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NEWS LETTER

BUREAU OF PLANT QUARANTINE

UNITED STATES DEPARTMENT OF AGRICULTURE

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September 1, 1932.

TECHNOLOGICAL

Repairs to Mexican border car fumigation houses are rapidly being completed. Extension to the rear of the Eagle Pass plant permitting accommodation of a 50-foot car in a single compartment and installation of sliding end doors were finished about July 1. A partition door of the sliding type was installed during the month of July at the Brownsville house to replace a set of the double swing type.

Work at Nogales covered by contract is more than half finished and the completed installations include sliding end doors, HCN gas disposal system, and new wall at rear of house, designed to eliminate flooding of the fumigation chambers during the seasonal floods which periodically inundate that part of Nogales where the plant is located. That this new rear wall apparently functions properly is evidenced by the fact that on July 9, during a flood which it is claimed reached the highest level ever recorded, no water entered the rear of the fumigation house.

A. C. Johnson reports the completion of the tests on fumigation of cotton samples with carbon disulphide. He was able to obtain complete mortality of pink bollworm in infested seed with a reasonable time of exposure. A new type of fumigation chamber for small quantities of cotton samples was designed and tested. This apparatus gave very good results, is cheap, and easy to operate.

FOREIGN PLANT QUARANTINES

RECENT ENTOMOLOGICAL INTERCEPTIONS OF INTEREST

Dark fruit fly from Mexico.--Larvae of the dark fruit fly (Anastrepha serpentina Wied.) were intercepted at El Paso and Hidalgo, Tex., in sapotes in baggage from Mexico.

Melon fly in watermelon.--The melon fly (Bactrocera cucurbitae Coq.) was intercepted at San Pedro, Calif., in watermelon in stores from Hawaii.

Mediterranean fruit fly from Hawaii.--The Mediterranean fruit fly (Ceratitis capitata Wied.) was intercepted at San Francisco in mangoes in baggage from Hawaii, and at San Pedro, Calif., in bell peppers in stores from Hawaii.

Cucujid from American Samoa.--Monanus concinnulus Walk. (Cucujidae) was intercepted at Honolulu on coconut in cargo from American Samoa.

Thrips from Czechoslovakia.--Megathrips lativentris Heeger (thrips) was intercepted at Philadelphia in sphagnum moss packing material in the mail from Czechoslovakia. J. R. Watson, of Gainesville, Fla., states that this thrips is not known to occur outside of Europe and Siberia.

Bruchid from India.--Bruchidius saundersii (Jekel) (Bruchidae) was intercepted at Washington, D. C., with seeds of Albizia lebeck in the mail from Darjeeling, India.

Thrips on tomatoes.--Erythrothrips durango Watson (thrips) was intercepted at Nogales, Ariz., on tomatoes in cargo from San Blas, Sinaloa, Mexico. J. R. Watson remarks as follows: "This is the second specimen of this insect ever taken. I described it several years ago from one single specimen from Durango."

Eurytomid in soursop seed.--Bephrata maculicollis Cam. (Eurytomidae) was intercepted at New Orleans in soursop seed in stores from Dutch Guiana.

Thrips on orchid.--An adult of Heliothrips errans Williams (thrips) was intercepted at Washington, D. C., on an orchid (Cypripedium sp.) in the express from England. J. R. Watson remarks as follows: "This thrips was described from England on orchids. Cypripedium seems to be a new host. It has been reported only from England."

Gracilariid in watermelon.--Marmara sp. (Gracilariidae) was intercepted at Nogales, Ariz., in a watermelon in cargo from Mexico.

Thrips from Puerto Rico.--Frankliniella difficilis Hood (thrips) was found on grapefruit blossoms in the field at Palo Seco, P. R. J. R. Watson reports: "I believe this is the first time difficilis has been reported from

Puerto Rico, although it is described from the Lesser Antilles."

Potato weevils from South America.--Larvae of what is probably Rhigopsidius tucumanus Heller (Curculionidae) were intercepted at Washington, D. C., in tubers of Solanum tuberosum in a departmental shipment from Peru, and larvae of Trypopermnon sp. (Curculionidae) were intercepted at Washington, D. C., in potato tubers in a similar shipment from Bolivia.

Thrips from Germany.--Thrips fuscipennis Hal. (thrips) was intercepted at Philadelphia on dry herbs in the mail from Germany. J. R. Watson states that this is a common European species, not known to occur in North America.

Coffee berry borer from Angola.--Fourteen specimens of Stephanoderes coffeae Hgdn. (Scolytidae) were intercepted at New York in coffee berries in cargo from Angola, Africa. M. W. Blackman, of the Bureau of Entomology, states that this scolytid is a serious enemy of coffee.

RECENT PATHOLOGICAL INTERCEPTIONS OF INTEREST

Interceptions deposited in mycological collections.--From time to time rare or interesting interception material is turned over to the Bureau of Plant Industry and added to their collection of fungi. During the past month these contributions have included the following items:

Diplodia cacaoicola on a young coconut from Cuba intercepted at Philadelphia; Gymnosporangium germinale on two species of hawthorn collected at Sterlington, N. Y.; Leptosphaeria azaleae on Azalea sp. intercepted at Washington, D. C.; Macrophoma (?) sp. on Prosopis glandulosa from California, collected at Washington, D. C.; Puccinia evadens on Baccharis sarothroides stems collected near Nogales, Ariz.; Septobasidium sp. on orange twig and two specimens of the same on tangerine twigs, all from Brazil, intercepted at New York; Septoria photiniae on Photinia serrulata collected near Media, Pa.; and Sphaeceloma fawcettii accompanied by Colletotrichum gloeosporioides on citrus leaves from Puerto Rico intercepted at New York. Some of the determinations are tentative only.

Violet root rot on cassava.--A cassava tuber from Cayman Islands, B.W.I., intercepted at Mobile, was infected with what appeared to be Rhizoctonia crocorum, violet root rot. (See July News Letter, p. 4.)

Badly diseased avocados.--Interceptions of diseased avocados usually show relatively small areas sporulating, the causal organism being Colletotrichum gloeosporioides in most cases. A Mexican avocado intercepted at Brownsville, Tex., was practically covered with C. gloeosporioides spore masses except for an area infected with Diplodia cacaoicola and a half inch spot covered with Fusarium sp. Several Cuban avocados intercepted at Philadelphia were a charcoal-like mass of D. cacaoicola when received, with a few spots of C. gloeosporioides.

More Botrytis sp. interceptions.--As indicated in the May News Letter, p. 5, interceptions of Botrytis sp. have been very few during the summer months in past years. Determinations of Botrytis sp. during the past month were several times the average number and included interceptions at Philadelphia on beet from Denmark, cabbage from Japan, lettuce and rhubarb from England, and an interception at Boston on string beans from England. In addition to these interceptions, inspectors of special permit material found B. paeoniae on peonies and Botrytis sp. on other plants in this country. Sclerotia on a diseased apple from Chile, intercepted at New York in June, were collected and referred to Dr. Whetzel, who has returned a tentative determination of the organism as B. cinerea.

Grape disease on rose.--Coniothyrium diplodiella, the fungus responsible for white-rot of grapes, was intercepted at the Washington Inspection House on rose from France. This constitutes apparently the first record of its occurrence on the latter host, according to an article in the August Plant Disease Reporter, p. 124. Since this might prove to be a new strain of the fungus, every effort will be made to prevent its introduction and establishment.

SPECIAL PERMIT INSPECTION CATCHES RUST

Plants imported under special permit in accordance with the provisions of regulation 14 of Quarantine No. 37, the Nursery Stock, Plant, and Seed Quarantine, are subjected to thorough inspection at the time of entry and are at that time given whatever treatment may be necessary to rid them of evident insects or diseases. Subsequently they are inspected for one or two seasons in the field to detect any pests which might have escaped observation at the entry inspection.

The value of this double system of inspection is well illustrated by a recent importation of Eremurus. Some 500 plants of two varieties of this genus were imported from Holland in 1930 by an Ohio grower. The large, fleshy star-shaped rootstocks were free from leaves and stems at the time of entry and no diseases or insects were found on them. But when the plants were inspected in the field in August, 1931, numerous pustules of a rust were found at the bases of the dead flower stalks on a small number of the plants. This rust, identified as Puccinia eremuri, is not known to occur in this country but is reported from Asia Minor and Persia. Every effort is being made to eliminate the infection from the planting and until this can be done release of the plants is being withheld.

In this typical case it may be noted that even the most careful and minute inspection at time of entry could not have disclosed this rust; and further that, without the field inspection, this disease would undoubtedly have been spread widely with the distribution of the multiplied stock.

POTATO WART FOUND IN POTATOES FROM BOLIVIA

The wart disease of potatoes (Synchytrium endobioticum) was found on July 12 at the Washington Inspection House in a departmental shipment of potatoes from La Paz and Cochabamba, Bolivia. This is apparently the first record of the occurrence of this disease in Bolivia. The shipment in question consisted of 75 different small lots of cultivated potatoes, in all, 1,618 tubers. Eleven tubers in 7 lots out of the 75 were found to bear warts of very small size closely attached to the slightly sprouted buds in the eyes, and having the appearance in many cases of small, dead, discolored buds. These potatoes, collected during the first half of June, are stated to have come from altitudes of 8,300 to 12,500 feet.

The wart disease was previously intercepted on a similar shipment of potatoes from Peru on June 28. Two of the 6 tubers in this shipment bore wart, which has been known to occur in Peru since 1929.

SMUT IN COLCHICUM BULBS

The smut disease of Colchicum (Urocystis colchici), which was intercepted at Washington, D. C., in 1931, has again been found on the first shipment of the 1932 season. The bulbs originated in Holland. The infection runs from nothing to 12 per cent, apparently varying according to the variety or possibly according to locality of origin. Higher percentages of infection were found in 1931 shipments.

DOMESTIC PLANT QUARANTINES

According to information received from the Bureau of Entomology, Cnephasia longana, a European insect discovered in Oregon about four years ago, is proving to be a serious enemy of strawberries in that State and in Washington, and is also attacking other hosts, particularly the flowers of bulbous Iris. The Bureau of Plant Quarantine is now in correspondence with State departments of agriculture with respect to the possibility of preventing further spread.

A European olive scale, Parlatoria oleae, has been discovered at Tucson, Ariz., and the possibility of its eradication is being investigated, according to word received from the Arizona State Entomologist. The only previous record of this pest in the United States is an outbreak on privet at Baltimore, Md., found in 1927 and described in the Journal of Economic Entomology for February, 1930, in a paper by H. S. McConnell.

TRANSIT INSPECTION

A combination of transit inspection and terminal inspection in co-operation with the State Plant Board of Florida, is being tried out at Jacksonville, where the work was initiated the second week in August. Inspectors are checking shipments moving into Florida for compliance with Federal plant quarantines, and are inspecting nursery stock for insect pests and plant diseases, the latter work being carried out by the State under the provisions of the postal terminal inspection law.

The enforcement of the recently issued Illinois State quarantine on account of the European corn borer was discussed at a conference of Illinois State inspectors and Federal transit inspectors in Chicago on August 5. The latter offered suggestions on the organization of the work. It is expected that State inspectors will check on express, freight, and certain boat shipments from the infested States. Other States which have established quarantines on account of this insect since the revocation of Federal Quarantine No. 43 are, according to notices received at this Bureau, Georgia, Iowa, Louisiana, Missouri, Nebraska, and Texas.

WHITE PINE BLISTER RUST

Pines State Park and Sinissippi Farms, both at Oregon, Ill., were inspected for blister rust infection on July 21 and 22, by Messrs. J. M. Corliss, of this Bureau, and William R. Jack, of the Illinois State inspection force. An examination of the large tracts of white pine and of the wild gooseberry bushes growing in abundance on both areas, resulted in finding no blister rust infection. A planting of 38 European black currants at Glenview, Cook County, Ill., was also inspected, with negative results.

NARCISSUS PESTS

The discovery of eelworms in a large proportion of the narcissus bulbs in Florida by State Plant Board inspectors in June, caused alarm on the part of the bulb growers of that State who sent a delegation to Washington to confer with the Bureau of Plant Quarantine officials on the subject. At the conference the growers withdrew their previous recommendations and asked that the restrictions on the importation and interstate movement of narcissus be canceled. Subsequently a study of the Plant Board records showed that most of the infestations were of the species Aphelenchus subtenuis and A. parietinus, and that the true bulb eelworm Tylenchus dipsaci was found in a much smaller number of plantings. Information from the Bureau of Plant Industry showed that according to recent observations, the host records, limited economic importance, wide distribution, and lack of susceptibility to hot water made it undesirable to require that treatment as to Aphelenchus-infested lots. The treatment of the Tylenchus-infested plantings is now in progress.

Assistance given to the State inspectors on bulb-pest discovery and

diagnosis this year has included the assignment of Mr. Sheals to aid in that activity in Maryland, South Carolina, and Virginia; Mr. Corliss and Mr. Conkle in Michigan; and Mr. Stillinger in Oregon and Washington. Maryland is now added to the list of States in which Tylenchus dipsaci has been found in narcissus plantings, the first discovery of the pest there being made by G. S. Langford, Specialist in Insect Control, Maryland Agricultural Experiment Station.

PHONY PEACH DISEASE

Nursery inspections to determine the number of premises whose owners are able to secure Federal permits because of the absence of the phony peach disease within one mile, are now in progress in the Southern States. Such inspections by Bureau of Plant Quarantine employees have shown the presence of the disease in several counties outside the regulated areas. General orchard scouting to determine new outlying infestations is carried on by the Bureau of Plant Industry. Consideration will later be given to the extension of the regulated area to cover new localities found this season by Plant Industry and Plant Quarantine inspectors. A new and undescribed virus disease of peach was found last year in Texas by such inspectors and has recently been named "peach mosaic" in a paper by Dr. Hutchins in a recent issue of Science.

BLACK-STEM RUST

As a result of experimental work carried on by the Bureau of Plant Industry, it is now possible to classify a number of species and varieties of barberries and Mahonias as to rust-susceptibility which have heretofore been doubtful. Accordingly, a revision has been made in PQCA-320, which gives lists of the species or varieties susceptible to the rust, lists which are nonsusceptible, and those which are undetermined as to reaction to rust attack. The revision of the circular was issued on August 15.

DATE SCALE

During the last half of the fiscal year 1932 the area under observation was reduced materially and the size of the inspection force reduced accordingly. The present force will be continued until the end of the present calendar year and then further reduction, both in the eradication area and inspection force, will be made. It is hoped that by that time most of the date-growing area will have been given its final inspection.

Because of the habits of the Parlatoria date scale and the structure of the date palm, old infested gardens and plantings of offshoots from infested properties will have to be watched for a longer period. Considerable scouting outside the date-growing areas also remains to be done and further inspection

of palms other than date in the infested areas.

During July most of the Indio district in the Coachella Valley was inspected and no *Parlatoria* scale found. No scale has been found in this district in the past 18 months and no new infested properties since August, 1929. Several heavy infestations were found here in 1927, and a number of lighter ones resulting from the dissemination. Three large gardens each with several thousand palms, some over 20 years old, were found infested, and it was thought at the time the work was reorganized in 1928 that if this area could be cleaned the project would be successful.

For various reasons the work in the Imperial Valley is not as far advanced as in the Coachella Valley and in Arizona, but steady progress has been made there and by extra effort this fall it is hoped that a considerable portion of that area may be declared free of *Parlatoria* scale.

EUROPEAN CORN BORER AND JAPANESE BEETLE

Exclusive or Combination Japanese Beetle Work

State agricultural officials from Ohio, West Virginia, Virginia, Maryland, Pennsylvania, New Jersey, and New York attended a Japanese beetle tour and conference held on July 20 and 21. From headquarters at the Hotel Pennsylvania in Philadelphia, the party proceeded to Bridgeton, N. J., stopping en route at four farms to observe damage by the Japanese beetle. On one farm balling of the beetles on ripening apples, peaches, and plums was seen, together with extensive foliage damage to grapes, corn, and blueberries. A stop was made at the experimental trap plot in charge of E. S. Rex, of the New Jersey Department of Agriculture. Traps distributed over an area of approximately 75 square miles under Mr. Rex's supervision had caught in the neighborhood of 350 barrels of beetles. A field of rhubarb showing heavy foliage damage was next observed. A final stop before lunch was made at an orchard of Del-Bay Farms. The latter orchard showed less damage from the beetles, since this is the first year that the beetle invaded that locality. A stop for lunch was made in Bridgeton. The party then proceeded to the Farmer's Auction Market of the Cedarville Cooperative Marketing Association. Two mechanical bean separators used for removing Japanese beetles from beans shipped under certification from the infested area were demonstrated. The tour then proceeded to the experimental field of the Bureau of Entomology near Woodstown, where experiments to determine improved trapping practices were explained by Fred Metzger, of the Moorestown research laboratory staff. The tour then proceeded across the Palmyra-Tacony Bridge to the Bureau of Plant Quarantine's demonstration plot in the rear of Sears, Roebuck & Co.'s plant on Roosevelt Boulevard, Philadelphia. At that point 132 traps are placed on soil poisoned with arsenate of lead. The party then returned to headquarters at the Hotel Pennsylvania. An

evening conference was held in the hotel, with Mr. Worthley acting as chairman. Results of the season's trap-scouting activities in unquarantined States were detailed by O. K. Courtney. Following statements on the Japanese beetle situations in New Jersey and Pennsylvania by Dr. Headlee and Dr. Guyton, remarks were made by Messrs. Norgord and Van Buren of New York, Dr. Koiner of Virginia, Dr. Langford of Maryland, Mr. Ellenwood of Ohio, Mr. Hoyt of the Bureau of Plant Quarantine, and Messrs. Rohwer and Hadley of the Bureau of Entomology. The second day's tour included a trip to Valley Forge, affording an opportunity for observance of foliage damage to shade and ornamental trees, and an afternoon visit to the Japanese beetle research laboratory of the Bureau of Entomology at Moorestown, N. J. At the laboratory Dr. J. L. King explained the parasite work, Dr. Henry Fox outlined the biological phases of the research activities, and Dr. W. E. Fleming conducted the party through the experimental field plots. In addition to staff members of the Japanese beetle project, those comprising the party were F. Waldo Craig, Department of Agriculture, Charleston, W. Va.; W. W. Ellenwood, Chief, Division of Plant Industry, State Department of Agriculture, Columbus, Ohio; Dr. G. W. Koiner, Commissioner of Agriculture, Richmond, Va.; George S. Langford, Specialist in Entomology, College Park, Md.; C. P. Norgord, Assistant Commissioner of Agriculture and Markets, and B. D. Van Buren, Director, Bureau of Plant Industry, Albany, N. Y.; Dr. T. L. Guyton, State Entomologist, Harrisburg, Pa.; Dr. Thomas J. Headlee, State Entomologist, New Brunswick, N. J.; Harry B. Weiss, E. S. Rex, and C. J. Grant, New Jersey Department of Agriculture, Trenton, N. J.; S. Mendelson Meehan, representing Florists' Exchange, Germantown, Philadelphia, Pa.; S. A. Rohwer, Assistant Chief, Bureau of Entomology, Washington, D. C.; C. H. Hadley, Bureau of Entomology, Moorestown, N. J.; A. S. Hoyt, Assistant Chief, Bureau of Plant Quarantine, Washington, D. C.; A. F. Burgess, In Charge of Moth Work, H. L. Blaisdell, and Frank Anderson, Bureau of Plant Quarantine, Greenfield, Mass.; R. M. Merrill, Bureau of Agricultural Engineering, U. S. Department of Agriculture, Toledo, Ohio; and Frank Irons, Bureau of Agricultural Engineering, U. S. Department of Agriculture, South Norwalk, Conn.

Initial fumigation of carloads of bananas under the recently authorized liquid hydrocyanic acid procedure was made on July 14. Since this method is considerably more dangerous for the operators than fumigation by means of powdered calcium cyanide, gas masks equipped with canisters capable of filtering out the deadly gas are worn by the three men who complete the operation. Prior to injecting the fumigant, bananas are loaded in refrigerator cars in the usual manner for shipment and the car doors tightly closed. Hatches at diagonal corners at each end of the car are raised, the metal covered plugs removed, and galvanized iron trays lowered into each bunker. The trays are suspended by four chains equipped with hooks which fasten over the hatch strips. In each of the metal trays is placed a tin can with a 3-ounce capacity, to which is attached a string held by one of the operators. Hydrocyanic acid is carried about in a pressure tank somewhat resembling a medium-sized fire extinguisher. The tank is equipped with a pressure gauge to determine when additional air pressure is needed and has a valve on top which is closed by a key when the tank is not in use. A 6-foot rubber hose leads from the pressure tank to a spray gun trigger

equipped with a small-diameter steel nozzle 36 inches long. When everything is in readiness, the three operators on the roof of the car and under the scrutiny of a Japanese beetle inspector, rapidly fill the 3-ounce tin with the fumigant. A pull of the string spills the contents of the can into the larger metal tray and the can is hurriedly pulled out. The plug is then placed in the hatch opening and the hatch tightly closed. The same operation is immediately repeated in the previously prepared bunker at the other end of the car. Two hours must elapse before the car may be opened for ventilation. At the expiration of the fumigation period the hatches are opened, the trays removed, and the hatches are either closed or screens of mosquito netting are fastened over the hatch openings if the car is to be shipped with open hatches. The door on one side of the car which had been screened with netting before fumigation is also opened for a short ventilating period. Any beetles clinging to the outside of the door screen are removed before the doors are finally closed and sealed. Fifty-three carloads were fumigated the first day. Seventy-two cars of bananas were fumigated in this manner during July. An additional 92 cars were fumigated by the previously used method employing powdered calcium cyanide as a fumigant. A total of 133,164 bunches of bananas were shipped from Philadelphia under certification during the month.

Radburn, a community of 2,000 population located about 5 miles east of Paterson, N. J., and 80 air-miles northeast of Riverton, the site of the original infestation in the State, has inaugurated its own Japanese beetle suppression campaign. In the course of administering community affairs, Major John A. Walker, manager of the Radburn Association, discovered a rather general infestation of the beetle in the town. Confronted with a desire on the part of the community to control the pest, Major Walker decided to utilize the children of the town as beetle collectors. Beginning July 10 and continuing for three days, 75 school children of Radburn eagerly scouted the town for beetles. A total of 10,000 beetles was collected in this manner. One child collected over 2,000. The children were paid for their efforts at the rate of one cent for each beetle caught. Naturally the children were paid only for beetles collected within the limits of Radburn. At the end of the drive the town also treated the youthful scouts to an ice cream, pie, and cake festival. Commenting on the results of the campaign, a Paterson paper said, "When the drive ended at 5 o'clock last night, the major's office contained nearly ten thousand specimens, and the depression, as far as it has affected ice cream and lollipops, was, at least temporarily, in the background." A second contest began on July 20 and resulted in the collection by the end of July of over 20,000 additional beetles. This time the children received the sum of one cent for each three beetles. At Spotswood, Middlesex County, N. J., almost within the section of densest infestation this year, the Garden Club has offered three prizes for the children catching the most beetles. These efforts at extermination recall similar attempts during 1919 by the State of New Jersey in cooperation with the Bureau of Entomology. The 1919 drive is described in a New Jersey publication as follows: "Collecting the beetles by hand in the heavily infested area has been practiced the past season and as a result 900 pints or a million and a half of beetles, representing possibly 45,000,000 grubs of the next generation, were gathered. A few of

these beetles were collected by members of the regular force, but most of them were gathered by boys of the neighborhood who were paid 80 cents a quart. One ten or twelve-year-old boy collected as many as 75 pints in one month."

References to the Japanese beetle are frequently made by newspaper columnists writing for Philadelphia and New York City metropolitan dailies. The practice now seems to have spread to sports writers as indicated by headlines such as "Golf Bug Spreads Like Jap Beetle At Season's Peak." Late in July, the Japanese beetle furnished one baseball writer with an alibi for the loss of a game by the New York Yankees to the Philadelphia Athletics. Several quotations from the Cleveland-written article are of interest: "Should the 'Canadian Soldiers' of this community (said 'soldiers' being prankish and bothersome insects that drift off Lake Erie to spend their summer vacation here), give the Yanks as much trouble as they were caused yesterday in Philadelphia by the annual July visitation of the army of 'Japanese beetles,' the local ball team may have an advantage in the crucial series that starts today. Due to the Japanese beetles and other plaguish circumstances the Yanks suffered a defeat at Shibe Park. The Japanese beetles that infest the A's park in summer are pretty, greenish bronze creatures, and they often furnish amusement on their visits to the press box, the telegraphers electrocuting them on contact points of their sending contrivances, known to the trade as 'Bugs'. But the ball players down on the field have neither the time nor the apparatus for thus dealing with the beetle pests. All they can do is make passes at the insects and try to wave them away. For some reason the Japanese beetles yesterday concentrated their attack on the Yankee's pitching staff. This onslaught caused the Yankee pitchers to become wild. In making numerous passes at the beetles they found themselves issuing a number of passes to the A's batters." In detailing a game between local teams in Philadelphia, another writer described the third baseman as covering the infield "like a swarm of Japanese beetles on Rittenhouse Square."

Rotary tillage trials in a commercial nursery were recently conducted in New Jersey with the State-owned rotary tilling machine. Preliminary to the application of the lead arsenate, one-third of an acre plot was prepared in accordance with the disinfection instructions which require the thorough cultivation of the soil, working it away from the plants, the breaking of the middles, and the removal of at least 2 inches of soil from about the base of the plants. Another third of the plot received about one-half the required amount of soil removal, and the final third received no cultivation except the breaking up of some large lumps of soil from about the base of the plants and in the middles. Application of lead arsenate at the rate of 1,500 pounds per acre was accomplished by means of spraying apparatus furnished from the South Norwalk headquarters. The spray mixture was prepared at the rate of 1 pound of lead arsenate to each gallon of water. Final operation of the treatment consisted of uniform cultivation in the usual manner of one-half of each third of an acre and machine rotary tillage of the remaining half. In the fall, diggings will be made to determine presence or absence of beetle larvae in the infested sections subjected to the different treatments. Analyses will also be made next

spring to ascertain the lead arsenate content in the upper 3 inches of soil in the variously treated plots.

For the purpose of determining absence or presence of Japanese beetles on classified nursery and greenhouse premises, field scouts began their annual survey in Virginia and the District of Columbia on June 10. Nursery and greenhouse scouts commenced their activities in Maryland on June 13, and in Delaware on June 24. Similar work in New Jersey began on July 5, in Pennsylvania on July 7, and in New York, Connecticut, Rhode Island, and Massachusetts on July 21. At the peak of the scouting activities late in July, a total personnel of 139 was engaged in this work. Practically all scouting within the regulated zone this year is confined to nursery and greenhouse premises and properties adjacent to such commercial establishments. Surveys of this nature are an annual feature of the nursery and greenhouse supervisory work. Under the regulations the degree to which nursery and ornamental stock is eligible for shipment to uninfested territory depends upon the extent of Japanese beetle infestation on or in the vicinity of the nursery premises. Frequent examinations during the presence of the adult are therefore made to accurately determine the status of each establishment for the period following cessation of adult beetle flight.

Scouting activities with traps were at their peak late in July. Traps distributed for the purpose of detecting infestation in cities and towns outside the regulated zone were operated in 201 different communities. These comprised 3 cities each in Florida and Georgia, 4 cities in South Carolina, 5 cities in North Carolina, 24 localities in Virginia, 35 communities in Maryland, 3 cities in West Virginia, 44 towns and cities in Pennsylvania, 12 cities in Ohio, 36 cities in New York, 28 communities in Massachusetts, and 2 cities each in New Hampshire and Maine. In the infested territory traps were used for control purposes in 30 localities, including 5 towns in Virginia, 18 communities in Maryland, the District of Columbia, and 3 localities each in Delaware and Pennsylvania. By July 31 lifting of traps had been accomplished in most of the extreme southern cities.

Over a ton and a quarter Japanese beetles were collected from July 8 to 31, inclusive, in 500 traps placed on six widely scattered lots in the city of Philadelphia. The largest catch of 631 pounds was made at 69th and Chester Avenues, a considerable distance from the river-front district. The smallest of the catches was that of 202 pounds collected alongside Pier 80, South Wharves, at Delaware Avenue and Jackson Street. Under normal conditions all traps are emptied daily by the supervisor and two assistants assigned to the Philadelphia trapping demonstration. A rank growth of goldenrod which overtopped the stand of smartweed on one of the plots was cut off with scythes by men from the Oakmont office. Philadelphia has been infested with the beetle since 1922.

Requests for inspections at the farm products inspection platform in Baltimore Center Market increased during the month due to the discovery of Japanese beetles on a number of farms that theretofore had been free from infestation.

Prior to the collection of the beetles on farm premises it had been possible to certify articles of quarantined produce therefrom without actually handling the articles, on the basis of freedom from infestation of the general section in which the vegetables and fruits were grown. Farms determined as free from presence of the insect are given an accredited status. Periodic surveys of the farms are necessary to keep accurate check on the beetle conditions in the locality.

As is annually anticipated, flight of adult beetles in the market and river-front districts of Philadelphia early in July became so heavy that the hours during which inspection of farm products might be obtained was confined to the beetle's daily period of inactivity. Commencing at midnight on July 11, inspection service was daily furnished only between the hours of 8 p. m. and 10 a. m. Lack of trading in the markets permits closing of the inspection platform from 10 a. m. Saturday until midnight Sunday.

That section of an article appearing in a recent issue of a trade journal which relates to the report of the quarantine committee of the American Association of Nurserymen states that, "A. F. Meehan, for the Quarantine Committee, reported an active year in which relations with the P. Q. C. A.* * * had continued most pleasant. He touched on developments in the phony peach and Japanese beetle quarantines; told of the four hearings in March at which he, for the Association, formulated and put on record a statement of principles;* * *."

J. P. Johnson, cooperatively employed agent in charge of the Japanese beetle quarantine in Connecticut, on July 1 moved his office from the project headquarters in South Norwalk to space provided for his use at the Connecticut Agricultural Experiment Station, Huntington Street, New Haven. Telephone number of the new district quarantine office is New Haven 5-5078.

Among the interceptions of quarantined material arriving at road posts without certification during July was a lot of two evergreens being transported by a motorist from Allentown to New Kensington, Pa. Examination of the soil about the roots of the evergreens disclosed two adult beetles, one larva, and four pupae, which were subsequently identified as Popillia japonica.

Japanese beetle traps were set up in the following cities in the Western Area: Ashtabula, Canton, Cincinnati, Cleveland, Columbus, Dayton, Massillon, Steubenville, Toledo, Wooster, Youngstown, and Zanesville, Ohio; Detroit, Mich., and Wheeling, W. Va.

Nursery and greenhouse scouting in the Central Area began on July 18, with 10 crews reporting in Bridgeport for schooling. The schooling consisted of an illustrated lecture on the Japanese beetle, followed by a general instructive talk. The foremen of the crews were then given information as to the procedure to be followed while scouting, public relations, and instructions on making out the necessary reports. The men were assigned to their routes and certain sections in Bridgeport were allotted for field training. Schooling was completed

at noon on July 20 and crew foremen were brought to Norwalk for cars, leaving directly afterward for their field stations. Crews were assigned as follows: Norwalk, 1; New Haven, 2; Hartford, 2; Shelton, 1; Norwich, 1; Springfield, Mass., 1. Two other crews were assigned to spread scouting with no definite headquarters.

The placing of traps in the Hartford-Springfield area began on July 18 and continued through July 30. On July 31 the traps were baited and the actual trapping work was in progress.

The spread scouting crew that is determining the absence or presence of beetles in the principal cities in Connecticut not previously found infested has picked up beetles in Bristol and New Britain, the two cities thus far completely scouted.

Experimental trapping is being carried on by the State of Connecticut in and around three nursery and greenhouse concerns to learn whether or not beetles are present. This work is being done in competition with the scouting by nursery and greenhouse scouts. Approximately 100 traps are placed on and in the vicinity of these three concerns--Golden Hill Nursery at Shelton, Sokol's Greenhouses at New Haven, and Thomas' Greenhouses at Hamden.

On July 19, in company with several other project men, Messrs. H. N. Bartley, T. M. Cannon, and J. Peter Johnson attended the field meeting at Philadelphia to visit the heavily infested areas of New Jersey and Pennsylvania and to view the damage done by the Japanese beetle.

Specialized Corn Borer Activities

A training school for European corn borer scouts for the Western Area was conducted at the Government experiment farm operated by the Bureaus of Entomology and Agricultural Engineering near Toledo, Ohio, from July 20 to 30, inclusive. A group of 178 men registered for the first school on July 20. Two failed to pass the test and two resigned. One hundred and seventy-four were sent to the field for scout duty on July 25. The second group of 48 men registered for the scout school on July 27, all of whom were sent to the field on August 1 for scout duty. On account of the limited time each of the two groups were given four days of intensive training, previous arrangements having been made for the use of the experiment farm and with sweet corn growers in that vicinity for the use of fields of corn for inspection of infestations. Fifty or more sweet corn growers offer the use of their fields each year for this purpose, where the men are permitted to examine, cut open, and cut off tassels of the infested plants to better observe the work of the corn borer. These farmers grow on an average of 1,000 acres of sweet corn each year. As soon as the men had been registered and had turned in their notice of appointment they were divided into squads of 14, each squad under a designated leader, for the purpose of orderly conduct. They were then assigned to convoy trucks which transported them to and from the school and to the fields. Experienced men accompanied each

squad into the fields on the experiment farm, where they were shown indications of borer infestation in the stalks and leaves of the corn plants. They were afterwards taken into the fields of the sweet corn growers for closer observance and examination of the plants for the work of the corn borer. During this time, plots on the experiment farm were checked and rechecked for stalk and leaf damage, and records were made of each plot for the final test. The rows were lettered and each of the 50 hills in a row were numbered. Here the men were taken for the final test as to their adaptability for the work. The man in charge of each test plot had each man stand facing him, with their backs to the rows they were to examine, while he told them of the rules of the examination. Then each man was given a card on which he wrote his name, the date, the letter of the row, and the starting time. They then turned and faced their respective rows and when time was called, they started examining the plants and recording both leaf and stalk infestation damage. One-half hour was allowed for the test. None of the men were permitted to talk while taking the test. After the test was made, the cards were checked and graded. Those who made 70 per cent or more of the hills containing stalk damage were permitted to go scouting. The men were trained to observe both stalk and leaf damage. Those who made high grades on both were considered eligible for survey work. It is a known fact that leaf damage is rarely, if ever, noticed on outside scouting until after the stalk damage has been observed. The different squads were assembled at odd times in tents erected for that purpose in a 5-acre wood lot on the experiment farm, where all were given lectures on the life cycle and seasonal history of the borer, the damage caused by it and methods of control, and personal conduct and approach of farmers. All of the men who were selected for foremen were again assembled for instructions relative to the proper method of making out reports, packing of specimens to be sent to the laboratory for determination, operation of cars, purchase of repairs, and reports of personal injury and motor transportation accidents. The foremen were selected by observance of their interest and attitude in the field, together with the grade made in the final test, and if they were experienced men, their past record was taken into consideration. In the first school, 22 of the men fell below the grade of 70 per cent in the final test on both leaf and stalk damage; however, all but 2 made a passing grade on the stalk damage, and those 2 were not permitted to go scouting. In the second school, 4 failed to make the passing grade. None, however, failed to make the grade in the stalk damage and all were permitted to go scouting. It is of interest to know that the four failures in the second school all happened in the same row. Some of the indications on the plants in this row were not very noticeable and when the test plot men made their check of the plots, it was necessary for them to check this particular row seven times before they were sure it was correct. The men in the first school made an average grade of 70.7 per cent, while those in the second school made an average grade of 85.3 per cent. There were two 100-per cent grades in the first school, one of which was made by a man who had no previous scouting experience, and the other was made by a man who had scouted five previous seasons. In the second school there was one 100-per cent grade. It was made by a man with three seasons' experience in scouting. A group of 16 men, who were furnished and are being paid by the State of Illinois, were included in the men who went through

the first school. They are working in Illinois under the supervision of the Bureau of Plant Quarantine. The State of Wisconsin is furnishing six men, who did not go through the school, who are working in cooperation with and under the supervision of the Bureau of Plant Quarantine.

The scouting work is all being carried on beyond the areas found infested in 1931, in the following States: Indiana, Illinois, Wisconsin, Kentucky, and West Virginia. An isolated infestation was picked up during the first week the scouts were in the field in Mt. Pleasant Township, Racine County, Wis.

Effective on and after July 15, the European corn borer quarantine was revoked and all quarantine operations ceased.

On July 25, scout school opened at Freehold, N. J., with 66 men reporting. These men were schooled for a 5-day period and then sent to their locations in the field on Saturday, July 30, to begin work on August 1. Itineraries call for scouting in New Jersey, Pennsylvania, Delaware, Maryland, and Virginia.

MEXICAN FRUIT WORM

As stated in the last News Letter, the groundwork of a Valley-wide poison bait spray program was laid in the latter days of July. Five tank cars of blackstrap molasses and 36 drums of nicotine sulphate were received and distributed to 13 supply depots. Bids were received and orders placed for 345 knapsack sprayers by the State of Texas and the three counties concerned. Since this quantity of sprayers was not carried in stock, immediate delivery could not be made, which handicapped the program considerably.

Due publicity had been given in the local press and in talks made before civic and luncheon organizations advising the growers to secure the poison material and apply it to their trees. Demonstrations were made by the county agricultural agents and the entomologist at the experiment station, showing the method of mixing and applying the bait. These meetings were exceptionally well attended by growers.

Under the organization set-up for dispensing the material, the grower was required to go to the office of the district inspector where he was issued a requisition for the amount of material needed on his trees. This requisition was taken to the supply depot where the material and a knapsack sprayer were issued to him by a State inspector. If no sprayer was available he was advised when one would be delivered to him. The assistant district inspectors contacted the growers who had not been in for their materials, checked the application of the bait, and saw to it that the sprayers were kept in constant use and promptly transferred upon the completion of a job of spraying.

The actual application of the bait to the trees began during the first week in July. The delay in the delivery of the sprayers and a spell of rainy weather during the first two weeks of the month seriously handicapped the spraying program and the work did not get under full swing until near the middle of the month. The first application of the bait was practically completed by the end of the month, there remaining only a few groves which for one reason or another had not been sprayed. It appeared at the end of the month as if practically 100 per cent coverage would be had of all bearing trees. During the month requisitions were issued for 17,579 gallons of molasses and 880 gallons of nicotine for application to the trees in 6,277 groves. Town lots are not included in these figures.

As in all campaigns of this nature, a good majority of the growers availed themselves of the bait material on being notified that it was ready for distribution. Others of a procrastinatory nature had to be contacted several times by the inspectors and educated on the importance of the bait spray. Many difficulties developed in the handling of abandoned and absentee-owned properties, necessitating the development of many lines of approach in the handling of these properties. Numerous such places were sprayed by owners of neighboring groves, county convicts were used in a number of abandoned groves, and several luncheon clubs appropriated money for the payment of labor used in spraying such properties. The back-yard plantings in most of the cities were sprayed by labor furnished by the cities or by the chambers of commerce. Most of the cities detailed labor from the street department to apply the spray. However, one city utilized the mosquito spraying unit, another was sprayed by a troop of boy scouts, another was paid for by a collection taken up by local business men, and luncheon clubs donated funds to spray several of the smaller towns.

Only one direct refusal on the part of a grove owner to apply the spray was encountered during the month. If this man can be prevailed on to apply the bait it seems certain that practically 100 per cent coverage will be had of all bearing trees in the quarantined area. The successful culmination of this campaign has called for the most consistent drive and exhibition of resourcefulness the inspectors have ever been called upon to make.

Very little inspection work was done on the American side of the river during the month, as the time of the inspectors was devoted wholly to the spray program. The operation of the traps in Matamoros resulted in taking two adult fruit flies from different premises during the month. The routine poison bait spray program was immediately inaugurated in the four blocks surrounding these premises. On July 12, a larval infestation was found in sour oranges produced in a premise at 8th and Herrera Streets. A total of 1,521 sour oranges were removed from the trees at this place, 14 of which were found to be infested. This is the first larval infestation which has occurred in locally-produced fruit in Matamoros since June, 1931. The production of clean fruit in Matamoros for over a year in spite of the constant influx of infested material from other parts of the Republic speaks very highly for the efficiency of the poison bait spray.

In cooperation with the Mexican inspector, all fruit was stripped from the trees in the four blocks surrounding the infested premise. This work was completed on the 15th, and the trees within this area were given an application of bait spray on the same day. Inspection of the fruit taken from these trees gave negative results.

PINK BOLLWORM

A thorough survey of both the east and west coast counties of Florida for wild cotton, dooryard plants, and plantings of domestic cotton, was completed during the month of July. All plants found were given an intensive inspection for the presence of the pink bollworm. A new infestation was located on the east coast in dooryard plantings of domestic cotton at Lake Worth, near West Palm Beach. On the west coast infestations were found in wild cotton as far north as Terra Ceia, which is just north of Bradenton. Wild cotton was found north of Terra Ceia, but it was not infested.

The eradication of wild cotton along the west coast was begun on July 21. The infested cotton growing near the highways was first destroyed so as to prevent any spread of the insect. Also, all of the area in the vicinity of Terra Ceia has been cleaned. At the end of the month the work was progressing very satisfactorily, and it was conservatively estimated that around 20,000 plants had been destroyed. The infested cotton at Lake Worth was also destroyed.

The eradication of wild cotton was resumed on the keys south of the mainland. When the preliminary survey was made in June quite a bit of the land was in a swampy condition due to the rainy season. Since then the land has dried up considerably, and a more thorough survey can be made. Quite a bit of wild cotton has been found in some of these swampy areas. It is more difficult to remove this cotton because of the fact that it is growing amongst vegetation of similar height, making a rather dense mass. All wild cotton had been removed from four of the main keys at the end of the month, and the remainder will undoubtedly be completed very shortly.

A survey has also been made of the counties of northern Florida to secure information as to the commercial cotton acreage, number of gins, and to determine when it will be advisable to begin inspection work. It has been found that there are slightly over 30,000 acres in cultivated cotton, which is estimated to produce around 10,000 bales. There are 26 active gins in these counties, and in most cases they were not found to be equipped with special cleaning machinery, so that we will not be able to obtain the best class of trash for inspection with the gin-trash machines later in the season.

The daily inspection and destruction of all blooms on the cotton at Chapman Field has been continued during the month. When this work was first begun

approximately 50 per cent of the blooms were infested, but at the end of the month this infestation had been reduced to between 10 and 15 per cent. This would seem to indicate that the program being followed at Chapman Field will eventually result in the complete eradication of infestation from that cotton. The Bureau of Plant Industry has recently destroyed 2 out of every 3 rows of this cotton in 2 of the 3 plots. After the infestation has disappeared, final disposition will be made of the remaining cotton.

Field inspection is now going forward very rapidly in the Salt River Valley of Arizona. At the beginning of the month the inspection was confined to squares and blooms, but toward the end of the month the cotton had developed so that plenty of green bolls were available. There has been a considerable reduction in the cotton acreage this season, and at the end of the month quite a bit of the acreage had already been inspected. Most of the sections which had previously been infested were covered, and it is especially gratifying to know that no signs of the insect have been found so far this season.

Laboratory inspection has progressed very satisfactorily. At the close of July, over 900,000 bolls had been inspected at the San Antonio laboratory, and over 2,900 pounds of seed at the Alpine and El Paso laboratories. No infestation has been found in any of this material, which came from cotton fields covering most of the Cotton Belt.

The Thurberia Plant and Weevil Survey in southeastern Arizona, which was begun in January, has been completed. This work was somewhat handicapped toward the end, but the remaining area was covered in a very satisfactory manner. No new plant colonies or infestations had been found since those last reported. The Thurberia plant when in full bloom is very attractive, and has on many occasions been moved to other parts of the State of Arizona and into other States for ornamentals. It was therefore considered advisable to remove all plants that were immediately adjacent to the highways. Most of these have already been removed, and the remainder will be very shortly.

The inspection of cotton fields in the Tucson area was begun the latter part of the month. These inspections are for both the Thurberia weevil and pink bollworm. The results have been negative thus far.

PREVENTING SPREAD OF MOTHS

Upon the cessation of spraying operations, the equipment and supplies not used are returned to the Greenfield storehouse by the sprayer and commercial trucks. As the spray hose is unloaded, it is graded in accordance with the year of its purchase. It is then cleaned of the residue arsenate of lead and fish oil by forcing clear water through it by means of one of the sprayer pumps. The hose is then subjected to a pressure test and examination to determine whether

any leaks or other weaknesses have developed during the spraying season. The pressures run from 400 to 1,000 pounds and are applied with reference to the age of the hose. If any weaknesses appear, the hose is repaired if it is practicable to do so. After the hose has been tested and repaired, it is piled lengthwise in separate compartments according to the test pressures. At the end of July, there were approximately 127,000 feet tested, examined, and stored in this manner. This represents approximately all of the high-pressure spray hose owned by this project.

When the sprayer trucks are returned from the field, the equipment is removed and checked. Replacements are made when necessary on account of tools becoming unfit for further service. Lockers are being assembled and painted at the Greenfield shop for storing the wrenches, hammers, nozzles, etc., of each machine. There is now in progress the erection of 52 of these lockers in one of the storage buildings. At the end of July, 38 of these had been built. These lockers are all steel and measure 2 feet wide by 2 feet deep by 5 feet high. They are equipped with shelves for the small tools and a section running from top to bottom in which the long tools, such as axes, shovels, and nozzles, may be placed. Each sprayer truck will have a locker and the U. S. D. A. number of the truck will be painted on it. In addition to being an ideal method for storing the sprayer truck tools and spraying accessories, it facilitates the equipping of the trucks the next spraying season and also expedites the inventory work.

The sprayer trucks are equipped with spraying tank units that are interchangeable with commercial bodies. Usually six of the sprayer trucks are equipped with commercial bodies during the year for hauling work. In order to easily handle the sprayer tank units that have been removed, two rigs or carriages have been developed from parts that were salvaged from dismantled light trucks. The tank unit rests on skids which have been attached to the strengthened chassis and running gear. When the spraying unit is removed by means of a hoist, it is lowered onto the carriage and can then be towed to any convenient place for storage.

During July, the gipsy moth reaches the adult stage in New England. The scouting and extermination work is limited this year on account of reduced appropriation and most of the men employed in that group now are engaged in seasonal work. This work consists of making observations to determine the extent of the area defoliated and the degree of defoliation caused by gipsy moth feeding; the collection of gipsy moth female pupae to obtain virgin adults from which attracting material is prepared to be used in the assembling cage work; and the placing of traps or assembling cages at various points in the barrier zone to catch male gipsy moths if any are present in that area. Employees not engaged in the above-mentioned seasonal work patrolled burlap-banded trees in the infested towns in the barrier zone. The band is a strip of burlap about 8 inches wide tied around the trunks, shoulder high. The gipsy moth caterpillars seek shade during the heat of the day and these burlap bands afford likely places for them to rest and also to pupate. The men destroy any of the larvae or pupae found under these bands by crushing them. During July, there were 187

caterpillars and 18 pupae destroyed beneath the burlap bands in the barrier zone. Barbed wire fences that were erected for temporary use in preventing live stock from grazing in sprayed areas were examined during the month. It is sometimes necessary to repair, strengthen, and relocate these fences during the season. The release of even a few acres of pasture land is very important to some owners due to the continued drought in New England this year.

Temporary facilities were obtained in Middleboro, Mass., a town located about 20 miles south of Boston, for conducting work incidental to the preparation of attracting material that is used in the assembling cage work. Temporary racks on which trays are placed were installed. These trays are used for holding the female pupae. Special boxes have been prepared to put the pupae in as they are collected in the field. A piece of absorbent cotton is placed in the box on the bottom, on top of which is a removable cardboard divider which separates the box into four compartments each large enough to hold approximately 100 pupae. The top is removable and has a hole in one section of it to permit the dropping of collected pupae into a compartment. When about 100 pupae are dropped into a section, the top is moved so that the hole will come over another empty space. Keeping the pupae separated in the boxes in this manner prevents heating and reduces injury of them. When the box is filled, the cover and divider are removed and the piece of absorbent cotton with the pupae in it taken out and placed on a tray. Great care is used in handling the pupae to avoid damaging them in the slightest degree. As the adults emerge they are picked off the sides of the trays and placed in pasteboard boxes which have small perforations on their sides to allow the entrance of air. About 200 female moths are placed in each of the boxes. The adults are held in the boxes for 24 hours after emergence as it has been determined that the attracting power of the resultant material is stronger when this is done. Into wide mouth flint glass 4-ounce bottles is poured 1 ounce of the solvent to be used in preserving the material. These solvents are high-test gasoline, benzol, and xylene. The posterior abdominal ends of the female moths are cut off with a pair of scissors and dropped into the bottle with the solvent. Fifteen clippings are put into the bottles containing the high-test gasoline or xylene and 30 clippings into the benzol. This ratio is maintained because of the fact that the material in the benzol solvent is held over in cold storage at a temperature of about 32° F., to be used a year later for early caging in the barrier zone and in New Jersey. After the tips are placed in the bottles they are sealed with a cork stopper over which is placed a wet cellulose cap. As this cap dries out, it draws tightly around the neck of the bottle.

In connection with this work, there were a number of check cages put up in the vicinity of Middleboro, Mass., to determine the effectiveness of the stored material that was prepared last year as well as this year's fresh material. The results of the checks were very satisfactory and many male moths were caught at cages containing both types of material.

There were collected over 400,000 female pupae during the season from which were secured enough female tips to charge approximately 7,000 cages. About 3,000 of them were put out this season and the remainder are to be held over for use next summer.

There were 1,907 assembling cages put out in New Jersey this year, all of which were charged with material that was held in cold storage from the past season. These cages are being visited periodically by the New Jersey State force. To date, there have been no gipsy moth catches reported in New Jersey.

The placing of assembling cages, containing the attrahent, throughout the barrier-zone area and in New York State is still in progress. This work has been completed in some of the towns. No male gipsy moths were trapped during July at any of the cages visited.

Complete defoliation records are not as yet available although it is safe to say at this time that there is considerably more defoliation in New England this summer than last season.

There were approximately 42,000 acres in Maine which showed evidences of gipsy moth feeding. Defoliation was observed in Maine as far north as Leeds, Litchfield, Oxford, and Fryeburg.

Approximately 38,000 acres in New Hampshire have been reported as affected by gipsy moth feeding. This is not a final figure as the records are not complete. The heaviest defoliation in New Hampshire occurred in the vicinity of Ossipee, Freedom, Madison, Conway, Effingham, and Concord.

In Massachusetts there has been a very great increase in the extent of area defoliated as well as in the degree. This increase has been principally in the section south of Boston embracing the counties of Bristol, Plymouth, and Barnstable. Noticeable feeding has been observed as far west as Gill, Southampton, and Westfield.

In Rhode Island the gipsy moth infested area increased. No extensive survey of Rhode Island was made but reports from the quarantine inspector there indicate that there is more defoliation than usual. Severe defoliation was reported at Scituate, Smithfield, South Kingston, and Westerly. In some of these towns there were trees completely stripped of foliage.

Several areas in Connecticut in Groton and Brooklyn showed evidences of heavy feeding.

The gipsy moth was discovered late in July in northeastern Pennsylvania near Pittston, in Luzerne County. Harrison Tietz, a former employee of the gipsy moth laboratory, who is now a professor at the Pennsylvania State College, forwarded to the gipsy moth laboratory a specimen for identification. The insect proved to be a male gipsy moth. It was captured by a local collector, Mr. Spadi, who is a student of Professor Tietz's. The area where the insect was found is in an outlying mountainous district. Immediately upon ascertaining the seriousness of the infestation, four employees of this project were transferred to this area in an attempt to determine the limits of the infestation. This work is not yet completed, but the information now at hand indicates that the

infestation extends about 8 miles long and 4 miles wide with the probable center of the infestation near Inkerman, a suburb of Pittston. No doubt, a much larger area will be found to be infested when the survey is completed. The extent of the infestation now indicates that the gipsy moth has been present in this region for a long period of time.

There has been very little shipment of plants or trees from there as the nurseries in this region are small and evidently do mostly a local business. This is one bright aspect of the situation for otherwise the insect might have been spread long distances.

A conference was held August 3 at the office of Hon. John A. McSparran, Secretary of Agriculture, at Harrisburg, Pa., to consider the situation. It was attended by Messrs. Strong, Hoyt, and Burgess; W. S. Hagar, Deputy Secretary of Agriculture; R. H. Bell, Director, State Bureau of Plant Industry; G. H. Wirt, Chief, Bureau of Protection, Department of Forests and Waters; H. B. Rowland, Assistant Chief, Bureau of Protection, and T. L. Guyton, Chief Entomologist, State Bureau of Plant Industry, in addition to Secretary McSparran. All agreed that the insect should be completely eradicated so that the forest, nursery, and horticultural industries in Pennsylvania would not be in danger. Extermination measures will be undertaken cooperatively by the Federal Department of Agriculture, the Pennsylvania Department of Agriculture, and the State Department of Forests and Waters. The fact that the gipsy moth has been exterminated in New Jersey in an isolated area of more than 400 square miles indicates that the same results can be accomplished in Pennsylvania.

At Sandwich, Mass., there is a plantation of cultivated blueberries containing 2,600 plants. An unusual gipsy moth problem occurred there this summer in connection with marketing the crop. The cultivated blueberry is very much larger than the wild varieties and considerable stress is made of the attractiveness of the product. This depends upon the bloom or color of the berries. The cultivated plants bore considerable numbers of gipsy moth larvae, which were feeding on the foliage, but the owner did not desire to spray with arsenate of lead as he feared that some spray residue would be left on the berries, particularly on the flower ends. The removal of this spray residue by washing would, of course, spoil the bloom and decrease their market value. The owner resorted to hand picking. It was necessary to go over the entire plantation three times, which involved twenty 8-hour days, to remove the larvae from the plants. The work was quite slow, particularly when the larvae were in their early stages.

For the first time in recent years, nursery stock offered for shipment was found to be infested with the gipsy moth, when two larvae were removed and destroyed. The quarantine inspector in the area required the owner to spray the nursery with arsenate of lead. This was done and the entire nursery has now been thoroughly sprayed.

During July, when shipments of quarantined products are not extensive, the quarantine inspectors in conjunction with their other work have been making collections of different stages of the gipsy moth, brown-tail moth, and satin

moth for the gipsy moth laboratory at Melrose Highlands, Mass. Campers' posters described in previous News Letters have been put up by them at suitable locations over the entire gipsy-moth area where they are most likely to be seen by the touring public. Tourist camps have been examined by the inspectors and in the section south of Boston, Mass., some of these camps were found to be heavily infested and considerable defoliation was present in the immediate vicinity. These camps present a difficult problem because freeing them and the immediate surroundings of infestation costs more than most of the owners can afford. At one of these camps, a touring party from St. Petersburg, Fla., had some gipsy moth larvae on their equipment. These tourists expect to remain at that camp for some time. Inspection of their entire outfit will be made to make certain that it is free from infestation before they move southward.

In addition to the materials the shipment of which is regulated by Quarantine No. 45, there are many others which, under certain conditions, are liable to become infested and their inspection is therefore necessary. The quarantine inspectors are continually on the watch for such shipments and numerous instances are recorded each year when inspections are made of materials not usually associated with the quarantine requirements. To this class may be assigned the equipment and outfits owned by construction concerns. If such outfits are brought into the quarantined area after the termination of the gipsy moth egg laying season, and removed before hatching commences, there is no danger that they will become infested. Many times, however, such equipment may remain through the larval season, and where operating in the vicinity of infested trees, have a very good chance of having egg clusters deposited on them. The inspectors in whose districts such outfits are operating arrange with the owners to inspect the equipment prior to moving, and numerous inspections of this type are made each year.

The quarantine regulations require that quarry owners and owners of other property, where stone or quarry products are obtained, clean up infestations and remove brush and tree growth from the immediate vicinity of the operating points. This work is possible at permanently established manufacturing sites. During slack seasons at the quarries, men employed there, particularly cutters of paving blocks, often purchase boulders lying around the woods and cut these into paving blocks which are sold to larger operators when there is a market for them. Usually these isolated cuttings consist of only a comparatively small number of paving blocks and it is not unusual to have them remain in the woods for years before being sold and shipped. As it is impossible to compel the owners of such small lots to comply with the clean-up requirements, it is very necessary that these lots receive inspection before being shipped. Because of the general business conditions, many of the paving cutters in southern New Hampshire have been occupying themselves with cutting small lots of blocks, and it is anticipated that more inspection of this type will be necessary as soon as markets develop.

It is necessary at all times for the district inspectors to be alert for unusual developments which may serve as avenues of spread for dangerous insects.

The spread of the satin moth to uninfested sections of the country is not associated with the shipment of stone and quarry products. There is a possibility, however, under some circumstances, that the insect may be spread in this way. Recently a granite cutting concern operated at night to fill an immediate order, and the flood lights used to permit night work attracted swarms of satin moth adults from neighboring poplar trees. The egg clusters of these insects were deposited in numbers on the working shed and materials lying about. It became necessary to inspect the stone very closely in order to prevent egg clusters being sent out with the shipment.

