			891	3				905
June.....	3					5,181				33	5,217
Total.....	43	174	11	5	9	6,519	111	8	2	33	⁴ 6,915

¹ Specimens taken from box in which fruit was carried from market to office.
² *Anastrepha* species—not typical *A. ludens*.
³ Probably *A. striata*.
⁴ 2,521 of these specimens were forwarded to Mexico City for identification.

Eradication measures were promptly undertaken not only with respect to the three instances in which larval fruit flies were captured in local fruit but also in every case in which adult fruit flies were caught in the traps. All fruit trees within the four blocks surrounding each of the infested premises were sprayed with the same materials used in the case of similar outbreaks in the Texas area. In addition, two city-wide applications of the spray were made subsequent to the arrival of shipments of heavily infested fruits on the markets. Following the finding of larval infestations all fruit was stripped from the trees on the infested premises and, after being carefully examined, was destroyed by burial. The trees on these premises were given an additional application of the spray. Infestations did not develop to an extent necessitating a city-wide host-free period.

The careful and systematic collection and destruction of infested fruit reaching the city from the interior of Mexico reduce to a considerable extent the chances of an infestation's becoming established. This risk is still further reduced by the operations of the flytraps, in which many adult flies are caught before their eggs have had an opportunity to develop.

The fruit-fly findings in Matamoros are shown in detail in table 11.

DATE-SCALE ERADICATION

Systematic inspection was continued in the date-growing areas of Arizona and California. Careful scouting for unlisted palms was also continued. Several small abandoned date plantings of no value were dug out and destroyed, and previously cleaned acreage was checked for volunteer plants and parts of stumps. The details are given in table 12.

COACHELLA VALLEY

During the past year 123,759 palm inspections were made in the Coachella Valley. No *Parlatoria* scale was found. This is the first year since the beginning of the project that scale has not been found, and is the second successive year in which no new infestation has been discovered. There were dug out and destroyed during the year 775 date palms of no value, many of which had previously been infested, and 219 previously infested palms were stripped of fiber to examine the leaf bases for scale.

TABLE 12.—*Palm inspection and treatment, date-scale eradication project, fiscal year 1933*

Item	Arizona		California		Total
	Phoenix district	Yuma district	Coachella Valley district	Imperial Valley district	
Palm inspections.....	41, 242	2, 376	123, 759	43, 347	210, 724
New infested properties.....	0	0	0	0	0
Total infested properties.....	1	0	0	4	5
Date palms infested.....	1	0	0	2	3
Canary Island palms infested.....	0	0	0	5	5
Total.....	1	0	0	7	8
Treatment:					
Dug out and destroyed.....	1	0	0	1	2
Defoliated and sprayed.....	0	0	0	6	6
Total.....	1	0	0	7	8
Valueless palms dug out in infested areas; not included above.....	0	0	775	95	870

IMPERIAL VALLEY

In the Imperial Valley, 43,347 palm inspections were made during the year. Two infested date palms were found on 2 properties—both old infestations—as compared with 14 infested date palms on 7 properties—4 old and 3 new infestations—found during the fiscal year 1932. In addition to the 2 infested date palms found in the fiscal year 1933, 5 Canary Island palms were found infested

as compared with 33 Canary Island and 10 fan palms found infested in 1932. A total of 7 infested palms was thus found on 4 properties in this valley in 1933, as compared with 57 infested palms on 11 properties in 1932. Six new infestations were found in 1932, and none in 1933. Careful scouting was carried on in 233 sections to locate unlisted palms. A number of small date palms, one infested, noted above, were discovered. Ninety-five date palms on infested properties were dug out and destroyed.

PHOENIX DISTRICT

In the Salt River Valley of Arizona, 41,242 palm inspections were made and 1 infested palm was found on a previously infested property. The palm was dug out and destroyed. This is the only infested palm found in Arizona during the past 2 years. Scouting for unlisted palms was continued and 413¼ sections covered.

YUMA DISTRICT

In the city of Yuma and vicinity, 2,376 palm inspections were made and no scale found.

MODIFICATION OF QUARANTINE

Effective December 1, 1932, the quarantine was amended by removing the *Phoenicococcus* scale (*Phoenicococcus marlatti*) from consideration, as it was found that this insect is not serious commercially. Evidence of freedom from the *Parlatoria* scale now constitutes the basis for issuing Federal permits for the shipment or transportation of date palms or date-palm offshoots from the regulated areas; namely, Imperial County and that part of Riverside County lying east of the San Bernardino meridian in California; Yuma, Maricopa, and Pinal Counties in Arizona; and Webb County in Texas.

QUARANTINE ON DOMESTIC NARCISSUS

During the past year, special attention has been given to increasing the efficiency of bulb inspection and treatment methods. Under a reorganized plan of cooperation with the Bureaus of Plant Industry and Entomology, progress was made in the development of the vapor-heat treatment, and on June 26, 1933, that method was authorized as a basis for narcissus treatment to eliminate greater bulb flies. Vapor heat has also been found very effective as an eelworm control, and experiments are now being carried on to determine whether it can be relied on to eliminate the nematodes entirely, without injuring the bulbs.

Difficulties in obtaining satisfactory results from the hot-water treatment have also been the subject of investigation, and certain modifications in tank design and equipment have been devised to increase the agitation of the water and thereby bring about a higher eelworm mortality through better heat distribution.

The treatment and inspection instructions issued in June 1932 have been consistently adopted by the State inspectors carrying out the field and warehouse bulb examinations, and this has increased uniformity of action in the different bulb-growing areas. A number of conferences were held with growers and inspectors in nearly all the leading narcissus-producing sections during the year, and differences in methods and interpretations were cleared up. Among other questions, the problem of handling large blocks of bulbs which show very slight and recent eelworm infestations was intensively studied, and instructions have been issued specifying the conditions under which parts of some such blocks may be certified as free from infestation.

For the season of 1932 the State nursery inspectors of the various States reported to the Bureau the inspection of 302,323,265 narcissus bulbs grown in 29 States and the District of Columbia. This represents a decrease of 71,942,429 bulbs under the figures for the previous year. Of the total, 169,815,503 consisted of Paper White and other polyanthus types of bulbs grown in the Southern States, and 132,507,762 consisted of bulbs of the hardy daffodil types grown in the North. Of the polyanthus types, 148,736,581 were reported as being certified as uninfested and eligible for shipment without treatment, while 2,188,109 were either fumigated or given the hot-water treatment and certified for shipment on that basis. Of the daffodil types, 19,629,551 were certified as uninfested, and shipment without treatment was authorized, and 84,580,213 were either fumigated or given the hot-water treatment, and certified on that basis.

Infestations with eelworms (*Tylenchus dipsaci*) were reported in 1932 in one or more plantings in California, Florida, Georgia, Maryland, Michigan, Missouri, New Jersey, New York, North Carolina, Ohio, Oregon, Tennessee, Virginia, and Washington. In addition to the records for 1932, this species had previously been reported in narcissus plantings in Alabama, Illinois, Indiana, Kansas, Kentucky, Mississippi, Rhode Island, Utah, and Wisconsin. Some of these plantings have not since been reported as inspected, and infestation may possibly be persisting in them.

Greater bulb flies (*Merodon equestris*) were reported in California, Michigan, New York, North Carolina, Oregon, Pennsylvania, Rhode Island, Virginia, and Washington. They have also been reported in previous years in narcissus plantings in Illinois, Ohio, and Utah.

The lesser bulb flies (*Eumerus* spp.) were removed from consideration under the Federal narcissus-bulb quarantine in an amendment which became effective on June 20, 1932. Accordingly, most of the State inspectors did not report the presence or absence of the lesser flies in 1932.

Detailed information on the numbers of plantings and bulbs and the extent of treatment in the individual States and the District of Columbia is given in Circular B.P.Q.—349, issued on February 17, 1933.

BLACK-STEM RUST QUARANTINE

The quarantine on account of black-stem rust (*Puccinia graminis*), under which Federal permits are required for all shipments of barberry and mahonia plants (except *Berberis thunbergii* and its rust-immune varieties) consigned into or between 13 of the North Central States, is designed to assist those States in protecting grain from black-stem rust infection.

In cooperation with the Bureau of Plant Industry, the premises of some 30 applicants for permits were inspected, and permits were issued to 25 firms, an increase of 5 over the previous year. Sixteen violations of this quarantine were intercepted at transit-inspection points during the year.

According to the Bureau of Plant Industry, the protected States, which have been engaged for a number of years in a barberry-eradication campaign, destroyed in cooperation with that Bureau 175,951 barberry bushes, seedlings, and sprouts during the calendar year 1932, making a total of 18,665,403 since the campaign was started in the spring of 1918. The States in which this work is being carried on are Colorado, Illinois, Indiana, Iowa, Michigan, Minnesota, Montana, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin, and Wyoming.

PHONY-PEACH DISEASE QUARANTINE REVOKED

The phony-peach disease quarantine was revoked, effective March 1, 1933. When the quarantine was placed by the Department, effective June 1, 1929, it was believed as a result of surveys in 1926, 1927, and 1928, that the disease was confined to the States of Georgia and Alabama, although it was known to have been present in Georgia for some 50 years. Surveys during the next 2 years disclosed infections in Mississippi, Texas, Arkansas, Louisiana, Tennessee, North Carolina, and South Carolina. Surveys in 1931 showed further infections in Florida and Illinois. During 1932, infected trees were found in southern Oklahoma and in southeast Missouri. Scattered infections were also found during the year in new localities in Arkansas, Illinois, and Texas.

The widely separated infections in some of the States concerned have made the enforcement of intrastate quarantine regulations by these States impracticable, thereby complicating the problem of maintaining Federal control of interstate shipments, and this condition indicated that further control of spread could be handled more satisfactorily by improved and modified nursery-inspection methods in the various States than by enforcement of the type of Federal quarantine regulations previously in effect.

The investigations of the Bureau of Plant Industry point so strongly to the peach borer as the carrier of the disease, that the future activities of this Bureau with respect to phony-peach-disease control will be confined largely, insofar as funds and facilities permit, to assisting the States in the development and adoption of improved culling practices to eliminate all peach-borer infested or injured stock, and increasing the efficiency of inspection in peach-growing nurseries and the environs by directly aiding in such surveys.

The States of Arkansas, Delaware, Georgia, Mississippi, and Oklahoma promulgated State regulations directed against this disease after the Federal quarantine was taken off. Other interested States are handling the problem of prevent-

ing the spread of infection by administratively controlling it through the usual nursery-inspection organization in cooperation with this Bureau. Federal aid in bringing about the eradication of the disease is under the direction of the Bureau of Plant Industry.

Table 13 shows that 19 shipments moving in violation of the phony-peach disease quarantine were intercepted between July 1, 1932, and March 1, 1933, the date on which the quarantine was revoked.

WOODGATE-RUST QUARANTINE

The Woodgate-rust quarantine, which has been in effect since November 1928, was issued for the purpose of preventing the spread of the Woodgate rust, a disease which attacks Scotch and other hard pines. No spread of the disease, outside the present regulated area comprising the counties of Clinton, Essex, Franklin, Hamilton, Herkimer, Jefferson, Lewis, Madison, Oneida, and St. Lawrence, N.Y., was reported, and no violations of the quarantine were intercepted during the fiscal year.

WHITE-PINE-BLISTER-RUST QUARANTINE ENFORCEMENT

A revision of the quarantine regulations on account of the white-pine blister rust (*Cronartium ribicola* Fischer) effective January 1, 1933, greatly extended the area into which protected white pines might be shipped from the infected States. Prior to 1928, it was necessary to rely largely on embargoes prohibiting the shipment of blister-rust host plants from generally infected areas to other sections of the country. For several years since that time, the protection of five-leaved pine nursery stock by eliminating currant and gooseberry plants (*Ribes*) in the vicinity has been tried out in a limited way. Under the new revision, the general principle of growing five-leaved pine for interstate movement under such protected conditions has been extended and the shipment of such protected pine to noninfected States has been authorized.

This change was based (1) on increasing evidence of the effectiveness and practicability of *Ribes* eradication for the protection of nursery stock, and (2) on the discovery that the natural spread of the disease had carried it from 16 Northern States where it had been known for some time to 5 additional adjoining States.

The newly infected States which it was necessary to add in this revision of the regulations are Iowa, Maryland, Ohio, Virginia, and West Virginia. In each of the States named blister rust was found at only a few points, and the infections were light. The District of Columbia is also classed as infected because of its location between Maryland and Virginia, although the blister rust has not yet appeared within the District limits. The rust was discovered in most cases only on wild currant or gooseberry plants or on European black currants in gardens, having reached the new localities apparently by wind spread from infected pines in adjoining States.

The new regulations greatly extend the market for white pines and other five-leaved pines grown under protected conditions, by authorizing their movement under permit throughout the United States or into such States as may be specified in the permit.

For all or parts of the shipping season of 1932-33, permits were in effect covering 10 nurseries in the infected States, and 2 additional seed beds were covered by tentative permits, the environs being subject to reinspection before the pines would be old enough to ship. At the close of the fiscal year inspections of the premises and environs of 38 nurseries were under way to determine whether they were entitled to permits for the coming fall and spring. The premises of many applicants have been found not to comply with the requirements in full, and it has not been possible to issue permits to the owners of the nurseries involved.

The revision also simplified the interstate shipment of currant and gooseberry plants from the infected States. Hereafter, such plants will not be required to be disinfected in lime-sulphur, unless shipped with active buds.

During the year 107 shipments of five-leaved pines or *Ribes* were intercepted as moving in violation of the blister-rust quarantine regulations.

TRANSIT INSPECTION

Transit inspection consists of checking shipments of plants moving by mail, express, and freight, to determine whether they have met the safeguards required under domestic plant quarantines.

Such quarantines can prevent the transportation of serious pests into new localities only if infested products are prevented from being shipped from the quarantined districts to outside points. Such infestations may be carried to new areas by those ignorant of, or indifferent to, the required safeguards. The transit inspectors work in important post offices and at express and freight transfer points through which quarantined products move, and, on discovering uncertified shipments which may carry infestation, return them to the sender.

This work is particularly necessary when new areas or new products are brought under quarantine. In such cases, interested shippers cannot all be reached or their indifference overcome, until a check is made on the movement of the plants or other products concerned. The Department has found that when such checking is not carried out a considerable proportion of plant shipments are sent without having been inspected or having complied with the safeguards needed to prevent the spread of infestation. With transit inspection in operation, however, the number of quarantine violations is reduced to 1 or 2 shipments in every thousand, and these are intercepted and turned back. For example, western Pennsylvania was brought within the area regulated under the Japanese-beetle quarantine in the fall of 1932, but checking on common-carrier shipments was not started until May 20, 1933. Thirty-four shipments moving in violation of the Federal and State quarantines on account of this pest were intercepted during the first 8 days of such checking. Within the next 2 weeks thereafter shippers had so familiarized themselves with the requirements that the number of violations was reduced to less than one a day.

The return of the plants to the sender under such conditions is proving a much more desirable procedure than prosecuting the shipper. Since this project was organized several years ago, prosecutions have been instituted only in the case of apparently intentional violations or where gross carelessness was involved.

The most important change in the project during the year consisted of the establishment of transit inspection at Jacksonville, Fla., in August 1932, in cooperation with the State plant board. The number of interceptions reported immediately showed the importance of this point for the protection of the State against the introduction of the Japanese beetle and other pests, as well as for the enforcement of the narcissus-bulb quarantine.

The number of violations intercepted at the various inspection points during the fiscal year 1933 totaled 1,486, out of 873,153 shipments, 625 carloads, and 1,276 trucks checked. A synopsis of the work is given in tables 13 and 14. The information given in table 13 includes interceptions of this type made by inspectors employed on other projects working in direct cooperation with transit inspectors but does not include reports from State inspectors at points of destination, except in the case of Florida where, as stated, the work is carried on in direct cooperation with the Department. The numbers of shipments inspected and of interceptions, respectively, are lower than during the past several years, partly on account of reductions in the number of inspectors owing to reduced appropriations, and partly on account of lessened total traffic in plants resulting from the depressed economic conditions throughout the country.

TABLE 13.—Summary of shipments of nursery stock and other articles intercepted in violation of Federal plant quarantines¹ at transit inspection points, fiscal year 1933

Station	Number of shipments intercepted in violation of quarantine—																		Grand total
	No. 38		No. 43, C	No. 45		No. 48		No. 53, NC	No. 62		No. 63		No. 64		No. 67		Total		
	C	NC		C	NC	C	NC		C	NC	C	NC	C	NC	C	NC	C	NC	
Albany						1	1										1	1	2
Atlanta							2			1					4	2	4	5	9
Boston				68	96	93	84	3	4		4	7		1			169	191	360
Chattanooga															2		2		2
Chicago	1	1	1	2	11	13	32	2	10	16	35	11		1			62	74	136
Dallas															2		2		2
Jacksonville					5	15	56	2	22	10						2	37	75	112
Jersey City						7	1		1								8	1	9
Kansas City					1	3	7		8		8	3					19	11	30
Long Island City						10											10		10
Milwaukee						1											1		1
Nashville															2		2		2
New York			1	32	44	121	153	5	36	8	1	7					191	217	408
Omaha					1	2	10		2	5	6		1	2			11	18	29
Philadelphia				6	6	124	67		5	1	5	1					140	75	215
Pittsburgh				1		19	12			1	1						21	13	34
Portland		1							7	6	5	2					12	9	21
St. Louis							1				1						1	1	2
St. Paul and Minneapolis						1	4		3	1		3		2			4	10	14
Salisbury							1								3		3	1	4
Seattle		11								6		4						21	21
Shreveport, La.														1			1		1
Spokane	1	1				1	3	1	12	6	1	1					15	12	27
Sunnyside, N.Y.						1											1		1
Texarkana					1			1							1		1	2	3
Washington				1	1	7	15		5	1	1						14	17	31
Total	2	14	2	110	166	419	449	14	115	62	68	39	1	6	15	4	732	754	² 1,486

¹ Quarantine No. 38 relates to black stem rust; no. 43, to the European corn borer; no. 45, to the gypsy moth and brown-tail moth; no. 48, to the Japanese beetle; no. 53, to the satin moth; no. 62, to narcissus pests; no. 63, to the white pine blister rust; no. 64, to the Mexican fruit worm; and no. 67, to the phony peach disease. C indicates packages sent by commercial shippers; NC, shipments by those not commercially engaged in the business to which the quarantine relates.

² The total number of quarantine violations represents 1,423 shipments, of which 59 were in violation of 2 quarantines, and 2 were in violation of 3 quarantines.

TABLE 14.—*Shipments of nursery stock and other plants and plant products inspected in transit during the fiscal year 1933*

Station	Packages				Carloads of nursery stock and livestock cars	Trucks
	Parcel post	Express	Freight	Total		
Albany.....	963	333	28	1,324		
Atlanta.....	2,166	2,940	490	5,596	1	
Boston.....	23,041	38,400	80	61,521	18	
Chattanooga.....		269	69	338		
Chicago.....	117,229	23,087	1,896	142,212	111	1,276
Dallas.....	1,045	2,577	17	3,639		
Jacksonville.....	11,007	19,578	12,063	42,648	198	
Kansas City.....	35,133	9,079		44,212		
Memphis.....	794	1,642	306	2,742		
Meridian.....		107	13	120		
Milwaukee.....	74	8		82		
Nashville.....	192	406	271	869		
New York.....	116,429	21,803	1,381	139,613	61	
Omaha.....	19,871	3,929	1,935	25,735		
Philadelphia.....	150,063	62,969	1,256	214,288	198	
Pittsburgh.....	25,093	6,600	243	31,936		
Portland.....	18,292	7,132	2,364	27,788		
St. Louis.....	2,009	1,816		3,825		
St. Paul.....	28,978	6,338	8,310	43,626	23	
Salisbury and Spencer, N.C.....	125	667	516	1,308		
Seattle.....	18,512	3,704	288	22,504		
Shreveport, La.....		230	7	237		
Spokane.....	32,723	2,893	810	36,426		
Texarkana.....	364	2,972	107	3,443	1	
Washington.....	4,747	10,038	2,336	17,121	15	
Total.....	608,850	229,517	34,786	873,153	626	1,276

In addition to the figures given in table 13, the transit inspectors intercepted 141 shipments moving intrastate in violation of State quarantines relating to pests covered by Federal quarantines and enforced by the States concerned in cooperation with this Bureau.

FOREIGN PLANT QUARANTINES

The 22 foreign plant quarantines and regulatory orders of the Department prohibiting or restricting the entry of various plants and plant products into the United States are enforced through the Division of Foreign Plant Quarantines by inspectors and collaborators stationed at the more important ports of entry and foreign-mail distributing points, and working in close cooperation with employees of other Government departments. Detailed information on these quarantines and orders is available in other publications and is therefore omitted.

In succeeding sections explanations of enforcement activities in connection with these quarantines and orders are given in more detail and are accompanied by tables presenting in condensed form records which indicate the scope of the work or which summarize its results.

RECORDS OF IMPORTS OF RESTRICTED PLANTS AND PLANT PRODUCTS

Under the various foreign quarantines certain plants and plant products are restricted as to entry, are subject to inspection and, if necessary, disinfection, for the purpose of excluding plant diseases and insect pests. Among such restricted plants and plant products are nursery stock, plants, bulbs, and seeds; fruits and vegetables; grains from certain countries; cotton, cotton waste, cotton wrappings (bagging), and cottonseed products; also cottonseed, seed cotton, and cottonseed hulls from the Imperial Valley, Lower California, Mexico. A record of the importation of the products inspected by inspectors of the Bureau and, if necessary, treated under their supervision, is given.

IMPORTATIONS OF NURSERY STOCK, PLANTS, BULBS, AND SEEDS

The importations recorded in tables 15 to 18, inclusive, are entered under regulation 3 of Quarantine No. 37, under permits that are valid until revoked and that do not limit the quantity that may be imported. The restrictions under this regulation are intended merely to afford opportunity to inspect and, if necessary, to safeguard the products as they are entered. Table 15 records the number of importations of fruit and nut cuttings and scions and rose stocks inspected and, if necessary, safeguarded, during the fiscal year 1933. This table also shows the total number of such importations similarly handled during the fiscal year 1932. A record of certain bulbs entered under permit subject to inspection and treatment is furnished in table 16. Table 17 records the number of various kinds of bulbs entered under permit for each of the past 8 years. Table 18 shows the number of pounds of tree seeds imported under permit for the fiscal year 1933 and the countries of origin of such seeds.

In addition to the foregoing there were imported from Canada under regulation 15, Quarantine No. 37, 119,990 bulbs, plants, trees, and cuttings, as compared with 190,408 during the fiscal year 1932. To authorize the importation of this material 696 permits were issued during the fiscal year 1933, as compared with 605 issued during the fiscal year 1932.

The record of entry under special permits issued under the provisions of regulation 14 of Quarantine No. 37 for the purpose of keeping the country supplied with new, improved, or unavailable varieties and necessary propagating stock and for experimental, educational, or scientific purposes is given in table 19.

TABLE 15.—*Importation of fruit and nut cuttings and scions, and of rose stocks under regulation 3, Quarantine No. 37, from countries indicated, fiscal year 1933*

[Figures indicate number of plants]

Kind of stocks, cuttings, and scions	Aus- tria	Can- ada	Czecho- slo- vakia	Eng- land	France	Ger- many	Greece	Hun- gary	Italy	Lith- uania	Nether- lands	Poland	Ru- mania	Scot- land	Total	
															1933	1932
Cuttings and scions:																
Apple.....		287	15	96						108		16			522	305
Apricot.....																12
Avocado.....																66
Cherry.....	24					16									40	120
Fig.....									561						561	119
Grape.....			2		50		15	35	2, 250		12		4, 266		6, 630	1, 288
Medlar.....																1
Nut.....																122
Peach.....	23														23	
Pear.....	26		15												41	48
Pineapple.....																700
Plum.....	21			80		11			23						135	46
Prune.....																19
Rose stocks.....				474, 900	205, 000	15, 000			7		5, 733, 475			25, 000	6, 453, 382	9, 522, 296
Total.....	94	287	32	475, 076	205, 050	15, 027	15	35	2, 841	108	5, 733, 487	16	4, 266	25, 000	6, 461, 334	9, 525, 142

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TABLE 16.—Importation of bulbs under regulation 3, Quarantine No. 37, from countries indicated, fiscal year 1933

[Figures indicate number of bulbs]

Bulbs	Australia	Bermuda	Canada	China	Czechoslovakia	England	France	Germany	India	Ireland	Italy	Japan	Manchuria	Netherlands	New Zealand	Palestine	Philippine Islands	Scotland	Switzerland	Union of South Africa	Total
Chionodoxa.....						100				24				416, 123							416, 247
Convallaria.....					60	24		9, 525, 205						667, 145							10, 192, 434
Crocus.....						670		10		256				7, 001, 876		5		16			7, 002, 833
Eranthis.....						24								144, 995							145, 019
Fritillaria.....						100						10		128, 519							128, 629
Galanthus.....						5, 300	73, 400			23				566, 493							645, 216
Hyacinth.....	7	500				149	301, 543							16, 370, 604							16, 672, 803
Ixia.....							12							114, 771	15					12	114, 810
Lily.....	6	¹ 418, 989	133			1, 531	638, 506	30	844	10	56	² 13, 815, 629	100	320, 260			12	12			15, 196, 118
Muscari.....														934, 073							934, 073
Narcissus ³				14, 820																	14, 820
Scilla.....						1, 084	1							1, 252, 987		7		100	2		1, 254, 181
Tulip.....			181	150		694	86, 475	215				2, 002		92, 665, 321				224			92, 755, 262
Total.....	13	419, 489	314	14, 970	60	9, 676	1, 099, 937	9, 525, 460	844	313	56	13, 817, 641	100	120, 583, 167	15	12	12	352	2	12	145, 472, 445

¹ Includes 12 lily bulbs imported into Puerto Rico from Bermuda.² Includes 1,885 lily bulbs imported into Hawaii from Japan.³ The order of the Acting Secretary of Agriculture of Oct. 31, 1928, authorizes the importation of the Chinese sacred lily (*Narcissus tazetta* var. *orientalis*) into Hawaii for local use and distribution under permit and subject to inspection, under the provisions of regulation 3 of Quarantine No. 37.

TABLE 17.—Summary of bulb importations under regulation 3, Quarantine No. 37, for fiscal years 1926-33

[Figures indicate number of bulbs]

Bulbs	1926	1927	1928	1929	1930	1931	1932	1933
Chionodoxa.....	839, 637	466, 872	439, 075	487, 228	476, 422	548, 465	518, 835	416, 247
Convallaria.....	20, 543, 785	20, 558, 460	24, 738, 880	23, 087, 167	23, 661, 236	17, 273, 064	16, 015, 817	10, 192, 434
Crocus.....	10, 898, 968	9, 969, 070	8, 775, 467	9, 886, 546	8, 075, 439	9, 033, 346	8, 801, 592	7, 002, 833
Eranthis.....	214, 173	144, 150	135, 842	143, 592	188, 611	186, 516	186, 630	145, 019
Fritillaria.....	209, 543	125, 688	111, 778	115, 658	122, 699	166, 174	137, 052	128, 629
Galanthus.....	1, 128, 335	844, 544	662, 989	718, 130	751, 523	918, 613	800, 922	645, 216
Hyacinth.....	23, 682, 560	23, 711, 178	22, 127, 888	21, 450, 547	20, 255, 057	21, 759, 225	19, 360, 849	16, 672, 803
Ixia.....	545, 278	529, 404	704, 644	827, 154	461, 252	368, 982	326, 790	114, 810
Lily.....	16, 031, 090	16, 228, 762	19, 917, 477	21, 453, 024	20, 737, 428	19, 561, 911	17, 370, 254	¹ 15, 196, 118
Muscari.....	1, 404, 573	993, 339	1, 150, 220	1, 639, 982	1, 473, 455	1, 523, 243	1, 361, 018	934, 073
Narcissus.....	142, 384, 199	⁽²⁾	⁽²⁾	⁽²⁾	⁽²⁾	⁽²⁾	17, 880	¹ 14, 820
Scilla.....	2, 012, 750	1, 553, 313	1, 341, 685	1, 436, 988	1, 544, 889	1, 699, 123	1, 618, 579	1, 254, 181
Tulip.....	106, 849, 572	129, 681, 036	161, 940, 818	191, 959, 162	163, 604, 912	153, 868, 063	125, 381, 713	92, 755, 262
Unclassified.....		11, 112						
Total.....	326, 744, 463	204, 816, 928	242, 046, 763	273, 205, 178	241, 352, 923	226, 906, 725	191, 897, 981	145, 472, 445

¹ This table includes 1,885 lily bulbs and 14,820 *Narcissus tazetta* imported into Hawaii and 12 lily bulbs imported into Puerto Rico in the fiscal year 1933.² Imported under regulation 14, Quarantine No. 37, since Jan. 1, 1926.

TABLE 18.—Importation of tree seeds under regulation 3, Quarantine No. 37, from countries indicated, fiscal year 1933

[Figures indicate number of pounds]

Country of origin	Apple	Apricot	Banana	Cherry	Elm	Nut and palm	Orna-mental and tree	Peach	Pear	Persim-mon	Plum	Quince	Rose	Miscel-laneous	Total
Australia.....						11, 886	27	1						6	11, 920
Argentina.....														2	2
Austria.....	565			1		5	15, 201		7				2		15, 781
Azores.....							5								5
Belgian Congo.....						2									2
Brazil.....						102	1								103
British Guiana.....						5									5
Canada.....							5, 737								5, 737
Canal Zone.....						1	2							1	4
Ceylon.....							6							1	7
China.....					258	143	21							6	428
Costa Rica.....							1								1

TABLE 18.—*Importation of tree seeds under regulation 3, Quarantine No. 37, from countries indicated, fiscal year 1933—Continued*

Country of origin	Apple	Apricot	Banana	Cherry	Elm	Nut and palm	Orna- mental and tree	Peach	Pear	Persim- mon	Plum	Quince	Rose	Miscel- laneous	Total
Cuba						5	4							2	11
Czechoslovakia							308								308
Denmark							50								50
England							9								9
France	3,481	5	1	1,911		38	393		126			25			5,980
Germany	11			9		3	3,316		3		2		47		3,391
Gold Coast							1								1
Greece							2								2
Guatemala						1	1				1				3
India							11								11
Italy						226	6,305			10					6,541
Jamaica						2								1	3
Japan				50	25	345	3,188		373	6			293	2	4,282
Java						1	1								2
Manchuria					116		150							1	267
Mauritius						13									13
Mexico							10							2	12
Netherlands							1								1
New Zealand							509								509
Nicaragua						5	13								18
Palestine							4								4
Panama														1	1
Peru							1								1
Philippine Islands						1	2							2	5
Poland							13								13
Salvador														4	4
Scotland							146								146
Sierra Leone							11								11
Straits Settlements						5									5
Sudan							2								2
Tanganyika Territory														1	1
Trinidad						260	2								262
Uganda						6									6
Union of South Africa						10	9								19
Virgin Islands						1									1
Total ¹	4,057	5	1	1,971	399	13,066	35,463	1	509	16	3	25	342	32	55,890

¹ In addition to the seeds indicated, 417 small mail packages of miscellaneous seeds were imported into the continental United States from various countries; also the following were imported into Puerto Rico: 1 package of nut and palm seeds from Ceylon; 798 pounds of seeds of ornamentals and trees from Guadeloupe, Panama, St. Croix, and Venezuela; and into Hawaii the following: 2 packages and 2,556 pounds of nut and palm seeds, 32 packages and 103 pounds of seeds of ornamental and tree seeds, 3 packages of persimmon seeds, and 1 package of rose seeds from American Samoa, Argentina, Australia, Brazil, Ceylon, China, Cuba, Fiji, France, Germany, Guatemala, India, Japan, Makatea Island, Marshall Islands, Mexico, New Zealand, Philippine Islands, Straits Settlements, Sumatra, Tahiti, and the Union of South Africa.

TABLE 19.—*Special-permit importations, fiscal year 1933, with combined total for fiscal years 1920-33*

Class of plants	Fiscal year 1933				Total for fiscal years 1920-33 ¹			
	Permits issued		Importations under permits		Permits issued		Importations under permits	
	Num-ber	Quantity authorized	Num-ber	Quantity imported	Num-ber	Quantity authorized	Num-ber	Quantity imported
Dahlia.....	71	2, 156	62	1, 859	843	58, 381	724	42, 283
Gladiolus.....	109	111, 197	99	85, 812	1, 989	50, 803, 171	1, 683	28, 730, 627
Iris, bulbous.....	56	1, 137, 883	91	1, 794, 589	1, 591	53, 627, 689	1, 372	39, 193, 464
Iris, rhizomatous.....	49	1, 325	47	1, 206	1, 566	293, 662	1, 380	158, 861
Narcissus.....	70	220, 674	79	1, 076, 356	1, 401	163, 079, 733	1, 176	79, 220, 053
Orchid.....	195	15, 148	169	11, 526	2, 115	244, 445	1, 891	189, 368
Peony.....	29	1, 387	33	1, 342	1, 259	1, 399, 089	1, 043	684, 842
Rose.....	82	5, 290	82	4, 675	1, 453	270, 988	1, 295	192, 728
Fruit (trees and small fruits)....	16	955	14	696	227	20, 816	163	10, 179
Herbaceous.....	87	29, 404	159	34, 446	1, 719	4, 870, 979	1, 382	3, 045, 034
Miscellaneous bulbs, roots, etc....	128	85, 208	122	67, 643	1, 907	13, 029, 492	1, 663	6, 829, 297
Ornamental.....	344	57, 766	302	48, 144	2, 561	3, 993, 023	2, 268	2, 295, 929
Total.....	-----	1, 668, 393	-----	3, 128, 294	-----	291, 691, 468	-----	160, 592, 665

¹ Complete totals for Hawaii included for the first time. Previous reports carried Hawaiian totals for 1931 and 1932 only.

NOTE.—The disparity in the number of bulbs, plants, etc., imported, as compared with the number authorized entry, may be explained by the fact that permits for some classes of plants, particularly narcissus and bulbous iris, are usually issued during 1 fiscal year and the importations made during the following fiscal year.

During the year 1,145 permits were issued authorizing the entry of 1,668,393 plants, bulbs, etc. A total of 3,128,294 plants, bulbs, etc., were imported under 1,074 permits, as compared with 3,547,552 in 1932. While it would appear that more plant material has been imported than was authorized entry, this disparity is explained in the note following table 19. Importations of narcissus were 562,830 bulbs less, and those of bulbous iris 153,089 bulbs more than in 1932. Small increases in quantities imported are recorded for dahlias, gladiolus, and ornamentals, while the total importations of rhizomatous iris, orchids, peonies, roses, fruits (trees and small fruits), herbaceous, and miscellaneous bulbs, roots, etc., were less than for these classes of plants in 1932. The greatest rate of increase in importations occurred in gladiolus, and the heaviest rate of decrease is noted in rhizomatous iris. A comparison of the records shows an increasing use of the mails for these importations. In 1933, 71 percent of the importations were authorized to come forward by mail as compared with the 60 percent so authorized in 1932. A summary of special permits issued during the entire period of the quarantine to date is given in table 20.

TABLE 20.—*Special-permit importations, yearly totals for fiscal years 1920-33*¹

Fiscal year	Permits issued		Importations under permits		Fiscal year	Permits issued		Importations under permits	
	Number	Quantity authorized	Number	Quantity imported		Number	Quantity authorized	Number	Quantity imported
1920-----	311	10,752,844	171	3,484,195	1928-----	1,638	37,955,017	1,386	24,645,001
1921-----	623	13,965,113	411	8,132,634	1929-----	1,389	16,981,012	1,377	17,972,441
1922-----	751	9,573,223	519	3,344,050	1930-----	1,343	11,219,533	1,102	2,073,116
1923-----	902	15,176,718	723	10,358,921	1931-----	1,418	8,230,924	1,300	10,121,457
1924-----	1,115	15,381,913	869	12,561,574	1932-----	1,306	6,276,579	1,195	3,547,552
1925-----	1,249	9,518,620	1,099	8,575,741	1933-----	1,145	1,668,393	1,074	3,128,294
1926-----	1,465	80,983,487	1,220	6,022,041	Total	16,135	291,691,468	13,725	160,592,665
1927-----	1,480	54,008,092	1,279	46,625,648					

¹ Complete totals for Hawaii included for the first time. Previous reports carried Hawaiian totals for 1931 and 1932 only.

NOTE.—The disparity in the number of bulbs, plants, etc., imported, as compared with the number authorized entry, may be explained by the fact that permits for some classes of plants, particularly narcissus and bulbous iris, are usually issued during one fiscal year and the importations made during the following fiscal year.

The number of varieties considered has now reached a total of 62,570 (an increase of 3,242 during the year), of which 60,214 have been approved for entry. Table 21 shows the distribution of these varieties among the various classes of plants as well as a comparison of the 1933 importations with those of 1932 for each class. The distribution of special-permit material by States is shown in table 22, which is cumulative.

TABLE 21.—*Special-permit material: Number of different varieties of plants requested and approved for the fiscal years 1920-33,¹ and comparison of importations for the fiscal years 1932 and 1933*

Class of plants	Number of varieties of plants for which permits were requested and approved, 1920-33			Number of plants, bulbs, etc., imported	
	Permits requested	Permits approved	Percentage approved	1932	1933
Dahlia-----	4,071	3,889	95.53	1,813	1,859
Gladiolus-----	2,474	2,298	92.89	76,455	85,812
Iris, bulbous-----	562	561	99.82	1,641,500	1,794,589
Iris, rhizomatous-----	3,163	2,982	94.28	13,213	1,206
Narcissus-----	2,524	2,514	99.60	1,639,186	1,076,356
Orchid-----	11,895	11,875	99.83	12,967	11,526
Peony-----	2,547	2,279	89.48	3,720	1,342
Rose-----	5,505	5,024	91.26	8,975	4,675
Fruit (trees and small fruits)-----	359	343	95.54	1,042	696
Herbaceous-----	7,924	7,727	97.51	37,165	34,446
Miscellaneous bulbs, roots, etc-----	3,680	3,639	98.89	71,597	67,643
Ornamental-----	17,866	17,083	95.62	39,919	48,144
Total-----	62,570	60,214	96.23	3,547,552	3,128,294

¹ Exclusive of varieties considered in Hawaii.

TABLE 22.—*Distribution, by States, showing number of plants, bulbs, etc., of special-permit material imported for the fiscal years 1920-33*

State or Territory	Dahlia	Gladiolus	Iris, bulb- ous	Iris, rhizom- atous	Narcissus	Orchid	Peony
Alabama.....		15, 115	30, 980		6, 000		50
Arizona.....	14	12			1, 000	14	
Arkansas.....			20, 000				
California.....	6, 722	1, 935, 515	11, 125, 123	34, 578	5, 680, 294	40, 625	4, 185
Colorado.....	66	44, 197	33, 490			2, 055	150
Connecticut.....	1, 301	16, 744	84, 822	1, 584	57, 293	1, 527	113
Delaware.....		2, 000	169, 300	22	28	1, 909	1, 018
District of Columbia.....	166	516	215	93	267	385	
Florida.....		48, 930	357, 362		6, 915, 130	2, 983	
Georgia.....	360	9, 210	330, 479	181	14, 760		
Hawaii ¹	12	298		534		10, 696	
Idaho.....		1, 248	2, 534	24			
Illinois.....	937	3, 286, 307	901, 938	15, 714	306, 410	2, 448	47, 933
Indiana.....	207	2, 390, 112	502, 765	3, 123	1, 371	360	10, 213
Iowa.....		112, 225	10, 035	10	250		24, 012
Kansas.....	99		32	2, 263	141		3, 070
Kentucky.....	408		51, 200		564	415	133
Louisiana.....	129	2, 695	32, 744		10, 363	2, 070	
Maine.....		350		43		12	262
Maryland.....	546	41, 842	844, 490	413	1, 923, 488	648	20, 833
Massachusetts.....	2, 335	3, 456, 150	542, 250	3, 523	102, 539	28, 583	6, 761
Michigan.....	4, 514	12, 384, 515	1, 188, 486	3, 919	2, 642, 333	705	87, 719
Minnesota.....	214	89, 202	345	3, 485	11, 000	822	7, 549
Mississippi.....	49	6, 500	52, 776	9	9, 260		
Missouri.....	253	3, 173	281, 211	641	1, 238	4, 706	991
Montana.....		32					
Nebraska.....	276	1, 142					14
New Hampshire.....	7	40, 065	21, 862	71	147	185	
New Jersey.....	7, 965	123, 839	1, 108, 169	11, 481	1, 254, 814	28, 451	41, 009
New Mexico.....			5, 123	6	270		
New York.....	4, 883	2, 656, 649	6, 241, 879	45, 039	15, 870, 921	36, 983	223, 095
North Carolina.....	82	775, 417	6, 195, 895	15	1, 609, 305	845	
North Dakota.....		63, 615					7
Ohio.....	2, 823	492, 382	67, 079	20, 761	1, 301	652	129, 391
Oklahoma.....		510	14, 000				
Oregon.....	1, 864	76, 157	1, 331, 936	1, 746	2, 757, 385		2, 831
Pennsylvania.....	2, 053	394, 156	462, 768	2, 997	3, 569, 418	18, 823	53, 970
Puerto Rico.....						184	
Rhode Island.....	1, 078	2, 498	258, 101	1, 599	316, 800	157	5, 209
South Carolina.....			297, 500	2	8, 890, 684		
South Dakota.....		1, 701		11			2, 443
Tennessee.....	623		194, 002	803	839, 257		232
Texas.....	1	2, 000	960, 170	50	7, 766, 143	30	
Utah.....	7	1, 131	30, 750		11, 400		
Vermont.....		27, 062	8, 010	36			2, 359
Virginia.....	313	20, 465	2, 919, 363	4	5, 611, 838	45	1, 682
Washington.....	1, 710	148, 795	2, 400, 316	3, 538	12, 767, 386	1, 036	3, 656
West Virginia.....		230	4, 000				
Wisconsin.....	266	55, 925	109, 964	543	269, 250	1, 014	3, 952
Total ¹	42, 283	28, 730, 627	39, 193, 464	158, 861	79, 220, 053	189, 368	684, 842

¹ Complete totals for Hawaii included for the first time. Previous reports carried Hawaiian totals for 1931 and 1932 only.

TABLE 22.—*Distribution, by States, showing number of plants, bulbs, etc., of special-permit material imported for the fiscal years 1920-33—Continued*

State or Territory	Rose	Fruit ¹	Herba- ceous ¹	Miscel- laneous bulbs, roots, etc. ¹	Orna- mental	Total
Alabama.....	174		115	335	1,879	54,648
Arizona.....	9		237	4	5,227	6,517
Arkansas.....	50					20,050
California.....	42,922	454	4,979	134,129	2,101,451	21,110,977
Colorado.....			100		5,887	85,945
Connecticut.....	31,608		2,572	565	157,885	356,014
Delaware.....			42	175	5,319	179,813
District of Columbia.....	320		2	803	379	3,146
Florida.....	21		221	85,855	279,026	7,689,528
Georgia.....	108	2		180	3,279	358,559
Hawaii ²		1,181	13	1,893	4,654	19,281
Idaho.....			6	193	31	4,036
Illinois.....	10,191	7	3,116	6,134	229,199	4,810,334
Indiana.....	2,780		604	7,983	30,846	2,950,364
Iowa.....		875	126	180	14,373	162,086
Kansas.....	60		50	133	574	6,422
Kentucky.....	2		92		64	52,878
Louisiana.....	190		106	773	1,615	50,685
Maine.....			172	980	1,013	2,832
Maryland.....	4,855	6	1,058	2,083	79,244	2,919,506
Massachusetts.....	3,442	24	1,573	4,609	438,239	4,590,028
Michigan.....	335		16,791	17,182	574,178	16,920,682
Minnesota.....	160			3,621	35,628	152,026
Mississippi.....	70			5	252	68,921
Missouri.....			274	167	19,803	312,457
Montana.....					100	132
Nebraska.....					351	1,783
New Hampshire.....		6	147	602	1,514	64,606
New Jersey.....	41,600	451	69,154	21,969	2,707,179	5,416,081
New Mexico.....				12		5,411
New York.....	28,294	309	52,781	302,257	3,080,160	28,543,250
North Carolina.....				20,505	764	8,602,828
North Dakota.....	1					63,623
Ohio.....	5,267	164	8,088	14,403	773,019	1,515,330
Oklahoma.....					198	14,708
Oregon.....	2,045		562	69,080	55,186	4,298,792
Pennsylvania.....	12,238		610	12,071	256,095	4,785,199
Puerto Rico.....			400		302	886
Rhode Island.....	552		173	2,239	46,491	634,897
South Carolina.....			69	33	3	9,188,291
South Dakota.....	3,213		12		896	8,276
Tennessee.....	87			637	3,462	1,039,103
Texas.....	808	36	10		76,357	8,805,605
Utah.....					4,747	48,035
Vermont.....				98	2,610	40,175
Virginia.....	16		104	4,623	45,939	8,604,392
Washington.....	790	3	1,226	33,259	162,371	15,524,086
West Virginia.....					36	4,266
Wisconsin.....	520		1,126	2,636	49,979	495,175
Total ²	192,728	3,518	166,711	752,406	11,257,804	160,592,665

¹ Prior to 1929 this material was recorded under ornamentals, etc.² Complete totals for Hawaii included for the first time. Previous reports carried Hawaiian totals for 1931 and 1932 only.

IMPORTATIONS OF COTTON, COTTON WRAPPINGS (BAGGING), COTTONSEED AND COTTONSEED PRODUCTS

Tables 23 to 26, inclusive, indicate, respectively, the importations during the fiscal year of cotton, cotton waste, cotton wrappings (bagging), cottonseed and cottonseed products which were inspected and when necessary fumigated or otherwise treated under supervision. The actual number of bales of cotton, cotton waste, and bagging is indicated, and inasmuch as bales vary in size they are referred to as running bales.

TABLE 23.—*Importation of running bales of ginned cotton, by country of growth and port of entry, fiscal year 1933*

Country	Boston	Buffalo	Calex-ico	Detroit	El Paso	New-port	New York	Niagara Falls	Philadelphia	Portland	Rouses Point	St. Albans	San Francisco	San Pedro	Seattle	Vanceboro	Total
Anglo-Egyptian Sudan	14,698						250										14,948
British West Indies	13						84										97
China	2,527						5,441						28,381	4,550	5,996		46,895
Dutch East Indies													472	313			785
Egypt	25,505						12,040										37,545
Hawaii													6				6
India	600						2,775			50			348	660	60		4,493
Japan													5				5
Mexico			4,356		212									65			4,633
Peru	455						553										1,008
United States (returned)	160	1		251		3		143	37		84	165				102	946
Total	43,958	1	4,356	251	212	3	21,143	143	37	50	84	165	29,212	5,588	6,056	102	111,361

¹ Includes 4,619 bales of linters.TABLE 24.—*Importation of running bales of cotton waste, by country of origin and port of entry, fiscal year 1933*

Country	Baltimore	Boston	Detroit	Galveston	New Orleans	New-port	New York	Niagara Falls	Philadelphia	Portland	Richford	St. Albans	San Francisco	San Pedro	Savannah	Seattle	Total
Belgium							47										47
Canada		95	69			527		40			7	686					1,424
China							100		250								350
Cuba							21										21
England	69	1,081			3				8						6		1,167
France	12	11					953										976
Germany		192		100			63		43								398
India		425					727		75				300	75			1,602
Ireland	43						183										226
Japan	50						365		490	10			805	250		670	2,640
Morocco							50										50
Netherlands							1,044										1,044
United States (returned)			62												6		68
Total	174	1,804	131	100	3	527	3,553	40	866	10	7	686	1,105	325	12	670	10,013

TABLE 25.—*Importation of running bales of bagging, by country of origin and port of entry, fiscal year 1933*

Country	Balti- more	Beau- mont	Boston	Buffalo	Charles- ton	Detroit	Fort Cov- ington	Galves- ton	Houston	Malone	New Orleans	Newport	New York
Algeria.....													65
Argentina.....													721
Australia.....													5
Belgium.....	2, 108		1, 389		31			1, 184	1, 718		787		1, 765
Canada.....			3, 881	1, 985		3, 959	5			1, 654		276	82
China.....	956												
Cuba.....	37							130	500		86		858
England.....	390	4, 960	1, 437		285			19, 692	9, 051		6, 814		846
France.....	83		945					2, 564	9, 693		625		1, 251
Germany.....		155	177		751			5, 742	2, 856		836		123
India.....								148	2, 197		1, 258		
Italy.....								379	8, 543		2, 334		106
Japan.....					200			1, 519					
Netherlands.....	443							1, 346	1, 380		3, 837		539
Portugal.....								340					
Puerto Rico.....													2, 031
Russia.....													130
Scotland.....	282							24, 473	6, 800		4, 974		1, 122
Spain.....								51	1, 520		243		467
Total.....	4, 299	5, 115	7, 829	1, 985	1, 267	3, 959	5	57, 568	44, 258	1, 654	21, 794	276	10, 111

TABLE 25.—*Importation of running bales of bagging by country of origin and port of entry, fiscal year 1933—Continued*

Country	Niagara Falls	Norfolk	Philadel- phia	Port Huron	Ranler	Rouses Point	Saint Albans	San Fran- cisco	San Pedro	Savan- nah	Seattle	Vance- boro	Total
Algeria													65
Argentina			8										729
Australia													5
Austria										402			402
Belgium		2,931								1,066			12,979
Canada	1,776		2,951	1,419	25	1,980	4,198					46	24,237
China		2,260						3,588	925	3,037			10,766
Cuba													1,611
England		8,398	3,336							3,211			58,420
France		1,925								111			17,197
Germany		4,531								1,160			16,331
India													3,603
Italy													11,362
Japan		6,054						2,219		5,984	8,464		24,440
Netherlands		3,714								602			11,861
Portugal													340
Puerto Rico		100											2,131
Russia													130
Scotland		146											37,797
Spain		1,423								81			3,785
Total	1,776	31,482	6,295	1,419	25	1,980	4,198	5,807	925	15,654	8,464	46	238,191

TABLE 26.—*Importation of cottonseed, cottonseed hulls, and cottonseed products, fiscal year 1933*

Port	Cotton-seed	Cotton-seed hulls	Cotton-seed cake	Cotton-seed meal	Cotton-seed oil
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Gallons</i>
Boston.....			4,000	36,000	
Calexico.....	¹ 14,568	¹ 5,231,449			
El Paso.....				12	1¼
Laredo.....				8	¼
Total.....	14,568	5,231,449	4,000	36,020	1½

¹ Entry of cottonseed, seed cotton, and cottonseed hulls grown in the Imperial Valley, Lower California Mexico, is allowed under permit. No seed cotton was imported this year.

In addition, the Bureau supervised the entry of 6,825 samples of cotton, cotton linters, and cotton waste imported by freight, express, and parcel post, and as passenger baggage.

IMPORTATIONS OF GRAIN AND BROOMS

Table 27 indicates importations of shelled corn inspected under the provisions of Quarantine No. 41.

TABLE 27.—*Importation (pounds) of clean shelled corn under Quarantine No. 41, by port of entry and country of growth, fiscal year 1933*

Country	Balti-more	Boston	Detroit	Douglas	El Paso	New York	Niagara Falls	Nogales
Argentina.....	747,815	55,800				3,984,962		
Canada.....			383				80	
Mexico.....				86	40			359
Union of South Africa.....						96		
United States (re-turned).....			510					
Total.....	747,815	55,800	893	86	40	3,985,058	80	359

Country	Phila-delphia	Puerto Rico (all ports)	Rio Grande City	San Francisco	Seattle	Wash-ington	Total
Argentina.....	2,774,480	150,000		19,440			7,732,497
Canada.....						1	464
Cuba.....		1,704,504					1,704,504
Dominican Republic.....		2,957,783					2,957,783
Haiti.....		9,900					9,900
Mexico.....			8			1½	494½
Union of South Africa.....					6		102
United States (returned).....							510
Total.....	2,774,480	4,822,187	8	19,440	6	2½	12,406,254½

Effective March 1, provision was made for the entry under Quarantine No. 41 of shelled corn through the mails, and of corn on the cob without permit from adjacent areas of Canada for local consumption, and under permit from certain areas in Canada and from certain other foreign countries. Since that date, 1,427 pounds of green corn on the cob were imported under inspection from Cuba and Mexico.

In addition, inspection was made under Quarantine No. 41 of 1,456 brooms made of broomcorn, and of seed other than corn, as follows: Jobs-tears, 1 gram; millet, 36,109¾ pounds; and sorghum, 1¾ pounds.

In addition, the Bureau supervised the entry under Quarantine No. 55 of 70,655 pounds of seed or paddy rice.

IMPORTATIONS OF FRUITS AND VEGETABLES

Tables 28 and 29 indicate, by countries of origin and ports of entry, respectively, the fruits and vegetables imported into the continental United States and into Hawaii and Puerto Rico during the fiscal year under permit and subject to inspection at the port of first arrival under the provisions of Quarantine No. 56, and under the regulations governing the importation of potatoes into the United States.

TABLE 28.—*Fruits and vegetables imported fiscal year 1933, by countries of origin*
[Imported under Quarantine No. 56 unless otherwise designated]

Kind	Country and quantity	Total
Apple.....pounds	England, 35; Ireland, 30; Netherlands, 150.....	215
Apricot.....do	Chile, 7,748.....	7,748
<i>Aralia cordata</i>do	Japan, 1,095.....	1,095
Arrowhead.....do	China, 162,999; Japan, 250.....	163,249
Arrowroot.....do	China, 200; Dominican Republic, 285.....	485
Artichoke (Globe).....do	Chile, 2,285.....	2,285
Asparagus.....do	Argentina, 86,388; Chile, 4,400; Mexico, 4,663.....	95,451
Avocado.....do	Cuba, 8,015,505; Mexico (seeds removed), 20,392.....	8,035,897
Balsam apple.....do	Cuba, 10,610; Mexico, 583.....	11,193
Banana.....bunches	Bermuda, 1; British Honduras, 94,082; Colombia, 2,763,882; Costa Rica, 3,719,472; Cuba, 2,673,004; Dominican Republic, 6,922; Ecuador, 27,885; Grenada, 2,107; Guatemala, 3,065,065; Haiti, 42,887; Honduras, 15,246,440; Jamaica, 2,271,074; Mexico, 5,100,906; Nicaragua, 3,289,352; Panama (including Canal Zone), 4,032,273; St. Lucia, 197; Trinidad, 763.....	42,336,312
Bean (green):		
Faba.....pounds	Mexico, 175.....	175
Lima.....do	Cuba, 4,077,393; Mexico, 107,231; Virgin Islands, 785.....	4,185,409
String.....do	Cuba, 7,655; Mexico, 2,169,871.....	2,177,526
Beet.....do	Bermuda, 100; Mexico, 207,685.....	207,785
Berry (Rubus).....do	Norway, 1,635.....	1,635
Brussels sprouts.....do	Belgium, 110; Mexico, 3.....	113
Cabbage.....do	Cuba, 39,070; Mexico, 19,210; Newfoundland, 150.....	58,430
Cacao bean pod.....do	Costa Rica, 180; Trinidad, 1,840.....	2,020
Carrot.....do	Bermuda, 100; Mexico, 327,754; Virgin Islands, 160.....	328,014
Cassava.....do	Cayman Islands, 250; China, 1,560; Cuba, 157,448; Dominican Republic, 200.....	159,458
Cauliflower.....do	Mexico, 576.....	576
Celery.....do	Bermuda, 23,800; Mexico, 47.....	23,847
Chayote.....do	Cuba, 18,761; Dominican Republic, 3,508; Mexico, 1,638.....	23,907
Cherimoya:		
Natural.....do	Chile, 180.....	180
Frozen.....do	Chile, 48.....	48
Cherry:		
Dried, sour.....do	Italy, 399,220; Yugoslavia, 837,460.....	1,236,680
Fresh.....do	Chile, 22,043.....	22,043
Cipollino.....do	Morocco, 2,559,453; Spain, 44,092.....	2,603,545
<i>Citrus medica</i>do	Albania, 2,700; Cuba, 95; Italy, 3,956; Palestine, 14,144.....	20,895
Clover top.....do	Mexico, 517.....	517
Coriander.....do	Mexico, 208.....	208
Cowpea.....do	Mexico, 12.....	12
Crosnes.....do	Belgium, 818.....	818
Cucumber.....do	Chile, 1,320; Cuba, 2,675,596; Germany, 20; Mexico, 4,204.....	2,681,140
Dasheen (includes colocasia, inhamé, malanga, taro, and yautia) (pounds)	Azores, 238,968; China, 355,624; Cuba, 241,788; Dominican Republic, 1,084,732; Japan, 168,845; Mexico, 1,827; Nicaragua, 5.....	2,091,789
Eggplant.....pounds	Cuba, 1,884,723; Mexico, 223,032; Virgin Islands, 1,070.....	2,108,825
Endive.....do	Belgium, 1,245,641.....	1,245,641
Fennel.....do	Portugal, 25.....	25
Garbanzo.....do	Mexico, 5,058.....	5,058
Garlic.....do	Argentina, 3,858; Chile, 1,619,427; China, 1,836; Italy, 759,801; Mexico, 1,496,605; Morocco, 13,513; Spain, 2,334,803.....	6,229,843
Ginger (crude).....do	China, 389,719; Cuba, 64,202; Jamaica, 16,076; Japan, 3,700; Mexico, 2; Nicaragua, 10.....	473,709
Grape:		
Fresh (not hothouse) (pounds)	Argentina, 7,578,154; Chile, 1,669,339; Mexico, 562.....	8,648,055
Frozen.....pounds	Italy, 928.....	928
Hothouse.....do	Belgium, 144,980.....	144,980
Processed.....do	Italy, 35,200.....	35,200
Grapefruit.....do	Cuba, 7,879,182; Haiti, 160.....	7,879,342
Horseradish.....do	Germany, 114,769; Sweden, 28,331.....	143,100
Husk tomato.....do	Mexico, 6,870.....	6,870
Japanese horseradish.....do	Japan, 588.....	588
Kale.....do	Bermuda, 206,605; Mexico, 4.....	206,609
Kohlrabi.....do	Mexico, 61.....	61
Kudzu.....do	China, 69,083; Cuba, 354.....	69,437
Leek.....do	Mexico, 8.....	8
Lemon.....do	Azores, 5; Chile, 24,216; Cuba, 649; Dominica, 160; Dominican Republic, 376; Italy, 10,500,286; Mexico, 76; Palestine, 3,877; Portugal, 4,752.....	10,534,397
Lettuce.....do	Mexico, 29,512.....	29,512

TABLE 28.—*Fruits and vegetables imported fiscal year 1933, by countries of origin—*
Continued

Kind	Country and quantity	Total
Lily bulb (edible)---pounds---	China, 35,995; Japan, 315-----	36, 310
Lime (sour)-----do-----	Antigua, 3,400; Chile, 1,069; Costa Rica, 291; Cuba, 13,910; Dominica, 910,469; Dominican Republic, 4,566; Grenada, 9,235; Haiti, 679; Honduras, 8,228; Jamaica, 708,798; Mexico, 2,933,313; Montserrat, 45,050; Nicaragua, 1,890; St. Lucia, 444,340; St. Vincent, 2,700; Trinidad, 128,223; Virgin Islands, 5,470.	5, 221, 631
Mango (seeds removed, frozen) (pounds).	Philippine Islands, 365-----	365
Mangosteen-----do-----	Honduras, 25-----	25
Melon-----do-----	Argentina, 83,358; Chile, 5,514,896; France, 25; Mexico, 1,767,684; Portugal, 10,420; Spain, 800,064.	8, 176, 447
Mint-----do-----	Mexico, 88-----	88
Mushroom-----do-----	Japan, 1,190-----	1, 190
Mustard-----do-----	Cuba, 9,732; Mexico, 66,332-----	76, 064
Nectarine-----do-----	Belgium, 23; Chile, 315,517-----	315, 540
Nuts:		
Acorn-----do-----	Greece, 900,000; Turkey, 17,904,359-----	18, 804, 359
Chestnut-----do-----	China, 24,100; Italy, 12,124,868; Japan, 530,387; Portugal, 1,230,791; Spain, 1,638,688.	15, 548, 834
Okra-----do-----	Cuba, 1,420,362; Mexico, 789-----	1, 421, 151
Onion-----do-----	Australia, 55,608; Bermuda, 780; Canary Islands, 41; Chile, 343,680; China, 1,270; Dominican Republic, 552; Egypt, 542,150; England, 17,920; Italy, 2,205,046; Mexico, 67,158; Netherlands, 17,920; Spain, 725,015; Virgin Islands, 8,750.	3, 985, 890
Orange:		
Under Quarantine No. 56 (pounds).	Cuba, 63,030-----	63, 030
Mandarin (Quarantine No. 28) (pounds).	Japan, 1,528,371-----	1, 528, 371
Parsley-----pounds---	Mexico, 17,918-----	17, 918
Parsnip-----do-----	Mexico, 2-----	2
Pea-----do-----	Cuba, 3,339; Mexico, 9,566,831-----	9, 570, 170
Peach-----do-----	Belgium, 123; Chile, 73,458-----	73, 581
Pear-----do-----	Chile, 589-----	589
Pepper-----do-----	Cuba, 177,223; Mexico, 1,657,174; Virgin Islands, 4,917-----	1, 839, 314
Pigeon pea-----do-----	Cuba, 762; Dominican Republic, 263-----	1, 025
Pigweed-----do-----	Mexico, 881-----	881
Pineapple-----crates---	Azores, 33; Cuba, 748,008; Ecuador, 44; Haiti, 26; Honduras, 44; Mexico, 27,599; Philippine Islands, 3,954.	779, 708
Plantain-----pounds---	British Honduras, 43,120; Cuba, 5,034,797; Dominican Repub- lic, 9,089,248; Haiti, 8,091; Honduras, 806,726; Nicaragua, 3,180; Panama (including Canal Zone), 229,457; St. Lucia, 700.	15, 215, 319
Plum-----do-----	Chile, 164,866-----	164, 866
Potato:		
Under Quarantine No. 56 (pounds).	Bermuda, 1,826,527-----	1, 826, 527
Under potato regulations (order of Dec. 22, 1913) (pounds).	Canary Islands, 59,564; Cuba, 2,199,826; Mexico, 52,100; Spain, 259,957.	2, 571, 447
Pricklypear-----pounds---	Mexico, 2,182-----	2, 182
Pumpkin-----do-----	Cuba, 142,390; Dominican Republic, 39,613; Jamaica, 350; Mexico, 8,658.	191, 011
Purslane-----do-----	Mexico, 1,246-----	1, 246
Radish-----do-----	Mexico, 73,327-----	73, 327
St. Johns bread-----do-----	Cyprus, 400,000; Greece, 132,161; Italy, 236,659; Portugal, 680; Sicily, 44,600.	814, 100
Salsify-----do-----	Mexico, 1,166-----	1, 166
Spinach-----do-----	Cuba, 88; Mexico, 48,667-----	48, 755
Squash-----do-----	Cuba, 21,056; Mexico, 157,497-----	178, 553
Strawberry:		
Natural-----do-----	Mexico, 20-----	20
Frozen-----do-----	Chile, 34-----	34
Sweetpotato-----do-----	China, 9,600; Virgin Islands, 54-----	9, 654
Swiss chard-----do-----	Mexico, 2,902-----	2, 902
Tamarind bean pod-----do-----	Antigua, 55,372; Cuba, 2,050; India, 3,008; Mexico, 317; St. Lucia, 8,400.	69, 147
Tangerine-----do-----	Cuba, 125-----	125
Tomato-----do-----	Bahamas, 256,879; Canary Islands, 4,746; Chile, 96; Cuba, 23,093,488; Dominica, 294; Mexico, 34,079,525; Montserrat, 3,120; Virgin Islands, 278,235.	57, 716, 383
Turnip-----do-----	Cuba, 336; Mexico, 214,515; Newfoundland, 150-----	215, 001
Vaccinium (cranberry, etc.):		
Natural-----pounds---	Estonia, 3,960; Finland, 1,200; Newfoundland, 249,057-----	254, 217
Frozen-----do-----	Newfoundland, 1,516,560-----	1, 516, 560
Water caltrop-----do-----	China, 13,985-----	13, 985
Waterchestnut-----do-----	China, 1 591 910-----	1, 591, 910
Watercress-----do-----	Mexico, 5,238-----	5, 238
Waterlily root-----do-----	China, 22,561; Cuba, 61,783-----	84, 344
Watermelon-----do-----	Cuba, 230,485; Mexico, 1,111,816-----	1, 342, 301
Yam-----do-----	China, 26,285; Japan, 16,260-----	42, 545
Yam bean root-----do-----	China, 20,510; Mexico, 969-----	21, 479

TABLE 29.—*Fruits and vegetables imported fiscal year 1933, by ports of entry*

[Imported under Quarantine No. 56 unless otherwise designated]

Kind	Port and quantity	Total
Apple.....pounds	Boston, 35; New York, 180.....	215
Apricot.....do	New York, 7,748.....	7,748
<i>Aralia cordata</i>do	Hawaii (all ports), 1,095.....	1,095
Arrowhead.....do	Boston, 8,100; Buffalo, 17,100; Cleveland, 492; Detroit, 500; Hawaii (all ports), 31,287; Los Angeles, 300; New York, 21,600; Niagara Falls, 2,900; San Francisco, 75,900; Seattle, 5,070.....	163,249
Arrowroot.....do	New York, 285; Niagara Falls, 200.....	485
Artichoke (globe).....do	New York, 2,285.....	2,285
Asparagus.....do	Callexico, 4; El Paso, 2; Naco, 5; New York, 90,788; San Ysidro, 4,652.....	95,451
Avocado.....do	Boston, 480; Brownsville (seeds removed), 3,367; Douglas (seeds removed), 333; Eagle Pass (seeds removed), 3,272; El Paso (seeds removed), 5,667; Hidalgo (seeds removed), 1,876; Key West, 699,287; Laredo (seeds removed), 3,824; Miami, 103,245; Naco (seeds removed), 17; New Orleans, 1,999,294; New York, 2,532,469; Nogales (seeds removed), 1,963; Philadelphia, 468; Rio Grande City (seeds removed), 36; Roma (seeds removed), 37; Tampa, 2,680,262.....	8,035,897
Balsam apple.....do	Callexico, 583; New York, 10,610.....	11,193
Banana.....bunches	Baltimore, 2,182,267; Boston, 4,050,280; Brownsville, 72,751; Callexico, 1; Charleston, 804,733; Detroit, 1,375; Eagle Pass, 5,999; Eastport, 4; El Paso, 62,756; Galveston, 2,199,536; Hidalgo, 820; Key West, 1,113; Laredo, 224,388; Los Angeles, 1,163,352; Miami, 185,162; Mobile, 2,276,084; New Orleans, 10,856,307; New York, 12,182,356; Nogales, 388; Norfolk, 262,290; Philadelphia, 3,978,544; Puerto Rico (all ports), 6,855; Rouses Point, 25; San Francisco, 1,370,756; San Ysidro, 3; Sault Ste. Marie, 2,680; Savannah, 13,681; Seattle, 16,603; Tampa, 410,696; Trout River, 14; Wilmington, 4,493.....	42,336,312
Bean (green):		
Faba.....pounds	Callexico, 8; Nogales, 167.....	175
Lima.....do	Laredo, 32,290; New York, 4,077,633; Nogales, 74,941; Puerto Rico (all ports), 545.....	4,185,409
String.....do	Brownsville, 83,028; Callexico, 838; Douglas, 1,342; Eagle Pass, 2,071; El Paso, 66,334; Laredo, 833,564; Naco, 662; New York, 7,655; Nogales, 1,119,859; Roma, 15; San Ysidro, 62,158.....	2,177,526
Beet.....do	Callexico, 843; Douglas, 4,223; Eagle Pass, 278; El Paso, 192,985; Naco, 180; New York, 100; Nogales, 9,176.....	207,785
Berry (<i>Rubus</i>).....do	New York, 1,635.....	1,635
Brussels sprouts.....do	Callexico, 3; New York, 110.....	113
Cabbage.....do	Boston, 150; Callexico, 948; Douglas, 2,845; Eagle Pass, 123; El Paso, 324; Naco, 563; New Orleans, 225; New York, 38,845; Nogales, 14,407.....	58,430
Cacao bean pod.....do	New York, 2,020.....	2,020
Carrot.....do	Callexico, 1,439; Douglas, 2,871; Eagle Pass, 251; El Paso, 303,625; Naco, 289; New York, 170; Nogales, 19,279; Puerto Rico (all ports), 90.....	328,014
Cassava.....do	Key West, 7,749; New York, 131,529; Philadelphia, 200; Seattle, 1,460; Tampa, 18,520.....	159,458
Cauliflower.....do	Callexico, 5; El Paso, 9; Naco, 6; Nogales, 556.....	576
Celery.....do	New York, 23,800; Nogales, 47.....	23,847
Chayote.....do	Callexico, 1; El Paso, 538; Key West, 470; Laredo, 1,070; New Orleans, 4,815; New York, 16,984; Nogales, 29.....	23,907
Cherimoya:		
Natural.....do	New York, 180.....	180
Frozen.....do	New York, 48.....	48
Cherry:		
Dried, sour.....do	New York, 1,107,852; Philadelphia, 128,828.....	1,236,680
Fresh.....do	New York, 22,043.....	22,043
Cipollino.....do	Boston, 44,092; New York, 2,515,416; Philadelphia, 44,037.....	2,603,545
<i>Citrus medica</i>do	Detroit, 195; El Paso, 5; New York, 20,695.....	20,895
Clover top.....do	Douglas, 517.....	517
Coriander.....do	Callexico, 208.....	208
Cowpea.....do	Callexico, 12.....	12
Crosnes.....do	New York, 818.....	818
Cucumber.....do	Baltimore, 20; Callexico, 374; El Paso, 287; Key West, 2,360; Laredo, 1,421; Miami, 9,646; Naco, 206; New Orleans, 99,831; New York, 2,565,079; Nogales, 1,916.....	2,681,140
Dasheen (includes colocasia, inhame, malanga, taro, and yautia) (pounds).	Boston, 6,675; Buffalo, 5,700; Callexico, 1,827; Cleveland, 705; Detroit, 1,000; Hawaii (all ports), 325; Key West, 8,966; Los Angeles, 23,300; Miami, 415; New York, 996,664; Niagara Falls, 13,840; Providence, 156,190; Puerto Rico (all ports), 414,066; San Francisco, 330,946; Seattle, 115,618; Tampa, 15,552.....	2,091,789
Eggplant.....pounds	Boston, 36; Callexico, 142; El Paso, 8,354; Laredo, 3,843; New Orleans, 55,341; New York, 1,830,416; Nogales, 210,693.....	2,108,825
Endive.....do	Los Angeles, 1,989; New York, 1,241,144; San Francisco, 1,708; Seattle, 800.....	1,245,641

TABLE 29.—*Fruits and vegetables imported fiscal year 1933, by ports of entry—Con.*

Kind	Port and quantity	Total
Fennel.....pounds..	New York, 25.....	25
Garbanzo.....do.....	Brownsville, 5,058.....	5,058
Garlic.....do.....	Boston, 188,086; Brownsville, 1,225; Calexico, 176,636; Douglas, 2,998; Eagle Pass, 12,904; El Paso, 30,390; Hawaii (all ports), 1,836; Laredo, 872,294; Los Angeles, 4,200; Mobile, 5,500; Naco, 444; New Orleans, 152,108; New York, 1,939,082; Nogales, 3,873; Puerto Rico (all ports), 2,822,637; San Francisco, 2,635; San Ysidro, 12,995.	6,229,843
Ginger (crude).....do.....	Boston, 11,170; Buffalo, 11,600; Calexico, 2; Chicago, 500; Detroit, 1,200; Hawaii (all ports), 2,000; Los Angeles, 9,500; New York, 148,294; Niagara Falls, 13,164; Portland, 400; San Francisco, 257,345; Seattle, 18,534.	473,709
Grape:		
Fresh (not hothouse) pounds.	Calexico, 71; Eagle Pass, 265; El Paso, 105; Laredo, 120; New York, 8,647,493; Nogales, 1.	8,648,055
Frozen.....pounds..	New York, 928.....	928
Hothouse.....do.....	New York, 144,955; San Francisco, 25.....	144,980
Processed.....do.....	New York, 35,200.....	35,200
Grapefruit.....do.....	Key West, 1,707,008; New Orleans, 1,827,540; New York, 4,344,654; Tampa, 140.	7,879,342
Horseradish.....do.....	New York, 143,100.....	143,100
Husk tomato.....do.....	Brownsville, 120; Calexico, 2; El Paso, 6,748.....	6,870
Japanese horseradish.....do.....	Hawaii (all ports), 588.....	588
Kale.....do.....	Calexico, 4; New York, 206,605.....	206,609
Kohlrabi.....do.....	Calexico, 36; El Paso, 25.....	61
Kudzu.....do.....	Boston, 2,900; Buffalo, 2,900; Chicago, 200; Detroit, 400; Los Angeles, 600; New York, 12,852; Niagara Falls, 4,500; San Francisco, 43,549; Seattle, 1,536.	69,437
Leek.....do.....	Calexico, 8.....	8
Lemon.....do.....	Boston, 75,503; Brownsville, 76; Buffalo, 22,357; Detroit, 198; New Orleans, 1,047,293; New York, 9,328,942; Pensacola, 59,680; Providence, 8; Puerto Rico (all ports), 140; Trout River, 200.	10,534,397
Lettuce.....do.....	Brownsville, 84; Calexico, 557; Douglas, 2,171; Eagle Pass, 777; El Paso, 62; Naco, 718; Nogales, 25,143.	29,512
Lily bulb (edible).....do.....	Boston, 3,470; Buffalo, 2,518; Detroit, 600; Hawaii (all ports), 1,955; Los Angeles, 300; New York, 6,884; Niagara Falls, 3,600; Portland, 10; San Francisco, 15,093; Seattle, 1,880.	36,310
Lime (sour).....do.....	Boston, 17,185; Brownsville, 34,603; Eagle Pass, 253,737; El Paso, 77,176; Key West, 1; Laredo, 2,285,570; Los Angeles, 213,782; Miami, 2,719; Mobile, 34,421; New Orleans, 58,778; New York, 2,173,008; Nogales, 43,926; Norfolk, 13,009; Philadelphia, 5,640; Puerto Rico (all ports), 360; San Francisco, 5,664; San Ysidro, 482; Seattle, 900; Tacoma, 670.	5,221,631
Mango (seeds removed, frozen) (pounds).	New York, 91; Portland, 100; San Francisco, 174.....	365
Mangosteen.....pounds..	Boston, 25.....	25
Melon.....do.....	Baltimore, 25; Boston, 6,650; Brownsville, 834; Calexico, 446,503; El Paso, 19,027; Hidalgo, 3,575; Laredo, 1,272,259; Mercedes, 557; Naco, 35; New York, 6,402,088; Nogales, 24,894.	8,176,447
Mint.....do.....	Calexico, 2; Douglas, 5; El Paso, 80; Nogales, 1.....	88
Mushroom.....do.....	Hawaii (all ports), 1,190.....	1,190
Mustard.....do.....	Calexico, 26,589; Douglas, 1,632; El Paso, 29,576; New York, 9,732; Nogales, 8,535.	76,064
Nectarine.....do.....	New York, 315,540.....	315,540
Nuts:		
Acorn.....do.....	New York, 18,676,492; Philadelphia, 127,867.....	18,804,359
Chestnut.....do.....	Hawaii (all ports), 191,470; Los Angeles, 165,580; New York, 15,002,787; San Francisco, 157,397; Seattle, 31,600.	15,548,834
Okra.....do.....	Brownsville, ¹ 160; Calexico, 20; El Paso, 528; Key West, 17,442; New Orleans, 596,425; New York, 546,039; Nogales, 81; Tampa, 260,456.	1,421,151
Onion.....do.....	Boston, 1,011,545; Brownsville, 278; Calexico, 5,456; Douglas, 8,022; Eagle Pass, 2,363; El Paso, 22,284; Naco, 2,344; New York, 2,849,757; Nogales, 26,411; Puerto Rico (all ports), 552; San Francisco, 39,378; Seattle, 17,500.	3,985,890
Orange:		
Under Quarantine No. 56 (pounds).	Miami, 42; New Orleans, 50,509; New York, 12,479.....	63,030
Mandarin (Quarantine No. 28) (pounds).	Seattle, 1,528,371.....	1,528,371
Parsley.....pounds..	Calexico, 82; Douglas, 70; El Paso, 17,108; Naco, 7; Nogales, 651.	17,918
Parsnip.....do.....	Calexico, 2.....	2
Pea.....do.....	Calexico, 248; Douglas, 641; Eagle Pass, 39; El Paso, 110; Laredo, 2,255; Naco, 5; New York, 3,339; Nogales, 9,399,412; San Ysidro, 164,121.	9,570,170
Peach.....do.....	New York, 73,581.....	73,581
Pear.....do.....	New York, 589.....	589

¹ Okra was admitted from Tamaulipas, Mexico, through the port of Brownsville under special conditions.

TABLE 29.—*Fruits and vegetables imported fiscal year 1933, by ports of entry—Con.*

Kind	Port and quantity	Total
Pepper.....pounds..	Boston, 252; Brownsville, 3,982; Calexico, 1,627; Del Rio, 6,982; Douglas, 7,851; Eagle Pass, 61,314; El Paso, 225,519; Hidalgo, 3,610; Laredo, 115,726; Naco, 1,207; New Orleans, 11,835; New York, 169,918; Nogales, 1,224,593; Puerto Rico (all ports), 135; San Ysidro, 4,653; Ysleta, 110.	1, 839, 314
Pigeon pea.....do.....	New York, 1,025.....	1, 025
Pigweed.....do.....	Douglas, 635; Naco, 125; Nogales, 121.....	881
Pineapple.....crates..	Brownsville, 1,941; Douglas, 2; Eagle Pass, 1; El Paso, 4,196; Key West, 338,095; Laredo, 20,917; Miami, 2,273; New Orleans, 89,745; New York, 305,502; Nogales, 41; Portland, 3,049; Providence, 28; San Francisco, 944; Seattle, 5; Tampa, 12,969.	779, 708
Plantain.....pounds..	Boston, 14,250; Key West, 402,830; Miami, 129,486; Mobile, 1,340; New Orleans, 410,757; New York, 4,157,716; Norfolk, 27,192; Philadelphia, 119,570; Puerto Rico (all ports), 9,093,580; Tampa, 858,598.	15, 215, 319
Plum.....do.....	New York, 164,866.....	164, 866
Potato:		
Under Quarantine No. 56 (pounds).	New York, 1,826,527.....	1, 826, 527
Under potato regulations (order of Dec. 22, 1913) (pounds).	Douglas, 24,895; Key West, 54; Naco, 4,630; New Orleans, 61,822; New York, 2,151,530; Nogales, 22,575; Puerto Rico (all ports), 305,941.	2, 571, 447
Prickly pear.....pounds..	Calexico, 8; El Paso, 290; Laredo, 1,880; Nogales, 4.....	2, 182
Pumpkin.....do.....	Brownsville, 975; Calexico, 1,527; Douglas, 3,358; Eagle Pass, 546; Key West, 6,043; Laredo, 1,399; Naco, 746; New Orleans, 350; New York, 175,960; Nogales, 91; Rio Grande City, 16.	191,011
Purslane.....do.....	Calexico, 214; Douglas, 270; Nogales, 762.....	1, 246
Radish.....do.....	Calexico, 2,681; Douglas, 239; Eagle Pass, 29; El Paso, 63,423; Naco, 43; Nogales, 6,912.	73, 327
St. Johns bread.....do.....	New York, 814,100.....	814, 100
Salsify.....do.....	Calexico, 26; San Ysidro, 1,140.....	1, 166
Spinach.....do.....	Calexico, 1,179; Douglas, 1,377; El Paso, 28,590; Naco, 626; New York, 88; Nogales, 16,895.	48, 755
Squash.....do.....	Calexico, 2,916; Douglas, 7,617; Eagle Pass, 1,049; El Paso, 39,174; Laredo, 84,213; Naco, 712; New York, 21,056; Nogales, 21,686; Rio Grande City, 12; San Ysidro, 118.	178, 553
Strawberry:		
Natural.....do.....	Nogales, 20.....	20
Frozen.....do.....	New York, 34.....	34
Sweetpotato.....do.....	Hawaii (all ports), 9,600; Puerto Rico (all ports), 54.....	9, 654
Swiss chard.....do.....	El Paso, 2,872; Nogales, 30.....	2, 902
Tamarind bean pod.....do.....	Calexico, 3; El Paso, 110; Laredo, 200; New Orleans, 1,530; New York, 67,302; Nogales, 2.	69, 147
Tangerine.....do.....	New York, 125.....	125
Tomato.....do.....	Boston, 177,477; Brownsville, 4,310; Buffalo, 116,586; Calexico, 8,898; Del Rio, 4,508; Douglas, 15,192; Eagle Pass, 40,779; El Paso, 144,652; Hidalgo, 1,847; Key West, 375,496; Laredo, 955,136; Los Angeles, 7,839,176; Miami, 19,500; Naco, 2,588; New Orleans, 687,184; New York, 22,270,695; Niagara Falls, 20,660; Nogales, 23,605,508; Puerto Rico (all ports), 92,650; Rio Grande City, 3; Roma, 5; San Diego, 17,280; San Francisco, 1,236,723; San Ysidro, 1,530; Seattle, 78,000.	57, 716, 383
Turnip.....do.....	Boston, 150; Calexico, 78; Douglas, 780; Eagle Pass, 5; El Paso, 206,289; Naco, 29; New York, 336; Nogales, 7,334.	215, 001
Vaccinium (cranberry, etc.):		
Natural.....pounds..	Boston, 25,830; New York, 228,387.....	254, 217
Frozen.....do.....	Boston, 434,830; New York, 1,081,730.....	1, 516, 560
Water caltrop.....do.....	Boston, 500; Hawaii (all ports), 5,480; New York, 1,305; San Francisco, 6,700.	13, 985
Waterchestnut.....do.....	Boston, 69,214; Buffalo, 88,433; Chicago, 64,000; Cleveland, 7,071; Detroit, 31,500; Hawaii (all ports), 120,262; Los Angeles, 46,240; New York, 312,776; Niagara Falls, 55,743; Portland, 8,600; San Francisco, 505,653; Seattle, 282,418.	1, 591, 910
Watercress.....do.....	Calexico, 78; Douglas, 752; Naco, 138; Nogales, 4,270.....	5, 238
Waterlily root.....do.....	Boston, 2,372; New York, 61,783; Niagara Falls, 500; Portland, 360; San Francisco, 7,800; Seattle, 11,529.	84, 344
Watermelon.....do.....	Brownsville, 137,080; Calexico, 495,319; Douglas, 670; El Paso, 805; Hidalgo, 173,640; Mercedes, 20,700; Naco, 352; New Orleans, 45,315; New York, 185,170; Nogales, 281,113; Rio Grande City, 1,437; Roma, 700.	1, 342, 301
Yam.....do.....	Hawaii (all ports), 42,545.....	42, 545
Yam bean root.....do.....	Hawaii (all ports), 3,220; El Paso, 969; Los Angeles, 1,300; New York, 3,100; San Francisco, 12,890.	21, 479

PLANTS AND PLANT PRODUCTS ENTERED FOR EXPORTATION OR FOR TRANSPORTATION
AND EXPORTATION

In addition to the regulated imports for consumption entry recorded in tables 15 to 29, this Bureau supervised the entry under permit, either for exportation or for transportation and exportation, of considerable quantities of plants and plant products, as follows: Flower bulbs, corms, and tubers, 1,285,690; fruit trees, 54,128; cacti and succulents, 21,711; orchids, 495; miscellaneous plants, 5,521; acorns, 379,575 pounds; apples, 163,891 pounds; bananas, 6 bunches; beans (string), 195,300 pounds; cherries, 700 pounds; chestnuts, 43 pounds; cipollini, 190 pounds; *Citrus medica*, 180 pounds; eggplants, 35,758 pounds; garlic, 2,452,816 pounds; ginger, 683 pounds; grapes, 61,853 pounds; grapefruit, 10,549,001 pounds; husk tomatoes, 1,608 pounds; kudzu, 754 pounds; lemons, 7,849,514 crates; lily bulbs (edible), 955 pounds; limes (sour), 7,970 pounds; mangoes, 50 pounds; melons, 535,502 pounds; nectarines, 1,400 pounds; onions, 5,916,823 pounds; oranges, 1,167,841 pounds; peas, 1,330,176 pounds; peaches, 18,397 pounds; peppers, 84,409 pounds; pineapples, 103,997 crates; plums, 1,336 pounds; potatoes, 664,501 pounds; pumpkins, 963 pounds; St. Johns bread, 110 pounds; tamarind bean pods, 44 pounds; tangerines, 1,600 pounds; tomatoes, 13,203,197 pounds; waterchestnuts, 2,300 pounds; waterlily roots, 679 pounds; watermelons, 215,770 pounds; yam bean roots, 200 pounds; corn, 818,820 pounds; cotton, 74,603 bales and 15 packages, including 920 bales and 5 packages of linters; cottonseed cake, 1,665,950 pounds; cotton waste, 156 bales and 4 packages; seed or paddy rice, 9,471 pounds.

MARITIME-PORT INSPECTION

SHIP INSPECTION

The inspection of ships from foreign countries and from Hawaii and Puerto Rico has been continued along the lines described in previous annual reports.

The inspection at ports in California, Florida, Hawaii, and certain ports in Puerto Rico has been performed by State and Territorial officials serving as collaborators of the Bureau of Plant Quarantine at a very small cost to the Department.

A record by ports of the ship inspection appears in table 30.

TABLE 30.—Ships inspected, fiscal year 1933

Port	From foreign ports												From Hawaii						From Puerto Rico						From United States ports via Panama Canal		
	Direct			Via United States ports			Via Hawaii			Via Puerto Rico			Direct			Via United States ports			Direct			Via United States ports			Arrived	Inspected	With con- traband
	Arrived	Inspected	With con- traband	Arrived	Inspected	With con- traband	Arrived	Inspected	With con- traband	Arrived	Inspected	With con- traband	Arrived	Inspected	With con- traband	Arrived	Inspected	With con- traband	Arrived	Inspected	With con- traband	Arrived	Inspected	With con- traband			
Baltimore.....	374	368	289	543	535	335	1	1	0	0	0	0	3	3	1	26	24	2	7	7	4	32	32	20	172	169	25
Bellingham.....	259	109	26	0	0	0	0	0	0	0	0	0	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0
Boston.....	1,212	1,208	637	274	272	117	0	0	0	0	0	0	0	0	0	20	20	0	15	15	3	1	1	1	205	205	2
Brunswick ¹	6	6	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Charleston.....	111	111	90	99	98	57	0	0	0	0	0	0	0	0	0	0	0	0	21	21	6	5	5	1	23	23	3
Chicago.....	10	10	7	4	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corpus Christi.....	40	40	38	106	106	56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	0	22	22	1
Galveston.....	285	284	264	551	545	304	0	0	0	0	0	0	0	0	0	0	0	0	4	4	2	4	4	0	5	5	0
Gulfport ²	6	6	6	96	93	32	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	5	5	1	1	1	1
Honolulu ³	179	179	92	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91	91	1
Houston.....	176	176	24	704	704	1	0	0	0	2	2	1	14	14	0	1	1	0	10	10	0	30	30	0	97	97	0
Jacksonville ³	94	94	23	114	114	1	1	0	0	1	0	0	0	0	0	1	1	1	9	9	1	6	6	1	32	32	0
Key West ³	451	451	175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miami ³	582	582	176	4	4	0	0	0	0	1	1	1	0	0	0	0	0	0	6	6	1	0	0	0	0	0	0
Mobile.....	179	179	151	340	340	201	0	0	0	0	0	0	0	0	0	4	4	0	16	16	11	13	13	1	60	60	2
New Orleans.....	963	963	599	421	407	235	1	1	1	0	0	0	16	16	9	10	10	3	25	25	3	5	5	0	59	59	1
Newport News ³	51	16	16	340	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
New York.....	3,324	3,266	2,277	865	694	321	6	6	3	116	114	95	1	1	0	32	27	7	158	158	109	19	6	2	212	197	2
Norfolk.....	243	239	117	688	644	213	0	0	0	0	0	0	0	0	0	1	1	0	9	9	0	28	28	2	90	85	3
Pensacola ³	55	55	12	162	162	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0
Philadelphia.....	636	635	423	835	828	560	0	0	0	0	0	0	7	7	5	15	15	1	41	41	30	1	1	1	196	189	12
Port Arthur.....	209	204	72	261	253	30	0	0	0	0	0	0	0	0	0	0	0	0	6	6	3	0	0	0	13	13	1
Portland, Oreg.....	68	68	30	382	382	117	0	0	0	0	0	0	2	2	1	2	2	0	0	0	0	0	0	0	386	386	0
Providence ⁴	49	9	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Puerto Rico (all ports).....	1,159	1,159	641	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	25	11
San Diego ³	778	778	18	28	28	0	2	2	0	0	0	0	23	23	2	1	1	0	0	0	0	0	0	0	148	148	21
San Francisco ³	481	481	99	585	585	75	105	105	73	0	0	0	160	160	23	9	9	0	0	0	0	0	0	0	520	520	6
San Pedro ³	1,187	1,187	268	545	545	39	77	77	34	1	1	0	47	47	5	19	19	0	2	2	0	0	0	0	721	721	7
Savannah.....	65	65	56	128	105	78	0	0	0	0	0	0	0	0	0	1	1	0	13	13	9	1	1	0	22	10	1
Seattle.....	1,313	1,173	193	257	257	167	5	5	0	0	0	0	4	4	1	10	10	0	0	0	0	0	0	0	79	79	3
Tampa ³	186	186	13	238	238	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	13	13	0	0	0	0
West Palm Beach ³	108	108	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total.....	14,839	14,395	6,851	8,583	7,967	2,960	198	197	111	121	118	97	279	279	48	154	147	14	343	343	182	169	156	30	3,183	3,138	103

¹ Work handled by inspector stationed at Savannah, Ga.² Work handled by inspectors stationed at Mobile, Ala.³ Collaborators stationed at these ports.⁴ Work handled by inspectors stationed at Boston, Mass.

NOTE.—The foreign-ship arrivals do not in all cases agree with customs figures. Foreign ships may put in for bunkers and be inspected by inspectors of the Bureau of Plant Quarantine but not entered by customs. On the other hand, ships entered at certain small subports are included in customs records but not in this report.

CARGO INSPECTION

All importations of plants and plant products subject to quarantine restrictions were inspected at the port of entry or the port of first arrival and a record of such importations by port appears in table 31.

TABLE 31.—*Inspection of shipments of plants and plant products offered for entry, fiscal year 1933*

Port	Ship-ments in-spect-ed and en-tered under permit	Ship-ments refused entry	Port	Ship-ments in-spect-ed and en-tered under permit	Ship-ments refused entry	Port	Ship-ments in-spect-ed and en-tered under permit	Ship-ments refused entry
Baltimore.....	200	0	Hidalgo.....	214	0	Port Huron ¹	53	3
Bellingham.....	81	0	Honolulu ¹	491	139	Portland, Oreg....	19	0
Blaine.....	15	0	Houston.....	201	0	Presidio.....	9	0
Boston.....	1,033	1	Key West ¹	587	0	Providence ²	19	0
Brownsville.....	437	0	Laredo.....	2,193	0	Puerto Rico (all ports).....	637	0
Buffalo.....	299	1	Mercedes.....	9	0	Rio Grande City..	6	0
Calexico.....	353	0	Miami ¹	73	1	Roma.....	27	0
Charleston.....	61	1	Mobile.....	112	4	San Francisco ¹ ..	1,227	10
Chicago.....	19	1	Naco.....	5	0	San Pedro ¹	542	2
Del Rio.....	102	0	New Orleans.....	1,684	3	San Ysidro.....	153	0
Detroit.....	333	59	New York.....	11,128	22	Savannah.....	75	0
Douglas.....	41	0	Nogales.....	2,681	4	Seattle.....	233	1
Eagle Pass.....	351	1	Norfolk.....	216	1	Tampa ¹	864	0
El Paso.....	5,007	0	Pensacola ¹	2	0			
Fabens.....	1	0	Philadelphia.....	364	15			
Galveston.....	282	3	Port Arthur.....	2	0	Total.....	32,441	272

¹ Collaborators are stationed at these ports.
² Work handled by inspectors stationed at Boston, Mass.

In addition to the importations credited to the Mexican border ports there were several thousand importations which were so small that no duty was assessed by customs and no entry made.

Disinfection is required of certain commodities as a condition of entry and of other commodities when inspection reveals the presence of injurious insects or plant diseases. The following plant material was treated under supervision of inspectors of this Bureau during the fiscal year: Cotton, 108,648 bales (including 212 bales of linters) and 6,675 cotton samples; cotton waste, 2,665 bales; bagging 1,818 bales; chestnuts, 15,323 cases; tree seeds, 3,909 pounds and 16 packages; miscellaneous plant material, 984 packages; narcissus bulbs imported under special permit, 1,076,356; and bulbous iris, 1,106,428.

It has also been necessary for inspectors at several ports to devote considerable time to the inspection of miscellaneous cargoes in order to establish the true status of the material and to supervise the cleaning by importers of products contaminated with objectionable material such as soil.

The demand for inspection of docks and ships for the presence of insects injurious to flour decreased considerably over the previous fiscal year. At Galveston 8 ship inspections were made, at Houston 24 ship inspections, and at New Orleans 23 ship and 1 dock inspections.

AIRPLANE INSPECTION

Airplanes from foreign countries were inspected at the following 10 ports of entry: Brownsville, El Paso, and Laredo, Tex.; Nogales, Ariz.; Calexico and San Diego, Calif.; Miami and West Palm Beach, Fla.; San Juan, P.R.; and Seattle, Wash. A total of 3,427 airplanes was inspected during the year, and 626 interceptions of prohibited plant material were made.

FOREIGN PARCEL-POST INSPECTION

Through cooperation with the customs and post-office officials, all mail packages from foreign countries which are found to contain plants or plant products are referred to inspectors of the Bureau for examination. Such packages arriving at

ports of entry where there are no representatives of the Bureau are forwarded by the postal officials to the nearest port at which a plant quarantine inspector is stationed.

Table 32 indicates by port the number and disposition of foreign-mail packages inspected during the fiscal year.

TABLE 32.—*Number of inspections of foreign parcel-post packages, fiscal year 1933*

Port	In-spected	Re-fused entry (entire or in part)	Divert-ed to Wash-ington	Port	In-spected	Re-fused entry (entire or in part)	Divert-ed to Wash-ington
Baltimore.....	1,408	96	71	Naco.....	42	1	0
Boston.....	2,206	139	380	New Orleans.....	62	25	30
Brownsville.....	584	5	0	New York.....	1,905	567	437
Buffalo.....	44	27	1	Nogales.....	5	1	2
Chicago.....	3,952	493	56	Norfolk.....	1	0	1
Detroit.....	4,703	202	206	Philadelphia.....	7,822	354	166
Douglas.....	15	0	0	Portland.....	25	2	10
Eagle Pass.....	171	0	0	Presidio.....	37	0	0
El Paso.....	467	108	37	Puerto Rico (all ports)...	19	11	0
Honolulu ¹	1,010	94	2	St. Paul ³	2,978	282	82
Houston.....	2	0	0	San Diego ¹	32	0	0
Jacksonville ¹	350	19	93	San Francisco ¹	4,284	344	0
Laredo.....	492	33	11	Seattle.....	601	68	1
Los Angeles ^{1 2}	4,799	185	0	Tampa ¹	1	1	0
Miami ¹	36	30	4				
Mobile.....	13	2	0	Total.....	38,066	3,089	1,590

¹ Collaborators are stationed at these ports.

² 372 packages were diverted to San Francisco for treatment.

³ Records cover the period October 1932 to June 1933, inclusive.

MEXICAN BORDER SERVICE

The movement of railway cars from Mexico continued to decline over the last fiscal year. A total of 13,302 freight cars was inspected in the Mexican railway yards. Of these, 12,448 entered the United States, 3,090 being fumigated as a condition of entry. Four hundred and ninety-nine cars were found to be contaminated with cottonseed and were required to be cleaned before entry was permitted. The usual fee of \$4 was collected for each car fumigated, and all fees collected were covered into the Treasury as miscellaneous receipts.

A summary of the railway-car inspection and fumigation is given in table 33.

TABLE 33.—*Inspection and fumigation of railway cars crossing the border from Mexico, fiscal year 1933*

Port	Cars in-spected	Cars with cotton-seed	Cars en-tered	Cars fu-migated	Fees col-lected
Brownsville.....	240	31	183	22	\$88
Douglas.....	377	11	377	14	56
Eagle Pass.....	1,104	92	1,036	331	1,400
El Paso.....	2,303	44	2,151	1,460	1,692
Laredo.....	4,704	207	4,375	1,528	6,144
Naco.....	514	7	514	6	24
Nogales.....	4,046	106	3,798	726	3,000
Presidio.....	14	1	14	3	12
Total.....	13,302	499	12,448	3,090	\$12,416

¹ Includes 3 cars not from Mexico.

² The apparent discrepancy in fees collected and the number of cars fumigated may be explained by the fact that it is customary for the railroads to purchase fumigation coupons in advance.

In addition to the freight cars listed in table 33, 2,525 Pullman and passenger coaches crossed the border and were inspected.

Plant-quarantine inspectors on the Mexican border take an active part in cooperation with the Customs Service, in the inspection of vehicles, baggage, personal effects, and express packages from Mexico. Approximately 3,500,000 vehicles crossed the border from Mexico during the fiscal year, and a total of 100,833 pieces of baggage was examined. The inspection of these vehicles and baggage resulted in the interception of a large quantity of prohibited plant material. A record of such interceptions appears in table 38.

While there was a decided increase in the small lots of fruits and vegetables brought over for local consumption, the carload shipments of fruits and vegetables were considerably below normal. One thousand six hundred and one cars of tomatoes, 673 cars of green peas, 588 cars of bananas, and 287 cars miscellaneous fruits and vegetables entered at the various ports.

INSPECTION IN PUERTO RICO AND HAWAII

In addition to the enforcement of the foreign-plant quarantines and regulatory orders, inspectors stationed in Puerto Rico also enforce the provisions of Quarantine No. 58. This involves the inspection of fruits and vegetables in the fields, in packing houses, and on the docks, and all shipments of such products moving to the mainland have been certified as free from pests.

Parcel-post packages originating on the island and destined for points on the mainland are also inspected. A total of 892 such packages was inspected during the year, and 95 were found to contain prohibited plant material and were returned to the sender.

Insular quarantine inspectors rendered valuable assistance in the enforcement of the foreign-plant quarantines and regulatory orders.

A record by months of the number of containers of fruits and vegetables inspected and certified for shipment to the mainland appears in table 34.

Inspectors stationed in Hawaii are engaged principally with the enforcement of Quarantine No. 13, on account of the Mediterranean fruit fly and the melon fly. Inspections were made in the fields, packing sheds, and on the docks of such fruits and vegetables as are permitted to move to the mainland.

The inspection of parcel-post packages originating in the Hawaiian Islands and destined for points on the mainland was continued throughout the year. A total of 75,962 packages were opened and examined; 89,770 packages were inspected without opening, and 103 packages were found to contain prohibited plant material.

As an accommodation to travelers between Hawaii and the mainland, it has been the practice for some years to inspect and seal baggage in Honolulu, thus eliminating delay incident to the inspection of baggage at destination. During the year 2,157 pieces of baggage were inspected and sealed under this arrangement.

A record of the number of containers of fruits and vegetables inspected and certified for shipment to the mainland appears in table 35.

TABLE 34.—Number of containers of fruits and vegetables moving from Puerto Rico to the mainland, inspected and certified under Quarantine No. 58, fiscal year 1933

Item	Inspected and certified during—												Total
	July	August	Septem-ber	October	Novem-ber	Decem-ber	January	February	March	April	May	June	
Avocados.....	1	6	6	1									14
Bananas (bunches).....	47	52						1	1			2	103
Celery root.....	15												15
Chayotes.....	5		4	1		21	43	43	22	1			140
Citrons.....		2		2		1			1	8			14
Cucumbers.....			3		80	3, 527	6, 178	8, 137	1, 965	672			20, 562
Cucumbers (Angola).....								4					4
Dasheens.....	15					9	42	76	54	6			202
Eggplants.....							10	103	316	346			775
Ginger root.....	58	14	4	3		1	11		1	1		27	120
Grapefruit.....	15, 509	30, 727	125, 034	83, 175	5, 555	2, 864	401	2, 999	1, 536	1, 269	595	186	269, 850
Lemons.....		14		25	14								53
Lerenes.....								2		7			9
Lima beans.....						61	101	92	116	1			371
Limes.....	36	193	136	2	11	11		1			5	26	421
Mixed (fruits and vegetables).....	2	2		4	1	21	12	4	5	3			54
Oranges.....	74	195	300	2, 015	2, 044	4, 794	1, 459	2, 352	459	4	2	1	13, 699
Oranges (sour).....	1						385						386
Peas (garden).....						212	19	171	170	56			628
Peppers.....	26	11	8		5	277	657	624	448	64	17	2	2, 139
Peppers (hot).....						2	2	21	21	17	14		77
Pigeon peas.....					66	1, 884	1, 448	1, 122	427	7			4, 954
Pineapples.....	14, 426	9, 285	2, 773	1, 769	4, 314	4, 437	2, 928	16, 192	39, 960	68, 809	170, 400	58, 366	393, 659
Potatoes.....												1	1
Pumpkins.....	65	23	67	30	6	129	82	15	31	8	20		476
Quenepas.....	67	30											97
Squash.....	3				10	908	1, 532	1, 072	117	1			3, 643
String beans.....						6	13	103	21				143
Sweet corn.....							1	2					3
Tamarinds.....								2					5
Tangerines.....					152	8	122			3			282
Tomatoes.....						967	966	1, 318	1, 561	358			5, 170
Watercress.....								1					1
Watermelons.....						19	7		32	2		14	74
Yautias.....	16												16
Total.....	30, 366	40, 554	128, 335	87, 027	12, 258	20, 159	16, 419	34, 457	47, 264	71, 643	171, 053	58, 625	718, 160
Certificates.....	243	239	418	253	101	231	187	191	138	151	224	180	2, 556

TABLE 35.—*Number of containers of fruits and vegetables inspected and certified for shipment from Hawaii to the mainland, fiscal year 1933*

Month	Bananas ¹	Pine-apples	Taro	Coco-nuts	Ginger root	Lily root ²	Permits issued
July.....	3,606	5,758	17	69	0	87	118
August.....	3,357	2,256	301	7	119	102	101
September.....	5,404	3,131	195	178	107	103	107
October.....	5,834	2,085	0	48	17	97	75
November.....	8,434	3,125	2	349	187	152	95
December.....	6,901	4,046	51	278	420	198	121
January.....	6,738	4,209	0	239	20	156	89
February.....	7,686	5,431	7	8	26	130	99
March.....	11,133	6,468	1	4	216	159	110
April.....	6,253	4,132	0	111	174	118	96
May.....	7,788	3,473	17	74	245	92	127
June.....	5,303	4,531	0	13	102	93	136
Total.....	78,437	48,645	591	1,378	1,633	1,487	1,274

¹ Bunches.² This edible root (*Nelumbium nelumbo*) is also known to the trade as Lotus root.

NOTE.—In addition to the fruits and vegetables listed above, inspectors in Hawaii certified 2,915 crates of potatoes, 12 crates of onions, 3 crates of asparagus, and 5 crates of gobo for shipment to the mainland.

INSPECTION OF SPECIAL-PERMIT AND DEPARTMENTAL PLANT MATERIAL

As in previous years, all plants imported under special permit have been inspected at ports of entry designated for such material. A tabular record of special-permit importations is presented in tables 19 to 22, inclusive. The majority of such special-permit importations have been, as in former years, inspected at Washington, D.C., and these together with departmental importations and distributions from Washington, including domestic plants entering and leaving the District of Columbia, are inspected and certified for shipment at the Department inspection house, in the nursery, or in freight, express, or post offices. A summary of the inspections made at Washington, D.C., is given in table 36.

TABLE 36.—*Summary of plants and plant products offered for inspection in the District of Columbia, fiscal year 1933*

Material inspected	Foreign	Domestic	Fumigated	Otherwise treated	Infested with insects	Infected with diseases
Lots of seeds (departmental).....	2,883	4,035	2,981	573	240	84
Plants, cuttings, bulbs, roots, rhizomes, etc. (departmental).....	65,606	123,169	68,597	30,039	¹ 569	¹ 249
Miscellaneous unclassified material, other than plants and seeds (departmental).....	105	192	50	139	4	1
Shipments of plants under regulation 14, Quarantine No. 37 (commercial).....	847	-----	130	106	193	271
Shipments of plants and plant products under regulations 3 and 15, Quarantine No. 37 (commercial).....	815	-----	306	240	34	170
Containers of domestic plants other than departmental (mail, express, freight, and truck).....	-----	8,820	-----	-----	-----	-----
Shipments of plants for distribution by U. S. Botanic Garden.....	-----	368	1	368	94	-----
Shipments of plants by private individuals.....	-----	4,178	18	338	56	317
Interceptions of plants and plant products referred to Washington.....	950	-----	382	196	67	21
Cotton samples referred to Washington.....	5,336	-----	5,336	-----	-----	-----

¹ Lots.

An effort is made to inspect, in the field, plants imported under regulation 14 of Quarantine No. 37 during at least two growing seasons to determine their freedom from plant pests, particularly plant diseases, which may have escaped detection or which were in such an early stage of development as to make detection impossible at the initial inspection at the time of entry, prior to shipment to the field. Only the more recent of the importations shown in table 22 are still under the observation of the Department. During the year field inspections were made of imported plants and their increase, a total of approximately 26,000,000 plants. As a result of inspections in 1933 and those of preceding

years, a total of 36,821,485 plants were released from further observation. This total represents imported plant material and its increase produced during the two or more growing seasons it was under observation, which was found to be apparently free of important plant pests likely to become established in this country.

During the fiscal year 650 collections of plant pests were sent in for verification and determination, 461 of which were diseases and 189 insects. Among the more interesting pests found were the following: Nematodes—*Tylenchus dipsaci* in bulbous iris in California, Michigan, New York, and North Carolina and in narcissus in Maryland, New York, North Carolina, and Washington, root knot (*Heterodera marioni*) in bulbous iris Wedgewood, a new host; diseases—*Botrytis convoluta* on *Iris susiana* in California, *Hemileia oncidii* on orchid in Hawaii, mosaic or mosaiclike symptoms on azalea, camellia, dahlia, *Eremurus* spp., iris, narcissus, orchid, peony, rhododendron, and tigridia, *Puccinia iridis* on *Iris* spp. in California, and on *Iris* sp. in Louisiana, *Stagonospora curtisii* on *Nerine* spp., *Uredo nigropunctata* on orchid in Maryland, and *Urocystis colchici* in Delaware, Ohio, Pennsylvania, and Washington on *Colchicum* spp.; insects—*Bregmatothrips iridis* (thrips) on iris, *Eumerus* sp. (Syrphidae) in narcissus and *Valotta purpurea* (Scarboro-lily), *Frankliniella* sp. (thrips) on *Hemerocallis* sp. (daylily), *Lepidosaphes tuberculata* (Coccidae) on orchid, *Merodon equestris* (narcissus-bulb fly) in narcissus, and *Taeniothrips gladioli* (gladiolus thrips) on gladiolus and *Tritonia* sp.

INSPECTION OF PLANT-INTRODUCTION AND PROPAGATING GARDENS

As heretofore, plants grown and distributed by the Bureau of Plant Industry from its plant-introduction and propagating gardens were inspected and certified prior to shipment. Plants shipped from Mandan, N.Dak., Chapman Field, Fla., and Chico, Calif., were inspected by officials of the States concerned cooperating with this Bureau. Those distributed from Savannah, Ga., were examined by an inspector of this Bureau. Table 37 indicates the number of plants inspected and certified for distribution.

TABLE 37.—Number of plants, bud sticks, cuttings, tubers, roots, and shipments of seeds examined for distribution from plant-introduction and propagating gardens, fiscal year 1933

Station	Plants	Bud sticks, cuttings, tubers, and roots	Shipments of seeds
Bell.....	27, 949	421	1
Chico.....	16, 012	532	21
Chapman Field.....	6, 021	181	94
Savannah.....	1, 027	22	-----
District of Columbia.....	5, 838	50, 449	4, 298
Mandan, N.Dak.....	253, 210	-----	-----
Beltsville.....	38	6, 642	-----
Total.....	310, 095	58, 247	4, 414

INTERCEPTIONS OF PROHIBITED PLANTS AND PLANT PRODUCTS

A record of the number of interceptions of prohibited plants and plant products made by inspectors and collaborators of the Bureau at all ports appears in table 38. Many of these interceptions were found to harbor insect pests and plant diseases, and many others, while no infestation or infection was noted, must be considered potentially dangerous since they came from countries where pests not present in this country are known to occur. For example, 1,723 interceptions, representing 21,424 individual units of known hosts of the Mediterranean fruit fly, from countries where that insect is reported to occur, were made.

Interceptions made at foothridges, ferries, and crossings at the Mexican and Canadian border ports have all been listed as having been taken from baggage.

TABLE 38.—*Number of interceptions of contraband plants and plant products, fiscal year 1933*

Port	In bag- gage	In cargo	In mail	In quar- ters	In stores	Port	In bag- gage	In cargo	In mail	In quar- ters	In store
Baltimore.....	31	0	92	36	59	New Orleans.....	314	8	8	378	81
Bellingham.....	23	0	0	0	2	New York.....	1,370	322	572	82	19
Blaine.....	1,745	0	0	0	0	Nogales.....	2,312	0	1	0	0
Boston.....	331	1	194	103	3	Norfolk.....	10	0	0	105	65
Brownsville.....	1,965	0	6	0	0	Pensacola ⁵	1	0	0	4	14
Brunswick ¹	0	0	0	0	1	Philadelphia.....	37	21	467	82	118
Buffalo.....	442	0	27	0	0	Port Arthur ⁶	1	0	0	25	12
Callexico.....	2,333	0	0	0	0	Port Huron ⁵	239	3	0	0	0
Charleston.....	3	1	0	116	9	Portland, Oreg....	2	0	2	1	7
Chicago.....	0	4	555	0	16	Presidio.....	131	0	0	0	0
Columbus ²	83	0	0	0	0	Providence ⁷	63	1	0	0	0
Corpus Christi....	0	0	0	7	0	Puerto Rico (all ports).....	162	1	0	3	1
Del Rio.....	498	0	0	0	0	Rio Grande City....	60	0	0	0	0
Detroit ³	564	59	245	0	0	Roma.....	278	0	0	0	0
Douglas.....	508	0	0	0	0	St. Paul ⁸	0	0	203	0	0
Eagle Pass.....	1,994	0	0	0	0	San Diego ⁵	10	7	0	8	42
El Paso.....	6,192	0	118	0	0	San Francisco ⁵	284	29	50	457	148
Fabens.....	176	0	0	0	0	San Pedro ⁵	33	6	0	18	51
Galveston.....	0	4	0	54	19	San Ysidro.....	6,775	0	0	0	0
Gulfport ⁴	0	0	0	5	3	Sasabe.....	177	0	0	0	0
Hidalgo.....	722	0	0	0	0	Savannah.....	1	0	0	41	4
Honolulu ⁵	724	145	108	0	4	Seattle.....	105	1	51	0	1
Houston.....	35	2	0	8	25	Tampa ⁵	2	0	1	5	11
Jacksonville ⁵	0	0	19	6	25	West Palm Beach ⁵	0	0	0	11	20
Key West ⁵	375	0	0	92	14	Ysleta.....	244	0	0	0	0
Laredo.....	3,872	0	18	0	0	Zapata.....	17	0	0	0	0
Los Angeles ⁵	0	0	114	0	0						
Mercedes.....	343	0	0	0	0						
Miami ⁵	624	14	31	432	36						
Mobile.....	7	4	2	62	53						
Naco.....	276	0	1	0	0						
						Total.....	36,494	633	2,885	2,141	863

¹ Work handled by inspector stationed at Savannah, Ga.² This port closed June 14, 1933.³ Interceptions in baggage are recorded at 1 customs station only, and the number reported represents only part of the total for Detroit.⁴ Work handled by inspectors stationed at Mobile, Ala.⁵ Collaborators stationed at these ports.⁶ Includes interceptions made at Beaumont and Sabine, Tex., and Lake Charles, La.⁷ Work handled by inspectors stationed at Boston.⁸ Records cover the period October 1932 to June 1933, inclusive.

PESTS INTERCEPTED

During the fiscal year the inspectors and collaborators of the Bureau collected from foreign plants and plant products insects belonging to 958 recognized species and others distributed among 789 genera and families, fungi and bacteria belonging to 175 recognized species, nematodes belonging to 10 recognized species, and numbers of interceptions of diseases caused by fungi, bacteria, nematodes, or other agents that could be referred to family, genus, or other group only. Many of these interceptions were of considerable economic or scientific importance.

A total of 21,190 interceptions of insects and plant diseases were made during the fiscal year 1933. A summary of these interceptions appears in table 39.

TABLE 39.—*Number of interceptions of insects and plant diseases made during fiscal year 1933*

Port	Cargo		Stores		Baggage		Quarters		Mail		Total	
	In-sects	Dis-eases	In-sects	Dis-eases	In-sects	Dis-eases	In-sects	Dis-eases	In-sects	Dis-eases	In-sects	Dis-eases
Baltimore.....	25	8	77	113	10	5	26	9	20	8	158	143
Bellingham.....	14	7	16	5	0	0	0	0	0	0	30	12
Blaine.....	1	0	0	0	20	4	0	0	0	0	21	4
Boston ¹	94	71	279	264	94	27	64	15	64	39	595	416
Brownsville.....	24	1	0	0	273	9	34	0	0	0	331	10
Buffalo.....	1	29	0	0	0	1	0	0	2	0	3	30
Calexico.....	12	2	0	0	10	2	0	0	0	0	22	4
Charleston.....	420	3	28	77	0	0	4	8	0	0	452	88
Chicago.....	8	4	0	2	0	0	0	1	15	10	23	17
Columbus ²	0	0	0	0	0	0	0	0	0	0	0	0
Corpus Christi.....	1	0	27	45	0	0	2	0	0	0	30	45
Del Rio.....	0	0	0	0	2	0	0	0	0	0	2	0
Detroit.....	25	123	0	0	1	0	0	0	23	27	49	150
Douglas.....	4	2	0	0	11	3	0	0	0	0	15	5
Eagle Pass.....	42	9	0	0	77	30	0	0	0	0	119	39
El Paso.....	60	33	0	0	133	162	1	0	5	7	199	202
Fabens.....	0	0	0	0	1	2	0	0	0	0	1	2
Galveston.....	16	1	60	59	0	0	1	3	0	0	77	63
Hawaii.....	472	1	10	0	59	0	16	0	280	6	837	7
Hidalgo.....	1	0	0	0	10	0	0	0	0	0	11	0
Houston.....	16	2	5	16	2	2	0	0	0	0	23	20
Jacksonville ^{3 4}	3	1	9	161	0	0	0	1	8	4	20	167
Key West ^{3 4}	0	0	6	4	22	0	2	2	0	0	30	6
Laredo.....	229	8	1	0	87	2	0	0	0	0	317	10
Los Angeles ^{3 4}	13	0	0	0	0	0	0	0	39	0	52	0
Miami ^{3 4}	7	1	15	2	63	1	59	1	2	2	146	7
Mobile ⁵	264	12	121	123	7	2	15	3	0	0	407	140
Naco.....	4	1	0	0	36	8	0	0	0	0	40	9
New Orleans.....	334	47	101	155	31	7	75	16	11	1	552	226
New York.....	671	259	234	140	206	43	22	1	15	21	1,148	464
Nogales.....	1,477	801	4	6	123	48	0	1	0	1	1,604	857
Norfolk.....	17	11	62	191	0	0	27	15	0	0	106	217
Pensacola ^{3 4}	4	1	54	93	0	0	7	2	0	0	65	96
Philadelphia.....	398	287	394	828	57	19	87	70	364	191	1,300	1,395
Port Arthur ⁶	7	1	6	4	0	0	2	0	0	0	15	5
Portland, Oreg.....	4	1	2	3	0	0	1	0	0	0	7	4
Presidio.....	5	0	0	0	2	2	0	0	0	0	7	2
Rio Grande.....	0	0	0	0	1	0	0	0	0	0	1	0
Roma.....	0	0	0	0	3	0	0	0	0	0	3	0
St. Paul.....	0	0	0	0	0	0	0	0	4	0	4	0
San Diego ^{3 4}	4	0	14	1	3	0	4	0	4	0	29	1
San Francisco ^{3 4}	2,576	33	449	353	313	8	420	9	317	42	4,075	445
San Juan.....	42	6	12	0	3	2	4	0	2	0	63	8
San Pedro ^{3 4}	326	0	159	5	66	0	24	0	0	0	575	5
San Ysidro.....	5	2	0	0	8	3	0	0	0	0	13	5
Sasabe.....	0	0	0	0	1	0	0	0	0	0	1	0
Savannah.....	16	0	18	81	0	1	9	2	0	0	43	84
Seattle.....	86	30	45	40	38	12	42	21	10	6	221	109
Tampa ^{3 4}	0	0	0	12	0	1	0	0	0	0	0	13
Thayer.....	0	0	0	0	8	0	0	0	0	0	8	0
Washington, D.C.....	274	256	0	0	0	1	0	0	794	466	1,068	723
West Palm Beach ^{3 4}	0	0	0	3	0	0	4	1	0	0	4	4
Ysleta.....	0	0	0	0	1	2	0	0	0	0	1	2
Zapata.....	0	0	0	0	1	0	0	0	0	0	1	0
Miscellaneous.....	1	0	0	0	0	0	0	0	3	1	4	1
Total.....	8,003	2,054	2,208	2,786	1,783	409	952	181	1,982	832	14,928	6,262

¹ Includes interceptions at Providence, R.I.² Closed June 10, 1933.³ Collaborators stationed at these ports.⁴ California and Florida interception figures refer to numbers of pests intercepted, while figures for other ports refer to numbers of lots of infested and infected material, each lot often containing several pests.⁵ Includes interceptions at Gulfport, Miss.⁶ Includes interceptions made at Beaumont and Sabine, Tex., and Lake Charles, La.

NOTE.—Inspectors stationed at Puerto Rico made 27 interceptions of insects and 5 interceptions of plant diseases during their field and packing-house inspection of fruits and vegetables for shipment to the mainland.

CERTIFICATION FOR EXPORT

The demand for inspection and certification of fruits and vegetables and nursery stock for shipment to foreign countries increased to a marked degree during the fiscal year 1933. Five thousand seven hundred and sixty-six shipments, representing 2,464,321 containers, were inspected and certified. This represents an in-

crease over last year of approximately 71 percent in the number of shipments certified and approximately 210 percent in the number of individual containers.

The more important commodities inspected and certified were: Apples, 2,242 shipments, consisting of 1,225,428 boxes, 90,110 barrels, and 39,543 baskets; pears, 1,065 shipments, consisting of 663,592 boxes, 37,644 baskets, and 527 barrels; potatoes, 791 shipments, consisting of 159,058 bags, 8,402 barrels, and 43 crates and baskets; miscellaneous fruits and vegetables, 899 shipments, consisting of 96,406 packages; and nursery stock, including seeds, 292 shipments, consisting of 846 lots.

Through the cooperation of the Bureau of Agricultural Economics, most of the apples and pears were inspected at shipping point by Federal-State inspectors, and certified at the port of export on the basis of such inspection.

A charge of \$1 was made for each certificate issued, and all fees collected were covered into the Treasury as miscellaneous receipts.

QUARANTINE CHANGES

Various changes made during the year affecting foreign plant quarantines, among which the fruit and vegetable quarantine of Puerto Rico is included for practical enforcement reasons, are here summarized.

The avocado fruit order of February 27, 1914, together with its regulations, was revoked, effective July 1, 1932, thus allowing avocado fruits to come under the fruit and vegetable Quarantine No. 56, and avocado nursery stock to fall under the provisions of the nursery stock, plant, and seed Quarantine No. 37.

Quarantine No. 19, on account of citrus canker and other citrus diseases, was modified, effective July 1, 1932, to release citrus seeds from a prohibited status and thus permit their entry under the regulations of Quarantine No. 37.

Regulation 3 of Quarantine No. 37, the nursery stock, plant, and seed quarantine, was revised, effective July 1, 1932, to permit entry of all species of *Fritillaria*; to permit the entry of mango seeds from North America, Central America, South America, and the West Indies; to allow entry for propagation purposes of certain plant materials admitted for consumption under Quarantine No. 56; to provide for the entry of oriental fruit cuttings, scions, and buds, released from a prohibited status by the revocation of Quarantine No. 44; and to provide likewise for citrus seeds excepted from Quarantine No. 19.

Regulation 7 of this quarantine was also revised, effective July 1, 1932, to waive the requirement of freedom from sand, soil, and earth in connection with Canadian-grown plants.

A considerable liberalization of the restrictions on the entry of corn and related plants was brought about in a revision, effective March 1, 1933, of the regulations of Quarantine No. 41, governing the importation of Indian corn or maize, broomcorn, and seeds of related plants.

By the revocation of Quarantine No. 44, effective July 1, 1932, provision was made that stocks, cuttings, scions, and buds of fruits from the Orient should hereafter be enterable under Quarantine No. 37.

The seed- or paddy-rice Quarantine No. 55, was revised, effective July 1, 1933, to include rice straw and rice hulls.

By amendment no. 5 to regulation 2 of the fruit and vegetable Quarantine No. 56, effective July 15, 1932, it was made possible to relax restrictions in reference to a particular portion or area of a foreign country when it is considered that importation from that portion can be safely permitted.

Amendment no. 1 to the regulations of Quarantine No. 58, the fruit and vegetable quarantine of Puerto Rico, effective January 1, 1933, affected regulation 3 only, and provided for the admission to the rest of this country of a considerable number of fruits and vegetables additional to the limited number listed in the original regulation.

A new quarantine, no. 69, on packing materials, came into effect on July 1, 1933. This quarantine prohibits the entry as packing of certain plant materials, of which rice straw is the most important, and brings under a moderate type of restriction several other materials, among which cereal straw other than rice, and grasses and hay, are the most commonly used for packing purposes.

Amendment no. 1 to this quarantine, effective July 1, 1933, permits exceptions to be made in the case of prohibited materials when these have been so prepared, manufactured, or processed that their entry is judged to involve no pest risk.

TECHNOLOGICAL DIVISION

The work of the Technological Division during the fiscal year 1933 was carried on cooperatively with other divisions and projects of the Bureau on problems relating to the sterilization of plants and plant products.

A new form of cottonseed sterilizer for destroying pink-bollworm larvae in cottonseed and adapted to continuous operation in handling the seed as it comes through the gin was designed, built, and tested. The machine is so constructed that it can be heated by steam or, if a boiler is not available, a vaporizing burner of the type in common use for commercial operation can be used as a source of heat. In the tests the sterilizer was found to be efficient and economical and readily heated the seed to a temperature of 145° F., the temperature required for sterilization.

A method of installing thermograph bulbs in cottonseed sterilizers was developed which allows a more accurate determination of the temperature of the seed and also increases the efficiency of the machine. A special stream-lined bracket for holding the bulb was designed and installed in the conveyor in such a way that the bulb is buried in a mass of seed whenever the sterilizer is in operation. This mass of seed prevents the escape of steam from the conveyor and results in more efficient operation. The cost of sterilization is reduced, as much less steam is used to perform the operation.

In cooperation with one of the large cotton companies, a method of treating cotton lint was developed which consists in passing the lint through heavy steel rollers as it comes from the gins and before it reaches the press box. Careful tests showed that such treatment is effective in crushing all seeds which may be in the lint so that any pink bollworms present will be destroyed. The equipment costs approximately \$250 installed, and the operating costs are about 1 cent per bale, as compared with a cost of \$1 to \$2 per bale for fumigation.

A method for treating hardy perennial plants in pots was worked out in cooperation with one of the large nurseries. The concentration of lead arsenate sufficient to kill the larvae of the Japanese beetle, but low enough so that the plants would not be injured, was determined. A treatment was developed which is effective in destroying the larvae and which can be applied to most perennials without injury. In the tests with plants, only 6 varieties out of 61 showed injury. Several thousand individual plants were included in these tests.

Analyses of the soil for lead arsenate in plots of growing plants, heeling-in areas, and plunging frames were made to determine the amount necessary to add to bring these areas up to the 1,500 pounds in the first 3 acre-inches. This lead arsenate content is necessary to insure that no live Japanese beetle larvae are present, so that the plants may be shipped outside the regulated area without danger of spreading the infestation. In all, 872 samples from 392 plots of growing plants, 317 plunging frames, and 34 heeling-in areas were analyzed. These comprised a total of 5,726,153 square feet, of which 3,358,271 square feet needed the addition of some lead arsenate to bring the content up to 1,500 pounds in the first 3 acre-inches. Analyses were made of plots in 22 different nurseries, of which 1 was in Delaware, 16 in New Jersey, and 5 in Pennsylvania.

A treating tank for applying the hot-water treatment to bulbs, as required by both domestic and foreign plant quarantines, was designed, built, and tested, and proved to be more efficient than many of the tanks now in commercial use. Plans have been prepared for the construction of this equipment, and they will be furnished to bulb shippers when desired.

A number of alterations and additions have been made to the car-fumigating houses along the Mexican border. Vacuum-fumigating equipment has been installed at four ports to treat small shipments of infested or suspected material; new doors have been built; a new roof was applied to the fumigation house at Nogales, Ariz., and numerous minor repairs have been made.

Considerable service work and work of an advisory nature has been done with the other projects in the Bureau.

TERMINAL INSPECTION OF MAIL SHIPMENTS OF PLANTS AND PLANT PRODUCTS

During the fiscal year, the list of terminal inspection points in California for the inspection of plants and plant products, under the authority of the act of March 4, 1915, was revised, as were also the lists of plants and plant products subject to such inspection in Florida and Georgia. The details of these revisions are given in the Service and Regulatory Announcements of this Bureau.

Louisiana and Puerto Rico inaugurated terminal inspection during the year, while three States, Idaho, Wyoming, and Georgia, found it necessary, on account of lack of funds, to discontinue such inspection.

Terminal inspection is now maintained by the following: California, Arizona, Montana, Florida, Washington, Arkansas, the District of Columbia, Mississippi, the Territory of Hawaii, Utah, Oregon, Oklahoma, Louisiana, and the Territory of Puerto Rico.

CONVICTIONS AND PENALTIES IMPOSED FOR VIOLATIONS OF THE PLANT QUARANTINE ACT

The following convictions and penalties imposed for violations of the Plant Quarantine Act were reported to the Bureau during the year:

Avocado order: Two convictions, with 1 fine of \$25 and 1 jail sentence of 5 months.

European corn-borer quarantine (domestic): One conviction, with fine of \$50.

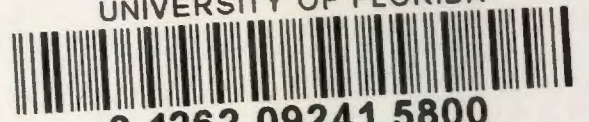
Japanese-beetle quarantine: Four convictions, with fines aggregating \$105, and, in one instance, defendant was placed on probation for 6 months.

Quarantines affecting Mexican plant products: Fines aggregating \$156.85 were imposed by customs officials on the Mexican border against 37 persons caught attempting to smuggle in from Mexico prohibited plants and plant products.

Quarantines affecting Canadian plant products: Fines aggregating \$38.90 were imposed by customs officials on the Canadian border against eight persons caught attempting to smuggle in from Canada prohibited plants and plant products.



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