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NEWS LETTER

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PLANT QUARANTINE AND CONTROL ADMINISTRATION

UNITED STATES DEPARTMENT OF AGRICULTURE

Number 17

(NOT FOR PUBLICATION)

May 1, 1932.

TECHNOLOGICAL

The work of analyzing the soil of nursery plots that have been treated with lead arsenate to determine the arsenic content of the upper 3 inches of soil is proceeding rapidly at the White Horse laboratory. V.A. Johnson has charge of sampling the plots and he reports that all but two or three samples from plots containing growing plants have been collected and delivered at the laboratory. The general method of sampling this year is to take 80 borings, 2 inches in diameter and 3 inches deep, from each plot of 20,000 square feet or under. The cores are placed in 50-pound lard cans, numbered serially, and conveyed to the laboratory where they are prepared for analysis and analyzed.

A new soil sampler was developed for this work. This consists of a tube of mild steel, 3 feet 2 inches long, and 2 inches inside diameter, ground to a cutting edge at one end so that a sample could be taken exactly 2 inches in diameter. The tube was equipped with a guard or flange which allowed it to be thrust into the soil exactly 3 inches. An appropriate handle was attached to the upper part of the tube and the soil was ejected from the sampler by means of a brass plunger operated by a rod extending out of the top of the tube. This apparatus is similar in design to certain well known types of soil samplers, with some modifications to fit it to this particular type of work. As mentioned, the borings were placed in cans and these numbered cans were taken to the laboratory for analysis.

In preparing the samples for analysis, it is frequently necessary to dry the soil. This is accomplished in a drier designed especially for this purpose. The drier consists of a galvanized iron box approximately 28½ by 46 by 72 inches high, constructed of 22-gauge sheet steel on an angle iron frame, one side being hinged and equipped with appropriate fasteners, forming the door. The soil is placed in the box in sheet iron trays 24 by 36 by 2 inches deep. The drier accommodates 20 trays. These are staggered or placed in such a position that the heated air circulates from one end of the box to the other, back and forth over the trays. Heat is furnished by means of two large industrial gas burners under the box and the air, after passing over

the trays, is exhausted through a stack at the top. The equipment will dry approximately 40 samples of soil in eight hours.

A soil sifter was also developed by modifying an ordinary grain cleaner and installing special sieves. This is cheap and convenient to operate and does the work required very well. It is operated by hand.

A special mixing table for mixing and quartering the soil was built with holes at diagonal corners for the elimination of the discarded quarters.

The work, after the samples reach the laboratory, has been handled by G. A. Russell and assistants. Two junior chemists, Messrs. Roy Glick and Hyman Cohen, have been appointed for a period of three months, and other help is furnished by the Japanese Beetle project.

FOREIGN PLANT QUARANTINES

RECENT ENTOMOLOGICAL INTERCEPTIONS OF INTEREST

Mediterranean fruit fly from Bermuda.--Living larvae of the Mediterranean fruit fly (Ceratitis capitata Wied.) were intercepted at Boston in papaya (Carica papaya) and loquat (Eriobotrya japonica) in the mail from Bermuda. These represent our first interception record of this fruit fly in papaya from Bermuda and our second interception record of this fruit fly in loquat from Bermuda.

Bruchid from Trinidad.--Phelomerus aberrans Sharp (Bruchidae) was intercepted at Washington, D. C., in Cassia javanica seed in the mail from Trinidad. This bruchid is recorded in Cassia spp. seed from Central and South America.

Thrips from Morocco.--Thrips angusticeps Uzel was intercepted at Boston on lettuce in stores from Morocco. J. R. Watson, of Gainesville, Fla., reports that this is a European species not known to occur in this country.

Olethreutid in okra pod.--A living larva of Crociosema plebeiana Zeller (Olethreutidae) was intercepted at Brownsville, Tex., in an okra pod in cargo from Mexico. This olethreutid has also arrived from the Azores and Uganda.

Scolytid from the Dominican Republic.--Living adults of Coccotrypes thrinacis Hopk. (Scolytidae) were intercepted at Washington, D. C., in Sabal adansonii seed in the mail from the Dominican Republic.

New to the National Museum.--An adult of Mycotrechus geminatus Gorh.

(Erotylidae) was intercepted at San Francisco on banana in cargo from Panama. W. S. Fisher, of the Bureau of Entomology, reports that this species is new to the National Museum collection.

Thrips from England.--Chirothrips similis Bagnall was intercepted at Washington, D. C., among Scabiosa plant material in the mail from England. This thrips is recorded from California on grasses, wild lupin, Monardella villosa, and the terminal leaf clusters of plum trees.

Endomychid from Central America.--Phalantha intricata Gorb. (Endomychidae) was intercepted at Charleston, S. C., on banana in cargo from Honduras, and at San Francisco on banana in cargo from Costa Rica.

Lygaeid from Morocco.--Metopoplax ditomoides Costa (Lygaeidae) was intercepted at Washington, D. C., with almond plants in the express from Morocco.

Thrips on heather.--Taeniothrips ericae (Halliday) was intercepted at Honolulu, Hawaii, on dried heather sprigs in the mail from England and Scotland. J. R. Watson, of Gainesville, Fla., reports as follows: "This is a common thrips on this plant throughout northern Europe, not known to occur in any other part of the world. There were not only adults on these but numerous larvae."

Camphor scale from Japan.--The camphor scale (Pseudaonidia duplex Ckll.) was intercepted at Seattle, Wash., on orange in cargo from Japan and on Mandarin orange in baggage from Japan. This coccid, which was first discovered in the United States at New Orleans in August, 1920, has also arrived from China, the Netherlands, and the Philippines.

Varietal name to be omitted.--In connection with the identification of the larvae of Laspeyresia splendana Hbn. (Olethreutidae), which were intercepted alive at Philadelphia in raw chestnuts in the mail from Italy, C. Heinrich, of the Bureau of Entomology, remarks as follows: "I shall hereafter omit the varietal name reaumurana Hein."

Bean pod borer in pigeon pea.--A larva of the bean pod borer (Maruca testulalis Geyer) was found in a pigeon pea (Cajanus indicus) pod in Porto Rico. Our records show that this insect was collected in the same host in Porto Rico in 1928.

Syrphid in dahlia tuber.--Five living larvae of Eumerus sp. (Syrphidae) were intercepted at Philadelphia in a dahlia tuber in the mail from Germany.

RECENT PATHOLOGICAL INTERCEPTIONS OF INTEREST

Immature rust spores confused.--Several interceptions recently have been determined as II Puccinia sp? It has been necessary to question the

determination because the urediniospores of *Puccinia* and *Uromyces* look alike, although the genera are readily separated in the telial stage because the teliospores of *Puccinia* are two-celled while those of the *Uromyces* are one-celled. However, it often happens that the first teliospores of a *Puccinia* are one-celled, hence it is desirable to have mature sori of the telial stage in cases where rusts of both genera are common on the host in the country of origin of an interception. When the rust is just starting, as was the case with the interception material mentioned, it is not practicable by holding the material to obtain identifiable telia.

Vaccinium cultures sterile.--Several lots of berries of *Vaccinium* spp. were received in response to the request of the Bureau of Plant Industry (see p. 2 of the March News Letter). All attempts to get cultures from these commercial lots of berries have failed. It is possible that some preservative was added to the berries or the organisms may have died in the absence of sufficient oxygen.

Gladosporium carpophilum, the peach scab pathogen, was found sporulating freely on small twigs of *Prunus* sp. from Poland intercepted in mail at Philadelphia. The only previous interception recorded in the files was on apricot from Chili in 1925.

The fruiting bodies of Schizophyllum commune were found on a shipment of Australian logs at Norfolk. Although rather common and widespread on dead, woody parts of trees and shrubs, this is the first interception of the fungus since 1919.

Nematodes in some diseased narcissus bulbs from Porto Rico intercepted at Philadelphia were determined as Pathoaphelenchus parietinus and Aphelenchus avenae. P. parietinus (formerly known as Aphelenchus parietinus) has been intercepted on narcissus once from Holland and once from Cyprus; but this is the first interception of A. avenae on narcissus.

A disease of watermelon sent in from Porto Rico proved to be due to Diplodia sp. This disease occurs in the Southern States but for some reason has no accepted specific name. It is interesting to note that the only disease recorded on watermelon in our interception files came from Egypt. Why have we had none from near-by parts of the world?

Ascochyta caricae in papaya.--A large diseased spot from a papaya fruit collected in Porto Rico proved to be covered with pustules of Ascochyta caricae. This fungus was known from the type material only which was collected in Ecuador on petioles of papaya. This specimen was, of course, a welcome addition to the mycological herbarium of the Department. The appearance of the lesion indicates that the disease might be an important one if conditions favorable to its development should exist in localities where it occurs.

Nematode in bulbous Iris.--Among the nematodes found in bulbous Iris during the current season's field inspection of special permit material is

Pathoaphelenchus winchesi. The only previous finding of this organism was in faeces of a pig in England. While belonging to a parasitic group nothing is known as to its possible importance.

Sphaeronema sp. was found in the basal plate of a diseased onion from Holland intercepted at Philadelphia. As compared to the species causing black rot of sweetpotatoes the beaks of the pycnidia were much shorter and broader, and were hyaline instead of brown. There was only a small amount of the material, and pycnidia were difficult to find; hence it was not practicable to get anyone to study the organism.

SEASONAL VARIATION IN DISEASE INTERCEPTIONS

Seasonal fluctuations in the number of interceptions of some plant disease organisms are quite marked. In part this is due to the seasonal fluctuations in importations of the host and in part to the seasonal nature of the diseases. Disease interceptions of Lima beans show Elsinoe canavaliae predominating throughout the season, but Diaporthe phaseolorum seems to appear with increasing frequency as the season advances.

For several weeks relatively little material infected with Botrytis sp. was intercepted but beginning March 9, a number of Botrytis sp. interceptions were received in relatively rapid succession. Hosts for Botrytis sp. interceptions for March include onion from Egypt, England, Germany (3), and Italy, cabbage from England, green peppers from Mexico, and carrot and orange from Spain. The material was sent in from Charleston, Mobile, Nogales, Norfolk, and Philadelphia (6). An inspection of the records already in the files indicated that Botrytis is most likely to be intercepted in April, the number for each month being as follows: January, 13; February, 9; March, 18; April, 25; May, 8; June, 8; July, 4; August, 2; September, 7; October, 9; November, 8; December, 6. Interceptions of Botrytis on material other than onions, largely on miscellaneous nursery stock and bulbs, are as follows: January, 35; February, 26; March, 31; April, 36; May, 19; June, 2; July, 4; August, 6; September, 44; October, 39; November, 41; December, 55.

There appeared, on a casual examination of the slips, to be a tendency for Botrytis to be intercepted more often during certain periods on specific hosts regardless of the origin of the host material, even though from both north and south of the equator. While we do not have enough data as yet to work out anything definite along this line even in a tentative way, it may be possible to gradually build up a set of data that will be of assistance to the inspectors by enabling them to know what special types of infections to look for at different seasons, and of assistance to those making the determinations by enabling them to know the probable causal agent where symptoms are present but the organism is immature.

If any of the port inspectors have analyzed their records or have any special notes that would be of assistance in such a study, the Washington office would appreciate a summary of the information available.

FORMS BROUGHT UP TO DATE

On September 19, 1931, E. R. Sasscer appointed a committee to review all forms used in the Division of Foreign Plant Quarantines, with the object of reducing the number of these forms and of revising those that were not serving their purpose to the best advantage.

After giving careful consideration to all of the existing forms, it was determined that some 60 required prompt attention and the committee has been meeting once or twice a week to work on these forms. This work has been completed for the time being (April 1), and as a result of the committee's recommendations a few forms have been discarded as of no further value, several have been combined--in one case as many as 14 being combined into 1--and a great many have been revised, some of them materially.

In combining and revising the forms, the committee adopted many constructive suggestions submitted by inspectors in charge at various field stations where the forms are used in considerable numbers, and it is believed that the forms, as finally approved, will save considerable time for the employees of the Washington and field offices, as well as for the importers and brokers. It is also believed that the forms will serve their original purpose to greater advantage.

Orders have been placed for all of the revised and combined forms and stocks should be available by July 1. Other forms which require minor changes will be considered as replacements become necessary. A circular letter, listing the forms which have been changed and explaining new procedures to be followed in using some of them, will be sent to inspectors in charge at the appropriate time.

DOMESTIC PLANT QUARANTINES

TRANSIT INSPECTION

Recent interceptions of foreign plant material reported by O. J. Yoder, who examines both foreign and domestic shipments at St. Louis for compliance with Federal quarantines, included 10 gooseberry plants which arrived from Germany in violation of the white-pine blister-rust quarantine. The gooseberries and other unpermitted plant material were destroyed. The entry of these host plants from Europe, Asia, the Dominion of Canada, and Newfoundland is prohibited. The white-pine blister-rust quarantine as originally issued on September 16, 1912, was the first to be promulgated after the passage of the Plant Quarantine Act of August 20, 1912. The embargo first applied to five-leaved pines only but was later extended to include currant and gooseberry plants.

Two crated pieces of granite apparently originating from Finland and forwarded from Boston to St. Paul without the Federal permit required under the gipsy moth and brown-tail moth quarantine, were recently seen by Geo. W. Nelson, transit inspector at St. Paul. They were inspected and allowed to proceed to destination.

Inspector J. M. Moran was held up and robbed at Chicago some time ago, the thief taking his official badge, as well as his pocketbook. The holdup man was captured the next day, and the badge returned. Prosecution resulted in the imposition of a stiff sentence to the Illinois penitentiary for stealing the purse, and it is reported that further prosecution in Federal courts for taking the badge is in prospect. Not long after this holdup, a Federal car in use by the transit inspectors was stolen from a point where it was parked near a postal station in Chicago. It was also recovered a few days later after being severely damaged.

Under a recent amendment to the Mexican fruit worm quarantine regulations, sterilization is made a requirement for shipping citrus fruit produced in the lower Rio Grande Valley of Texas and consigned to Southern and Western States. Certain fruit shipped to northern destinations was also sterilized, the work being done at Chicago and St. Louis under the supervision of transit inspectors located at those points. The process involves holding the fruit at 30° to 31° F. for a period of 15 days. Thirty-two cars of fruit were sent north for sterilization at the two cities named between the time the amendment was issued on March 5 and the close of the shipping season on March 25. The fruit is reported to have gone from the cold storage after sterilization in excellent condition, and sold at prices as high as any on the market.

Inspection of nursery stock in transit through Milwaukee, Wis., has recently been instituted by the State Entomologist's office for the enforcing of State and Federal regulations. J. M. Corliss, of the Chicago office of the Administration, assisted in setting up the system of working out the tours.

PHONY PEACH DISEASE

The activities of the inspectors at southern points in examining nursery stock shipments during the winter and spring to insure compliance with phony peach disease quarantine regulations, resulted in finding 51 apparent infringements up to April 6. The greater number of these was seen at Atlanta and Memphis. All were found in express except four. This work has been carried on under cooperative arrangements with the States of Georgia, North Carolina, Tennessee, and others. The Federal and State Departments have maintained, it is believed, an effective check on the movement of restricted plant material. The intercepted shipments were consigned to various points in Alabama, Arkansas, Florida, Georgia, Illinois, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, New York, Pennsylvania, South Carolina, Tennessee, Texas, and Virginia. Checking on such shipments was largely discontinued on April 30, with the close of the shipping season, and nursery

inspection will be started shortly. G. W. R. Davidson, in charge of this project, is now working out methods of cooperation with the various States concerned under which State men will assist in inspecting the environs of peach-growing nurseries this coming summer.

NARCISSUS BULB PESTS

Narcissus growers were well represented at the hearing held in Washington on March 28 to consider the possible withdrawal of the Department of Agriculture from the inspecting and certifying of narcissus bulbs for interstate movement. The growers, with one or two exceptions, requested that the Department continue in the field. The State inspectors were divided on the question

At a meeting of the Northwestern Florists' Association on April 12, at Tacoma, Wash., the members unanimously voted their support of an increasingly stringent program of narcissus inspection and pest suppression presented by the Washington State Department of Agriculture.

WHITE-PINE BLISTER RUST

At the hearing held on March 26 to consider the revision of the white-pine blister-rust regulations, or the revocation of the quarantine, the Bureau of Plant Industry of this Department made the following recommendations:

"The Bureau of Plant Industry recommends that the Federal quarantine be retained in a simple and flexible form. A simplified Federal quarantine which would be helpful to the aims of the cooperative blister rust control programs should accomplish the following things:

"1. Under Federal permit, allow interstate shipment of five-leaved pines only when the stock is grown from seed under standard rust-protection conditions, EXCEPT that permits shall be granted for the movement of unprotected stock into those States where the State forestry and plant quarantine officials have notified the Federal Plant Quarantine and Control Administration that it is the State's policy to admit unprotected white pine stock without any discrimination between the States of origin of such stock. That is, if any State is on record with the United States Department of Agriculture as being willing to admit unprotected stock from any and all States, a Federal permit would be issued automatically. Otherwise, the Federal permit would be issued only for stock grown under standard protection requirements. There would be no distinction between infected and uninfected States but only between protected and unprotected stock. The Mississippi Valley line would be abolished under this plan.

"2. Permit unrestricted interstate movement of all *Ribes*, other than *R. nigrum*, *R. petiolare*, and *R. bracteosum*, except that *Ribes* shipments into States having established blister rust control areas

must be accompanied by a Federal permit, as provided in the present quarantine. The present dormancy and defoliation requirements on Ribes shipped out of infected States to be omitted from the quarantine, but the dipping requirement continued. Restrictions on the movement of R. nigrum to be continued as in the present quarantine, and the same restrictions laid against R. petiolare and R. bracteosum (two species of wild Ribes that are highly susceptible to rust infection)."

These recommendations are being studied in the Administration to determine the possibility of the practicable and economical enforcement of the provisions quoted or of some modification of them.

DATE SCALE

During the month of March, no Parlatoria scale was found in the Coahuila Valley. In the past year, April 1, 1931, to March 31, 1932, only three infested palms have been found in this area. The number of infested palms has decreased each year as follows: 1928 - 1,612; 1929 - 558; 1930 - 186; 1931 - 17; and 1932 to date - 0.

When the first survey was made the date plantings were located on a map of the Valley and the severe infestations considered centers of spread were marked. An area including all plantings within 2 miles of these centers of spread was designated as the infested area. From the evidence at hand 2 miles seemed to be the limit of natural spread. Careful and continued inspection in the infested area located many infestations evidently resulting from the spread. The natural means of spread seems to be wind, birds, and large insects. While no direct evidence of such spread has been gathered, there is considerable circumstantial evidence, such as colonies of scale found around cicada egg punctures and birds' nests when no scale could be found on other parts of the palm. Study of the map would indicate that the spread was in the general direction of the prevailing winds.

In the area outside the infested area it would seem that the scale could be carried only on offshoots from infested gardens, by men going from infested gardens to clean gardens, or, possibly, by pollen from infested gardens used in clean gardens. There are many instances of the scale being carried on offshoots, but there is little evidence of its being carried on a man's clothing and none on pollen, although some cases of the latter are still under observation. Information on the source of offshoots and pollen has been gathered and most of the plantings outside the infested area may now be dropped from the inspection lists.

In the infested area the problem now is to decide how long inspection

should be continued in the noninfested gardens after the severe infestations have been reduced to a point where there is no danger of spread, and in infested gardens after the last scale is found.

Inspection is not perfect and light infestations are often overlooked. The best inspectors will have their attention diverted at times especially when scale is seldom found. No inspector will observe 100 per cent of the surface of the palm nor will any two (because of height, position on the ladder, etc.) inspect from exactly the same angle. However, the infestations will increase in intensity and repeated inspections by different inspectors should locate them.

A definite time limit could be set if all the palms were uniform, but the size, number of offshoots, amount of foliage and location (especially of ornamentals) in regard to other palms, trees, brush, and buildings influence the ease or difficulty of inspection.

The above refers to infestations on the exposed portions of the palms. There is also to be considered the possibility of infested leaf-bases below the fiber on palms that were previously infested and defoliated and torched. It is possible that scale might breed under these conditions and not reach the foliage until offshoots come out near the infested leaf-bases. Tree records have been kept in all infested gardens and such infestations can in all probability be found by special leaf-base and offshoot inspection.

The logical procedure would be, it would seem, to consider each planting as a separate unit and continue inspection until that garden was considered free of scale. This would result in a gradual reduction in the area until the project was considered completed.

EUROPEAN CORN BORER AND JAPANESE BEETLE

Specialized Corn Borer Activities

The control work on the isolated infestations in southern Indiana and northern Kentucky is progressing in a very satisfactory manner. Farmers are cooperating in every way possible by arranging their field work so as not to interfere with the progress of the work or work which has already been completed. A great deal of interest is manifested by farmers from a wide area, many of whom have called to inspect the work and get first-hand information as to the amount of extra labor required in practicing control methods, at which time they discover that it does not involve any great expenditure of labor or money in addition to their ordinary field operations.

The work to be done on the isolated infestations in Wisconsin will be of a different nature. The weather conditions have not permitted any field

work the past month. The farmers in that locality cut the corn in the fall and later plow under the stubble. In the spring they use the spring-tooth harrow to prepare the ground for seeding. The spring-tooth harrow is a very unsatisfactory implement from a control standpoint because it brings to the surface much of the corn plant debris that has been turned under, which necessitates considerable pick-up work on the fields. This fact will be quite forcibly impressed upon the mind of the individual farmer who can naturally see that a different method of cultivation would save considerable labor and time.

The first of the month it was discovered that there were a few minor violations in moving fodder and corn into unregulated territory, after which uniformed inspectors were sent to the field to stop the practice. After their presence was discovered all violations ceased and finally the inspectors were temporarily removed. This demonstration proves beyond a doubt what might happen when the public discovered that there was no effort being made to check such practices. The very presence of the men keeps before the public the thought of the necessity of the prevention of the spread of the corn borer in an unnatural way, which is only true of all of the activities carried on in the administration of this work.

Arrangements are being made by the State of Connecticut for the annual spring check-up of the disposal of corn debris. According to the order issued by the Director of the Agricultural Experiment Station, all corn debris should be plowed under, burned, or otherwise destroyed by April 10. For the first time, this work will include the whole State of Connecticut.

Exclusive or Combination Japanese Beetle Work

Erection of a fumigation house in which may be fumigated all blueberries shipped from the vicinity of New Lisbon, Burlington County, N. J., by members of the Blueberry Growers' Association is under consideration. The fumigation house contemplated is one of pressed brick construction, 15 by 20 feet, the interior to be rendered gas proof with 3-ply tar roofing material or a thick coating of tar or asphaltum. A flat, tar slag roof is proposed. Equipment is provided in the suggested plans for heating the building to the required treating temperature and for volatilizing the carbon disulphide fumigant. Such a building would have a capacity of 300 crates. During the height of the berry shipping season it would probably be used two or three times a day. The Association proposes to fumigate all berries shipped, regardless of their destination. This procedure is motivated by the fact that beetles feeding within the cellophane packages have in the past affected the salability of the berries. Berries intended for shipment under certification from the Japanese beetle regulated territory would be fumigated under supervision in the morning. Further fumigations during the day would be performed wholly for the convenience of the shippers and would not require presence of an inspector. The Association is also contemplating a change of packing for their product. Previously all berries have been shipped in regular quart berry boxes covered with cellophane. The pack under consideration consists of a cardboard box having a certain number of holes in each side, and finally covered with either cellophane

or some other transparent material. Tests of the proposed package will be required to determine gas penetration. Not until last year did beetle infestation in the blueberry-growing section of New Jersey reach such proportions as to render impracticable inspection of berries in the grading and packing shed. During the latter part of the 1931 shipping season, 989 crates of blueberries were fumigated for members of the Association in the fumigation house owned by the market commission of the borough of Hammonton, N. J. Prior experiments had shown that carbon disulphide fumigation does not affect the taste or "bloom" of the berries.

The regulated area as extended in the tenth revision of the rules and regulations effective January 1, 1932, comprises 51,339 square miles. This is an increase of 3,776 square miles over the territory under regulation last year. Reductions in regulated sections were made in Massachusetts, Maryland, and Virginia. Release from the quarantine regulations of a portion of Hampden County, Mass., reduced the Japanese beetle zone in that State from 1,618 square miles to 1,207 square miles. Previously regulated uninfested area in Maryland this year dropped from the restrictions reduced the zones therein from 6,934 square miles to 2,439 square miles. An uninfested portion of last year's Virginia regulated section in Fairfax County was also released from quarantine operation, resulting in regulated environs this year of 1,099 square miles compared to 1,224 square miles in the 1931 zone. The only increases in territory were in Delaware, Pennsylvania, and New York. With inclusion of the entire State of Delaware, 90 square miles were added to the zone. Nominal area increase in Pennsylvania of from 17,894 square miles to 19,871 square miles was necessary to include newly discovered infestations in the central part of the State. The only notable extension of area was made in New York. Northern extension of the regulated territory in the latter State was made to include minor infestations at Albany and Fort Edward and incidentally to afford unrestricted movement of the usually high-grade and consequently uninfested farm products from New York City to the numerous summer resorts in the Catskill Mountains. This extension increased the New York zone of quarantine operations from 4,366 square miles to 11,307 square miles. Zones in the States of Rhode Island, Connecticut, and New Jersey, and the District of Columbia remained unchanged since they were already included in their entirety. Omitting consideration of the New York area, there was a reduction in remaining territory of 2,974 square miles.

Effectiveness of lead arsenate control measures is indicated by reduced or retarded beetle populations at seven isolated infestations subjected to poison applications for three consecutive years, and at four isolated infestations which received arsenate treatments during 1930 and 1931. Infestations so treated are of three and four years' standing. Of the localities which received three consecutive treatments, beetle recoveries in Springfield, Mass., and Cape Charles, Va., show marked reductions over peak infestations, while slight increases but evident checking of normal expected increase were evidenced at Hartford and New London, Conn., Binghamton, N. Y., Sayre, Pa., and Norfolk, Va. Among the localities receiving two arsenical applications, Kingston, N. Y., and Willimantic, Conn., showed fewer beetles recovered in known infested sections, while a heavy mortality with only a minor increase

in specimen collections was observed in Boston, Mass. The principal obstacle to effecting complete control through lead arsenate application is the difficulty of determining the exact range of soil infestation. Females collected at one location have frequently oviposited in a section removed from the point of collection. Treatment of locations scouted or trapped with positive results consequently does not always reach the entire larval population of an infested community.

By four weeks' operation with two shifts per day, painting of the project's supply of 34,666 beetle traps was completed on March 19. Painting of 33,000 trap rods was also accomplished at the South Norwalk headquarters. The remainder of the rods are being painted at Norfolk, Va. Begun on a small scale late in December the work at South Norwalk was fully organized about a month later. There were expended 8,519 man-hours in jar grinding, trap and rod repair, cleaning and inspection, trap painting, rod dipping, and packing of trap assemblies and rods. The entire supply of both traps and rods was hauled to separate storage space from which they may readily be loaded for removal to distant trapping operations. Approximately 600 gallons of lacquer and 250 gallons of lacquer thinner were used in spray painting the trap assemblies. One hundred and fifty gallons underframe black (asphaltum), 50 gallons naphtha, and 85 gallons gasoline were required for rod painting. The cost of all operations incident to bottle grinding, repair, painting, and packing of the completed trap assemblies is estimated at 14.27 cents per trap. The cost of rod repairing, cleaning, and painting averaged 2.66 cents per rod.

The project has acquired a small model of a rotary plow or tiller which will be tested in connection with the application of lead arsenate in heeling-in areas and nursery blocks containing growing plants. Funds for the purchase of the machine were furnished by the State of New Jersey. Of foreign origin and of comparatively recent introduction in this country, the machine is a departure from the standard mode of tillage in that the soil is agitated by means of sharp prongs revolving at a high rate of speed. The machine has a $2\frac{1}{2}$ h. p. gasoline engine, giving a speed of one-half mile per hour. With it a 13-inch strip of soil may be stirred to a depth of from 2 to 8 inches. One gallon of gasoline with an additional 6 per cent of oil will run the tiller for three hours. An attempt will be made to rig on the front of the machine a distributing unit to permit in a single operation uniform distribution of lead arsenate and its thorough incorporation with the upper 3 inches of soil.

Plans have been formulated for the establishment early in April of quarantine line stations at the border of the regulated zone. Six stations will be operated in Pennsylvania, 1 in Maryland, 6 in Virginia, and 3 on the West Virginia-Maryland boundary. With the exception of three posts on the border of the isolated zone comprising Portsmouth and Norfolk, Va., the stations will each be manned by a captain and one road inspector. Two men will alternate posts in covering three exit roads from Portsmouth and Norfolk. A supervisor from the Oakmont, Pa., district headquarters will be in immediate contact with the six Pennsylvania posts. An experienced road patrol supervisor

from the South Norwalk headquarters will superintend the establishment of all posts and later exercise immediate field supervision over road patrol operations in the above-mentioned States. Early establishment of six line stations in New York is also contemplated.

Movement of plant material to and from the Philadelphia Flower Show necessitated considerable unscrambling of stock on the part of Japanese beetle inspectors supervising receipt and removal of exhibit material. This annual exhibition of the Pennsylvania Horticultural Society was held from March 7 to 12, inclusive. As the plants, cut flowers, sod, and peat arrived they were listed by an inspector. Plant material arriving from classified premises was sealed with Department lead seals. Exhibits were examined to assure that adequate safeguards were being taken to prevent mixing of certified with uncertified stock. Throughout the week frequent examinations of foliage and blooms were made for adult beetle emergence. At the conclusion of the show, check was made of stock returning to classified establishments.

Tests are still in progress at the New Jersey district headquarters of mechanical devices for removing adult beetles from string beans. Six differently constructed machines have been tried, one of which offers promise of being practicable and efficient. Although machine tests already made indicate that beetle infestation may successfully be removed from these farm products by mechanical means, the beans used in the tests have been of distant origin and somewhat travel toughened. Cool weather has also aided in their preservation after machine handling. A critical test yet to be made is the quick handling of large quantities of freshly picked beans during hot weather. It remains to be determined whether the slight tumbling of the fresh beans in their trip through the "debeetler" will injure them to the extent of impairing their keeping qualities.

Visits by inspectors were made to 1,754 unclassified establishments in New Jersey for the purpose of acquainting the concerns with their privileges under the quarantine regulations. Forms delivered by the inspectors were executed and returned to district headquarters by 648 firms in the State. To date 24 establishments have availed themselves of the opportunity afforded all nursery and greenhouse establishments within the regulated zone of acquiring a classified status. Throughout the winter inspectors in New Jersey also made 861 calls at classified establishments. This has been a more intensive winter survey than has hitherto been possible. Intimate contact with nurserymen thus made possible has been mutually helpful in promoting a fuller understanding of local nursery conditions and regulations applicable to plant movement within and from the different establishments.

Schedules were in course of preparation during March of Japanese beetle trapping operations to begin in the extreme southern coastal States the latter part of April and fore part of May. Purchases under competitive bids were made during the month of 2,063 pounds geraniol, 230 pounds eugenol U. S. P., 350 gallons black strap molasses, and 7 tons coarse red turkey wheat bran. As soon as is received 750 pounds of glycerine C. P., there will begin mixing of these

ingredients of trap bait. Prior to award of the bid for geraniol, samples submitted were tested for specific gravity, presence of aldehydes, and olfactory properties at the Japanese beetle research laboratory of the Bureau of Entomology. Optical rotation tests of the samples were made with a 10 cc tube polarimeter at the New Jersey Agricultural Experiment Station.

With the approach of spring weather, the nursery and greenhouse industry is becoming more active, but it is evident that the general business depression is having more effect on this business than during the previous two years.

The Hartford Office has been busy preparing for the Flower Show to be held in that city during April--advising the Society of American Florists and Ornamental Horticulturists on the Japanese beetle regulations so that members intending to exhibit at the show may be informed of the requirements to obtain certification of their material to leave Hartford at the termination of the show.

Distribution of approximately 10,000 "Shipper's Guides" to classified nurserymen and other interested shippers and to all post offices within the Japanese beetle regulated sections has been completed. With these "Guides" in their hands, shippers will no longer be in a position to attribute violations to misunderstanding of the quarantine map as a guide in determining whether particular cities and towns are within or outside regulated zones.

MEXICAN FRUIT WORM

Infestations of Anastrepha ludens were found in 35 groves extending from San Benito to Mission during the month of March. This makes a total of 40 premises in which infestations have been found this season to the end of March. The infestations were more general in Hidalgo than in Cameron County. More groves were found infested in the Weslaco, Pharr-San Juan-Alamo, and Mission districts than in the others. In certain sections of several groves, infested fruit could be found with ease, but in the majority of groves infested fruit was found only after intensive inspections. A number of growers and other interested persons were given the opportunity of visiting several of the groves in which infested fruit could be fairly easily found. Here they were given the opportunity of finding infested fruit themselves and of observing the work of the maggots in the fruit. It is expected that the visits of these people will have a very favorable reaction among the rest of the citizens of the Valley, many of whom have never seen a live specimen of the fly in any of its stages.

Following the finding of infestations, the County Committee established

"infested zones" as required by the State law. The fruit in these groves was required to be harvested within a period of five days after notice of the establishment of the zone. The fruit from the noninfested groves within these zones was required to be sterilized if shipped to the Southern or Western States, or to be shipped north and east without sterilization. The fruit from infested groves was required to be sterilized in St. Louis or Chicago and consumed in the Northern and Eastern States. Fruit from the infested trees or infested portions of groves was destroyed by burial. Approximately 4,387 estimated packed boxes, 1,117 field boxes, and 4,706 bushels of fruit from infested groves were so destroyed.

Prior to March 5, fruit produced outside of infested zones was allowed free movement. However, due to the continued finding of infestations it was deemed advisable to close the Southern and Western States on that date to Valley fruit with the exception of that which had been sterilized. Cold storage plants, capable of maintaining sterilizing temperatures, were designated in Dallas, Ft. Worth, Houston, San Antonio, and Harlingen. Fruit was allowed to be moved under bond to these plants from the Valley by truck and by rail. These bonds were in amount of \$100 for a single truck or \$300 for a fleet of trucks or railroad. Fifty-six truckers and the two railroads posted bonds covering the handling of this fruit. Subsequent to March 5 and prior to the closing of the harvesting period on March 25, approximately 182 cars of fruit were placed in sterilization in the Texas plants. These were about evenly divided between grapefruit and oranges.

With the continued finding of infestations it was decided to begin the host-free period on the morning of March 26 rather than on April 11, which date had been set under a revision of the regulations. Growers and packers were accordingly notified of this closing date, and in spite of a weak market had practically all of the marketable fruit out of the Valley within the specified time, even moving a considerable quantity of Duncan grapefruit on the last two days, the host-free period opening on the morning of the 26th with as little or less fruit remaining in the groves than on any previous opening date. This was considered remarkable in view of the large amount of fruit produced this season, the consistent low prices throughout the season, and the straitened financial condition of many of the growers. No willful refusals to clean up groves were encountered. Several abandoned and absentee-owned groves in the Brownsville district were cleaned by the county with convict labor.

The operation of traps in Matamoros resulted in taking seven adult A. ludens in five premises. Immediately upon finding each of these adults the application of poison bait was inaugurated in the four blocks surrounding the infested premise. Forty-seven specimens of A. ludens were taken from mangoes and oranges imported to the market in Matamoros. Upon finding the infestations in mangoes the Mexican inspector, Sr. de la O, notified the merchants that the next importation of mangoes would result in a fine of 50 pesos against the merchant bringing them in.

No larval infestation was found during the month in the fruit produced

locally in Matamoros. At the time of baiting the traps all drop fruit is picked up and carried to the office of the Mexican inspector where it is carefully inspected. During March, 2,381 sour oranges, 5 grapefruit, and 12 sweet limes were so examined with negative results. The negative findings in locally produced fruit in Matamoros throughout the season indicates that the trapping and baiting program carried on there is highly successful.

Following the closing of the Southern and Western States to unsterilized Valley fruit, rumors reached the Harlingen office that fruit was being carried out of the Valley over the ranch roads to the northwest in Starr County. A careful check of these roads revealed that it was possible for trucks to pass on two of them. Accordingly on the 24th inspectors were stationed on these roads to intercept any fruit that might be carried out by these routes. On the night of the 24th two trucks driven by R. S. Cameron and Mike Ferrero, carrying 210 and 90 bushels of fruit, respectively, were intercepted. These trucks were taken to Rio Grande City, where the drivers were charged in the Justice of the Peace Court with violating the State quarantine. Upon pleading guilty they were fined \$10, and costs amounting to \$9. In addition their fruit was confiscated and buried. On the following night three trucks driven by J. C. Brazil, C. C. Close, and M. C. McRory, containing approximately 300 bushels of fruit, were intercepted, and upon pleading guilty the drivers were fined \$10, and costs amounting to \$9, and the fruit was destroyed. The news of these arrests evidently circulated rapidly among the truckers, for though these roads were patrolled several weeks longer no further interceptions were made.

PINK BOLLWORM

The month of March marked the end of the ginning of the 1931 cotton crop in the areas under regulation on account of the pink bollworm and the *Thurberia* weevil, with the possible exception of one gin in the Salt River Valley of Arizona, which is expected to close down early in April. Operations during the month were mostly confined to ginning of bollies and remnants. Practically all oil mills in the regulated area have also finished their season's runs. At the close of the season the gins and oil mills are required to be thoroughly cleaned of all cotton, cottonseed, or other parts of the cotton plant under supervision of the inspectors. This cleaning includes the yards and storage houses as well as the machinery.

The compress and fumigation plants will continue to operate at intervals for some time to come as cotton on hand is shipped out.

One hundred and thirty-one interceptions of material liable to carry the pink bollworm were made at the road stations maintained by the project during March. Of these, 3 were found to contain infested material. On March 3, 31 cottonseed were found on the bed of a truck which came from the

Big Bend, and upon inspection one dead pink bollworm was found. On the same date at the Alpine station about one-fourth pound of cottonseed was taken from a truck proceeding from Presidio and en route to eastern points. Three dead pink bollworms were found in these seed. Thirty-nine cottonseed, one of which contained a dead pink bollworm, were intercepted at the Van Horn station on March 23 in a burlap sack carried in a car from Presidio en route to Arizona. Some of the other interceptions made during the month showed damage in material evidently caused by the pink bollworm.

Scouting during March has been confined to laboratory inspection at San Antonio and El Paso. In the San Antonio laboratory 154 crates of bolls collected last fall were examined with negative results. Each crate contains about 1,000 bolls and the material examined during the month represents samples from the States of Arkansas, Florida, Georgia, Louisiana, South Carolina, Tennessee, and Texas. It is of interest to note that examination of bolls from the Trinity Bay district of Texas and the Cameron Parish district of Louisiana, both of which were formerly infested, was completed during the month with negative results. At El Paso examination of seed collected from gins within the regulated area was continued as in February. Five hundred and twenty-two 1-pound samples were inspected and 112 specimens of the pink bollworm taken. In 10 pounds of seed originating at Hot Springs, in the lower part of Hudspeth County, 84 pink bollworms were found. The results from the examination of seed are checking up very closely with those obtained from inspection of gin trash in regard to the intensity of the infestation at the various points. So far none of the seed on hand at El Paso from outside the regulated area has been examined.

Work on the survey being carried on in Arizona to determine the distribution of the *Thurberia* plant and weevil was continued during March, aided by rather good weather conditions. In the vicinity of Superior some small colonies of uninfested plants not hitherto reported were located. In the other areas no new colonies were found nor were any new infestations found on the formerly reported colonies. This work is being done in the desert and mountains, the men usually following up the water courses or canyons, and it requires sometimes considerable climbing. Two of the inspectors suffered sprained ankles recently and another was lost overnight but without serious consequences. Each inspector carries a case of anti-venom to be used in case of rattlesnake bites. As far as is possible, the lower ranges and desert areas are being worked before the advent of the extremely hot weather.

The troublesome stub cotton problem in the Salt River Valley of Arizona particularly in the two communities found to be infested last year, now seems to be in a fair way of solution. The unusual amount of rain during the winter together with the cold nights experienced to the end of the month, has killed large part of this cotton and retarded the growth of the remainder. Plans are now under way to eliminate what remains, in cooperation with the State of Arizona.

It is still too early to determine how much reduction there will be in

the cotton acreage in the regulated area next season. Planting has already begun in the Salt River Valley and the Big Bend area and will soon start in the other districts. Considerable difficulty is being experienced in securing money to finance the coming crop. In the Elephant Butte irrigation district, which takes in the Mesilla and El Paso Valleys, it is probable that a moratorium on charges for irrigation water will be declared. However, no doubt there will be a considerable reduction in cotton acreage throughout the area.

PREVENTING SPREAD OF MOTHS

S. S. Crossman, who for a number of years prior to last August acted as first assistant on this project, has returned after serving in a similar capacity on the Japanese Beetle and Corn Borer projects during the first part of the present fiscal year. He will be stationed at the headquarters of this project at Greenfield, Mass.

Up to and including March 31, there were 26 high-pressure truck sprayers overhauled, repaired, and painted. This work has been under way continuously since November. It is expected that all of the spraying equipment will be reconditioned before the close of April, and this will allow ample time to thoroughly test and make final adjustments on this equipment before sending it into the field preparatory to starting spraying operations. Spraying usually begins about June 1.

In addition to making mechanical repairs on the high-pressure truck sprayers, a large number of cab tops had to be rebuilt on account of dry rot in the woodwork that in some cases completely destroyed the frames of the roofs and sections of the sheathing. Commercial bodies, which are interchangeable with the spraying unit and tank, were also carefully repaired and painted. These will be ready for the trucking of spraying supplies and equipment to temporary storage points in the field. The supplies are chiefly arsenate of lead, fish oil, and spray hose, and this trucking usually begins early in May and continues intermittently during the spraying season.

The light motor equipment, consisting mainly of $\frac{1}{2}$ -ton delivery type trucks has been carefully overhauled, and although the majority of these trucks are 1928 or 1929 models, most of them have been put in serviceable condition. These trucks are in continuous use throughout the year by scouting crews working in the barrier zone and are operated over some of the roughest mountain roads in New England.

Numerous other essential though smaller jobs of repairing and overhauling are constantly under way. This work consists principally in putting the portable auxiliary pumpers into condition, cleaning and waterproofing oil coats and hats, repairing storage batteries, building tool boxes, and many other

small jobs on accessories for field and shop use.

The portable pumpers referred to are used in conjunction with spraying work to pump water to the sprayer trucks from sources that are inaccessible by the truck spraying machines.

In addition to the above mentioned mechanical work, several large freight shipments were handled and stored. During the month of March, the more bulky lots consisted of 75 tons of arsenate of lead, 100 tons of bituminous coal, $10\frac{1}{2}$ tons of barbed wire, $\frac{3}{4}$ ton of barbed wire staples, 5,000 gallons of fish oil (approximately 100 barrels), paint supplies, floor covering, and motor vehicle repair parts.

For the purpose of making periodic tests to determine whether the safety devices are functioning properly on motor vehicles owned and operated by this activity, a space has been marked off in one of the storage buildings. On the wall side of this building there is a piece of beaver board painted white which is mounted on a white pine frame. This is used for testing headlights. Two feet of the board is marked off with black lines that are spaced 1 inch apart. The first line is 24 inches from the floor, while the last line is 48 inches. There is a white base line drawn on the floor which is 25 feet from the wall. This line is used in placing the cars prior to testing. On each side there is a steel wire frame covered with black sateen. The frames are 14 feet high and 30 feet long. There are adjustable turnbuckles on the ends of the frames so that light may be excluded as desired. This space is used for focusing the headlights properly. There is also a brake meter used in testing the braking equipment of the vehicles. The vehicle to be tested is driven at 20 miles per hour and stopped as quickly as possible. The brake meter registers the performance of the brakes in accordance with the requirements set by the State authorities. Windshield wipers, horns, rear view mirrors, taillights and dashlights are also inspected in addition to the headlights and brakes. Any adjustments as well as replacement parts that are necessary to bring the vehicle up to the proper standard of safety are taken care of. A certificate is issued by the officer under whose direction the testing is done, certifying that the safety equipment on the car was tested and found to be in satisfactory working order. This certificate is carried by the operator of the vehicle at all times and presented to proper authorities if requested.

Intensive scouting work carried on in the northern portion of Bridgewater and in the southern portion of Hillsboro Townships, N. J., is fast drawing to a close. This work started February 12, and from present indications, the scouting work planned will be completed about the middle of April. There have been approximately 2,800 acres of woodland examined in Bridgewater Township and about 2,500 acres in Hillsboro Township, but no gipsy moth infestation has been located. Approximately 200 acres more are to be scouted in Hillsboro, N. J., and when this is done, it is planned to transfer the men from this place to Bridgewater in order to scout approximately 1,500 acres more there. Upon the completion of the scouting work in New Jersey, the men will return to work in the New England section of the barrier zone.

Scouting work was completed in Rupert, Vt., on March 15, 1932. Approximately 10,479 acres of woodland were scouted with negative results. The men working there were transferred to Pawlet, Vt., at which place about 3,000 acres of woodland have been examined to date without locating any gipsy moth infestation. There are two crews also working in Dorset, Vt., where approximately 13,300 acres have been examined with negative results.

Three scouting crews continued examining wooded areas in New Marlboro, Sandisfield, and Sheffield, Mass. Five additional infested sites were located in Massachusetts, which makes a total of 38 infested sites aggregating 301 new gipsy moth egg clusters found and treated with creosote. Twenty-two of these infested sites are located in New Marlboro, 3 in Sandisfield, 12 in Sheffield, and 1 in Tyringham.

Three scouting crews were engaged in an intensive survey of wooded areas in Salisbury, Warren, and Washington, Conn., during March. One additional infested location was found during March in Connecticut, which now makes a total of 8 infested sites consisting of 124 new gipsy moth egg clusters found and treated with creosote up to and including March 31. Three of these infested sites are in Canaan, 2 in Salisbury, and 3 in Warren. It is expected that the scouting work in Washington, Conn., will be completed on or about April 2, and the men working there now will take up scouting work in Warren, Conn.

There were 67 shipments of quarantined products inspected and certified in New Jersey during March, on which no gipsy moth egg clusters were found. This is an increase of over 100 per cent in the number of shipments offered for inspection during February. This increase is, of course, to be expected now that the spring shipping season has begun.

On Long Island there was also the expected increase in the volume of nursery stock examined for shipment. During the month there were 33 shipments inspected and certified, on which there were no gipsy moths found.

The New York Conservation Department advises that there were 36 scouting crews engaged in the examination of wooded areas during March in the following barrier-zone towns in New York: Kingsbury and Hebron, in Washington County; New Lebanon, in Columbia County; Stanford and Washington, in Dutchess County; Phillipstown and Carmel, in Putnam County; New Salem, Pound Ridge, Ossining, and Mt. Pleasant, in Westchester County. A gipsy moth infested site consisting of 1 old and 6 new egg clusters was found in the town of Rye, Westchester County, during March.

There are 4 scouting crews at work on Long Island--3 in Islip and 1 in the Borough of Queens. During the month a gipsy moth infestation consisting of a single egg cluster was located and treated on the east side of the Borough of Queens near the village of Creedmore.

Inspection is also being made around isolated colony sites found in previous years in Southold, Southampton, Easthampton, and Brookhaven, Suffolk

County, L. I., and also in Rhinebeck and Milan, in Dutchess County.

Upon completion of the Christmas tree inspection work in December, a great reduction in the volume of shipments offered for inspection in the New England gipsy moth quarantined area was noted. This lull in the shipping season extends itself until the spring when the nurseries begin digging and shipping. When the district inspectors are not actually engaged in inspecting products during this period, they are performing such services that not only enable them to more efficiently enforce the quarantine in their respective districts but also to take constructive measures which tend to prevent long distance spread of the gipsy moth, brown-tail moth, and satin moth. Nurseries and small areas adjoining them are scouted to determine the degree of infestation, thus securing information as to the likelihood of shipments being infested. Shippers of quarantined products are interviewed to ascertain the requirements as to the personnel needed to handle the required inspections when shipping begins, based on the estimated approximate volume of spring business. The premises of firms shipping under permit are inspected at this time as well as various places used to store finished products. If improvements can be made to further reduce the possibility of infestations being found on these products shipped under permit, recommendations are made to the firms concerned by the district inspectors. Arrangements are also made wherever necessary to expedite the inspection of quarantined products. The inspection of tourist camps further reduces the possibility of long distance spread of these insects by being transported on visiting automobiles, because wherever any infestation is discovered by the district inspectors, eradication measures are recommended to the tourist camp owners in the case of small infestations. Where large infestations are found, the matter is reported to the State authorities for their consideration. Exterminative measures, such as spraying with arsenate of lead, have been employed by the State and a report of the work given to this office. A later check-up is made of the tourist camps that were found infested in order to determine whether the owners followed out the recommendations of the inspectors and to ascertain the effectiveness of the eradication measures applied. There have been 97 tourist camps inspected during the current fiscal year, and a total of 208 new gipsy moth egg clusters and 65 brown-tail webs were found.

Nursery products which originate within the gipsy moth quarantined area are divided into three separate classes with reference to the methods of inspection and growing conditions. For our convenience, these classifications are stored stock, collected stock, and stock dug in nurseries.

Stored stock is dug during October when weather conditions permit, at which time it is inspected for the presence of the gipsy moth. It is then stored in bins where it is graded and marked. This practice enables the nurserymen to ship during the winter and early spring before the frost in the ground would allow digging. When the shipping season ends each year, such stock as is left over is usually burned or otherwise destroyed. Upon shipment of this stored stock, a certificate is issued based on the previous inspection.

Collected stock consists of native trees and shrubs not grown in nurseries. If the inspection of the trees or plants intended for shipment discloses infestation with either the gipsy moth or brown-tail moth, certification is refused on the intended shipment and also to other similar shipments of trees or plants originating in the same locality. It is obvious that under the existing quarantine the collector must avoid as far as possible heavily infested woodlots, and must clean the trees of any moth infestation before presenting them for inspection.

Stock dug in nurseries is inspected upon State certification that the nursery is apparently free from infestation with gipsy and brown-tail moths. These nurseries are inspected yearly by the State as soon after the egg laying period of the gipsy moth as possible.

During this time of the year there is a considerable market for white cedar poles ranging from 25 to 40 feet in length and measuring $4\frac{1}{2}$ inches or more at the butt end. These poles are weighted at one end by means of cement blocks which have bolts inserted in them. A rope is attached to these bolts and is then run through a hole which is made near the butt end of the poles thus tying the pole and the cement block together. They are set out 50 to 100 feet apart in the water for the purpose of marking off areas along the coastline that are leased from the controlling State by fish and oyster concerns. It is necessary to replace these poles frequently as they deteriorate quite rapidly or else are broken off by storms or ice formations. At high water the poles project from 3 to 6 feet above the surface of the water. During the month there were 1000 poles shipped by boat and 300 more by freight. Inspection is accomplished by placing the poles on wooden horses. Approximately 4 feet of the pole is examined at a time. All loose bark is removed with a knife to reveal any concealed egg clusters. There were 18 new gipsy moth egg clusters creosoted and removed from the 1,300 poles already shipped. The oyster buoy poles were harvested in the vicinity of Rehoboth, Mass., and were consigned to Bridgeport, Conn. As white cedar is abundant in swamp areas, it is necessary to wait until these areas are frozen over before the trees can be cut with advantage.

The association of paving blocks for streets with insect control work may seem remote, but a recent award to a granite company located in the gipsy moth quarantined area to furnish 5,000,000 paving blocks to the City of New York has been made. Should these be newly quarried, actual inspection of individual blocks will not be required, as they may be certified in carload lots. It often happens, however, that products of this nature are stored for long periods in such a manner and in places that afford to female gipsy moths uninterrupted opportunity for deposition of their eggs on these finished products. Conditions of this nature necessitate extra work on the part of the inspectors as each individual piece shipped must be inspected, and all egg clusters found are treated with creosote and removed before the shipment is certified for movement.

The inspection records for March clearly indicate that evergreen materials are being used more and more for decorative purposes throughout the year. From southern Vermont, 3 tons of mixed spruce and balsam boughs were inspected and certified for shipment to New York City to be used for Easter decorations in stores, lodge halls, and churches. The boughs in this shipment were approximately 3 feet long and were shipped in bales weighing about 100 pounds. There were also 22 bundles of juniper inspected and certified. This material is to be used in making sprays for decorations.
