USDA Animal and Plant Health Inspection Service
U.S. DEPARTMENT OF AGRICULTURE

Japanese Beetle Program Manual

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When using pesticides, read and follow all label instructions.

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Introduction

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Purpose

APHIS Plant Protection and Quarantine (PPQ) safeguards agriculture and natural resources from the risks associated with the entry, establishment, or spread of animal and plant pests and noxious weeds. Japanese beetle (JB) (*Popillia japonica*) is one such pest capable, if **not** controlled, of causing economic damage to U.S. agriculture and natural resources.

The primary objective of the JB Program is to protect the agriculture and natural resources of the Western United States by preventing the human-assisted spread of the JB from the Eastern United States on aircraft. This manual will help APHIS-PPQ personnel, State and county cooperators by outlining the policies and procedures necessary to protect the Western States from the accidental transportation of JB on aircraft.

Protected States

Nine Western States requested protection from JB infestation. These States are known as the "protected States." They are:

- Arizona
- California
- Colorado
- Idaho
- Montana
- Nevada
- Oregon
- Utah
- Washington

Japanese Beetle Program Manual Tasks

Specifically, this manual will address the following tasks:

- Determining the risk at JB-infested airports
- Issuing and canceling Emergency Action Notifications (EANs)
- Monitoring airports in JB-**free** areas
- Monitoring airports in protected States
- Treating aircraft and cargo
- Treating grounds
- Using compliance agreements (CAs)

This manual is to be used with other manuals, directives, and the Code of Federal Regulations (CFR) (7 CFR 301.48).

U.S. Domestic Japanese Beetle Harmonization Plan

The National Plant Board adopted the U.S. Domestic Japanese Beetle Harmonization Plan on August 19, 1998 (most recent revision June 20, 2016). This plan establishes procedures for the free movement of JB host commodities, such as nursery stock. The plan is periodically revised to incorporate new technologies and new procedures.

For more information on the plan, visit the U.S. Domestic Japanese Beetle Harmonization Plan website.

Users

The primary users of this manual may include the following:

- APHIS-PPQ field personnel who are:
  - Cooperating under Compliance Agreements (CAs)
  - Monitoring airports
  - Supervising PPQ officers
- State and county personnel who are:
  - Cooperating under CAs
  - Monitoring airports
- Airport personnel who are:
  - Applying pesticides
  - Cooperating under CAs
  - Monitoring airports

Related Documents

The following documents may supplement this manual:

- The Code of Federal Regulations: Information on JB is contained in 7 CFR 301.48
- Plant Protection Act (PPA)—the Plant Protection Act of June 20, 2000, which modernized and streamlined the plant quarantine laws and replaced the previous legislation. Information is in 7 USC 7701-36, with sections 14, 15, 23, 24, and 31 addressing specific issues
- U. S. Domestic Japanese Beetle Harmonization Plan—the National Plant Board working with USDA-APHIS-PPQ and the American Nursery and Landscape Association developed the U.S. Domestic Japanese Beetle Harmonization Plan. This plan establishes procedures for the free movement of JB host commodities.
- *Treatment Manual* published by USDA-APHIS-PPQ, contains accepted treatments for various commodities including aircraft (T409)

For more information on the biology, control, and prevention of this destructive plant, visit the APHIS Japanese Beetle website.

Advisories

Advisories are used throughout the *Japanese Beetle Program Manual* to bring important information to your attention. Please carefully review each advisory. The definitions coincide with American National Standards Institute (ANSI)[1] and are in the format shown below.

⚠ CAUTION
CAUTION is used to indicate tasks involving minor-to-moderate risk of injury.

[1] TCIF Guideline, Advisories *(Safety-Related Warning Message)*, TCIF-99-021 Issue 1, p.4.

⚠ DANGER

DANGER is used to indicate the event of imminent risk of death or serious injury.

NOTICE

NOTICE is used to alert a reader of important information or Agency policy.

SAFETY

SAFETY is used for general instructions or reminders related to safety.

⚠ WARNING

WARNING is used to indicate the event of possible risk of serious injury.

Japanese Beetle Program Manual Contacts

Information Services and Manuals Unit (ISMU)

The PPQ Information Services and Manuals Unit (ISMU) issues and maintains manuals electronically on the Plant Health Domestic Program and Emergency Response Manuals webpage.

If you are unable to access the *Japanese Beetle Program Manual* online or have a suggested edit (layout, spelling, etc.) please contact ISMU by email at PPQ.IRM.ISMU.Manuals.Feedback@usda.gov.

Revisions to the manual are announced via the APHIS Stakeholder Registry to government employees and external stakeholders who have subscribed to receive *Japanese Beetle Program Manual* updates. To subscribe, navigate to the APHIS Stakeholder Registry, enter your email address, and select the relevant manuals under Plant Health Information - Manual Updates.

Japanese Beetle Program Manual Liaison

If you disagree with a policy or procedure or have a situation that requires an interpretation or application of existing policy, you can contact the PPQ National Policy Manager Melinda Sullivan at melinda.j.sullivan@usda.gov.

Chapter

2

General Information

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Economic Importance

The Japanese beetle (JB) is a highly destructive plant pest that causes extensive damage to more than 300 different agricultural and ornamental plants. The larvae (grubs) feed on grass roots and damage lawns, golf courses, and pastures. Adult JB prefer foliage, flowers, and fruits. Population size varies considerably and may be sporadic from year to year due to weather conditions and other factors. Once established, JB infestations can be costly to control with insecticides or biological methods.

APHIS cooperated with State and county officials to develop regulations and guidelines to control the artificial spread of JB from infested Eastern States to the protected Western States. The cooperative Federal and State regulatory programs have been operating for many years.

First Detection

The JB was first found in the United States in 1916 near Riverton, New Jersey. In 1918, the USDA and New Jersey authorities attempted to exterminate the pest. However, they were **not** able to eradicate the pest because the infestation was well established, their control measures were marginally effective, and **only** limited funding was available.

Since then, JB has spread throughout most of the States east of the Mississippi River. Because of the possibility of artificial spread by aircraft, it is a major threat to the agriculture and flora of the Western United States.

Distribution

East of the Mississippi River

At present, JB occurs throughout most of the United States east of the Mississippi River. For the current distribution, refer to the APHIS JB Distribution Map.

West of the Mississippi River

Many States west of the Mississippi River **do not** have JB populations. Several States immediately west of the Mississippi River are generally infested (Arkansas, Iowa, and Missouri) and some are **only** partially infested (Kansas, Minnesota, Nebraska, Oklahoma, South Dakota, and Texas).

The Program's goal is to eradicate JB infestations in protected and uninfested States. Those States that are **unable** to eradicate JB, typically use integrated pest management (IPM) techniques to keep populations below economically damaging levels.

Distribution in Canada

Areas regulated for JB in Canada include:

- Southwestern portion of Quebec Province south of Montreal
- Southeastern Ontario Province along the shores of the St. Lawrence River
- Southwestern Ontario Province in the area bounded by Lake Huron, Lake St. Clair, and Lake Erie. This area includes the western shore of Lake Ontario.

A complete listing of infested regional municipalities and a map are located at the Canadian Food Inspection Agency (CFIA) website.

Distribution in Asia

Although native to Japan, JB is also found in parts of Russia.

Hosts and Nonhosts

Larvae feed on the roots and underground stems of plants, particularly grasses.

Adult Japanese beetles (JBs) are gregarious general feeders on leaves, flowers, and fruits. Preferred hosts include small fruits, tree fruits, garden crops, ornamental shrubs, vines, and trees. Studies indicate adult JB feed on **over** 300 species of plants representing 79 families.

Preferred Hosts

Table 2-1 Preferred Japanese Beetle Hosts

Scientific Name:	Common Name:
Abutilon x *hybridum*	Chinese-lantern
Acacia baileyana	Cootamundra wattle
Acer palmatum	Japanese maple
Acer platanoides	Norway maple
Aesculus hippocastanum	Horse chestnut
Alcea rosea	Hollyhock
Althaea spp.	Althaea
Arbutus unedo	Strawberry tree
Bauhinia variegata	Orchid tree
Betula populifolia	Gray birch
Castanea dentata	American chestnut
Ceanothus griseus	Carmel ceanothus
Citrus x *aurantium*	Orange
Cydonia oblonga	Common quince
Eucalyptus sideroxylon	Red ironbark
Fremontodendron californicum	Common flannel bush
Glycine max	Soybean
Grewia caffra	Lavender starflower
Hibiscus syriacus	Rose-of-sharon
Juglans nigra	Black walnut
Lagerstroemia indica	Common crape myrtle
Larix occidentalis	Western larch
Malus domestica	Apple
Nandina domestica	Heavenly bamboo
Parthenocissus quinquefolia	Virginia creeper
Platanus acerifolia	London planetree
Podocarpus macrophyllus	Yew pine
Polygonum spp.	Smartweed
Populus nigra	Italian poplar

Scientific Name:	Common Name:
Prunus spp.	Cherry
P. domestica	Plum
P. persica	Peach
Punica granatum	Flowering pomegranate
Quercus palustris	Pin oak
Rosa spp.	Rose
Rubus spp.	Raspberry
Sassafras albidum	Sassafras
Sorbus americana	American mountain-ash
Tilia spp.	Linden
Ulmus americana	American elm
Ulmus minor	English elm
Vitis spp.	Grape
Zea mays[1]	Maize
Zinnia elegans	Zinnia

Nonpreferred Hosts and Nonhosts

Although adult beetles feed on **over** 300 species of plants, they feed sparingly or **not** at all on many cultivated plants. Some plants are rarely or never fed on such as evergreens, common grains, most truck and field crops, and many of the common ornamental flowers.

When beetles are abundant, plant damage may be avoided by using species that are immune or seldom attacked by the insect.[2]

Table 2-2 Nonpreferred Hosts and Nonhosts for Japanese Beetle

Plant Group:	Specific Plants:
Small fruits	American cranberry, black huckleberry, European gooseberry, northern dewberry, northern gooseberry
Orchard fruits	pear, persimmon
Truck and garden crops	artichoke, brussels sprouts, cabbage, cantaloupe, cauliflower, celery, onion, cucumber, eggplant, endive, carrot, pea, radish, kale, leek, lettuce, muskmelon, parsley, parsnip, peanut, potato, pumpkin, red pepper, rutabaga, salsify, spinach, summer squash, sweet potato, tomato, turnip, watermelon
Field crops	Barley, buckwheat, hops, millet, oats, rye, timothy, tobacco, vetch, wheat

[1] The adults seriously injure corn by eating the silk, which interferes with pollination and kernel formation.
[2] Fleming, W.E. (1976) USDA Agricultural Research Service Technical Bulletin No. 1545).

Plant Group:	Specific Plants:
Ornamental herbs	Adam's needle yucca, ageratum, American columbine, American germander, American pennyroyal, American water lily, American wormseed, anise, baby's breath, balsam, bearded iris, begonia, blue flax-indigo, brown-eyed Susan, butterfly violet, caladium, carnation, catnip, Chile avens, Chinese lantern-lant, Christmas-rose, chufa, cockscomb, bamboo, cosmos, coneflower, coralbells, cornflower, dogtooth violet, dusty-miller, Easter lily, European columbine, evergreen candytuft, false-dragonhead, fern, flowering tobacco, forget-me-not, foxglove, fringed iris, gaillardia, goldenglow, ground-myrtle, gysophila, hardy larkspur, hyssop, Iceland poppy, Japanese iris, Japanese spurge, lance coreopsis, lily, lily-of-the-valley, mignonette, mountain-bluet, motherwort, mullein, nasturtium, New England aster, oriental poppy, oswego-tea, oxeye daisy, Pacific bleeding heart, pampas grass, pansy, perennial pea, petunia, phlox, portulaca, purple loosestrife, pyrethrum, sedum, skydrop aster, small white aster, snapdragon, southern maidenhair, spearmint, speedwell, spiderwort, strawflower, sweetpea, sweet scabious, sweet violet, sweet-William, tawny daylily, tiger lily, verbena, Virginia dayflower, wave aster, white-top, white turtlehead, wild bergamot
Ornamental shrubs and vines	American bittersweet, American bladdernut, American elder, American holly, azalea, beautyberry, border forsythia, Canada yew, Carolina allspice, Catawba rhododendron, Chinese azalea, Chinese holly, Chinese redbud, climbing euonymus, climbing hydrangea, coralberry, English holly, English ivy, European cranberry bush, firethorn, gardenia, groundsel-bush, Japanese holly, Japanese honeysuckle, lantana, lilac, matrimony vine, mock orange, mountain-laurel, panicle hydrangea, Persian lilac, pinxter bloom, privet, rosebay rhododendron, smooth hydrangea, snowberry, swamp azalea, sweet autumn clematis, torch azalea, tube clematis, weeping forsythia, winged euonymus, winterberry, winter honeysuckle, witch hazel
Trees	ailanthus, American arborvitae, American hazelnut, American sweetgum, Atlantic whitecedar, balsam fir, black locust, block oak, Bolleana poplar, boxelder, butternut, Canada yew, Chinese juniper, common juniper, common smoke tree, cryptomeria, Douglas fir, English yew, flowering dogwood, hemlock, Hinoki-cypress, Japanese pagodatree, Japanese yew, laurel magnolia, Lawson white cedar, maidenhair tree, mimosa, northern red oak, Norway spruce, oriental arborvitae, post oak, red ash, red maple, red mulberry, saucer magnolia, Sawara-cypress, scarlet oak, Scotch pine, shagbark hickory, silver maple, southern magnolia, southern red oak, tuliptree, Virginia pine, western yew, white ash, white oak, white poplar

Life Cycle

There is usually one generation of JB each year, but a percentage of the grubs may take 2 years to mature, especially in wet, cold soils. A diagram of a typical life cycle is shown in Figure 2-1. However, temperature and moisture influence the development of life stages. As a result, life stage development will vary from year to year at a given locality. Additionally, geography and latitude within a particular State can significantly impact the beetle's life cycle.

Egg Stage

Female JB burrows into the soil to a depth of about 3 inches to lay eggs. The eggs are deposited singly and **only** a few are laid at a time. Egg laying is intermittent, and a female usually deposits 40 to 60 eggs during its lifetime.

Larval Stage

The eggs hatch in approximately 2 weeks and the larvae (grubs) begin feeding on the roots of grass and other plants. During the summer, the grubs feed within the upper 4 inches of soil. However, during late fall, they work downward in the soil to a depth of 8 to 10 inches to overwinter. In the spring, the grubs move upward and resume feeding on grass roots.

The full-grown larvae are about 1 inch long and usually lie in the soil in a curled position. Refer to Figure 2-1 to view an example of a larva.

Figure 2-1 Japanese Beetle Larva[3]

Description of First, Second, and Third Instar Larvae

A micrometer eyepiece can be used to measure the length of the instar and the width of the head capsule; the measurements in Table 2-3 serve as a guide for identifying the different larval stages.

Table 2-3 Size of First, Second, and Third Larval Instars

Measurement:	First instar:	Second instar:	Third instar:
Length of instar	10.5mm	18.5mm	32mm
Width of head	1.2mm	1.9mm	3.1mm

Table 2-4 Description of Third Instar Larvae

Description:	Characteristics:
Form	C-shaped
Surface of head	• Epicranial arm is **not** conspicuous • Epicranial stem is a fine, dark, impressed line • Front with a short, vague, longitudinal, median impression in apical third; at each side of this is a row of five punctures diverging toward the middle bend of the epicranial arm • Smooth, shining

[3] Photo courtesy of the USDA–Agricultural Research Service, Bugwood.org.

Description:	Characteristics:
Color of head	Pale, dull yellow
Raster	• Medially, two conspicuous, divergent rows of shorter, straight spines in V-form • Numerous coarse, rather long, scattered, brown, hooked spines • Numerous rather long, yellowish hairs located at the sides and end of the tenth segment • Six or seven spines in each row
Anal slit	Transverse, arcuate
Vestiture	• Entire grub with rather long, scattered brown hairs • Dorsal convexities of first six abdominal segments clothed with fine, short, brown spines
Habitat	In soil, primarily under turf

The distinct V-like arrangement in two rows of short dark spines of the underside of the raster is sufficient to distinguish the JB from other soil-dwelling scarab beetles.

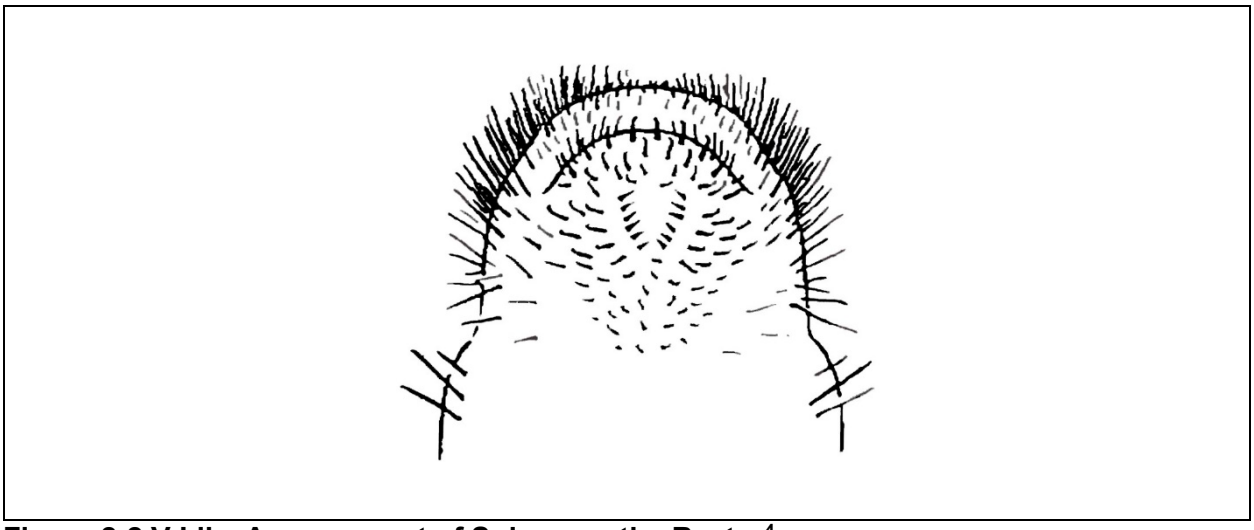


Figure 2-2 V-Like Arrangement of Spines on the Raster[4]

Pupal Stage

When full grown, the grubs move slightly deeper in the soil and form an earthen cell to pupate. A prepupal stage is followed by a pupal stage that lasts 7 to 17 days. The grubs enter the pupal stage about 2 weeks before adult emergence.

Adult Stage

Newly emerged adults may remain in the pupal cell for 2 to 14 days before emerging from the soil. During the warm summer months, adult JB live above the ground.

The onset of adult emergence is primarily influenced by soil temperature. In the Southern United States, adult JB can emerge in May and in New England, emergence can begin in July. In Eastern North Carolina, JB begin to emerge from the soil in mid-May, while further north in Philadelphia, Pennsylvania, adult JB emerge during June. Typically, peak adult JB activity occurs 4 to 6 weeks after the first adult beetles emerge. Refer to the Spatial Analytic Framework for

[4] Illustration courtesy of University of Massachusetts Amherst, Center for Agriculture, Food, and the Environment.

Advanced Risk Information Systems (SAFARIS) website for accurate and real-time phenology degree-day maps of adult JB emergence.

Beetles fly **only** during the day and are especially active on warm, sunny, calm days. Often gregarious, they feed mostly on the upper surfaces of leaves exposed to the sun. When feeding on the leaves, the beetles chew out the parts between the veins giving the leaves a "lace like" or "skeletonized" appearance.

Refer to Figure 2-3 for a diagram of the life cycle.

Figure 2-3 Diagram of the Japanese Beetle Life Cycle[5]

Description of Adults

Adult JB are 10 to 12 millimeters (mm) long; their color is shiny metallic green with coppery-brown elytra (wings). The beetles can readily be recognized by the presence of 6 small patches of white along each side and the back of the abdomen just under the edges of the elytra. Refer to Figure 2-4 for a picture of an adult JB.

Figure 2-4 Single Adult Japanese Beetle[6]

[5] Illustration courtesy of the USDA–Animal and Plant Health Inspection Service (APHIS). Illustrated by APHIS employee Joel Floyd.
[6] Photo courtesy of the USDA–Animal and Plant Health Inspection Service (APHIS).

Characteristics of Male and Female Adults

A hand lens is helpful when determining the gender of beetles in the field; with practice, this can be done with the unaided eye.

The gender of adults can easily be determined by the shape of the foretibia and tarsi. For males, the apical tibial spur terminates in a sharp point; for females, the apical tibial spur is elongated and more rounded. In males, it is shorter and stouter, with the first segment about as long as wide; for females, the tarsi are somewhat longer and slenderer, with the first segment elongated and about equal in length to the next two or three segments combined. For males, the tarsus inserts near the apex of the tibia, while insertion of the tarsus is closer to the midpoint of the tibia in females.

Table 2-5 Characteristics of Male and Female Adult Japanese Beetles

Males:	Females:
Foretarsus shorter and stouter	Foretarsus longer and more slender
Insertion of foretarsus close to apex of tibia	Insertion of foretarsus closer to midpoint of tibia
First tarsal segment about as long as wide	First tarsal segment two to three times as long as wide
Apical spur of foretibia short and pointed	Apical spur of foretibia elongated and rounded

The photograph in Figure 2-5 illustrates the differences between male and female adults.

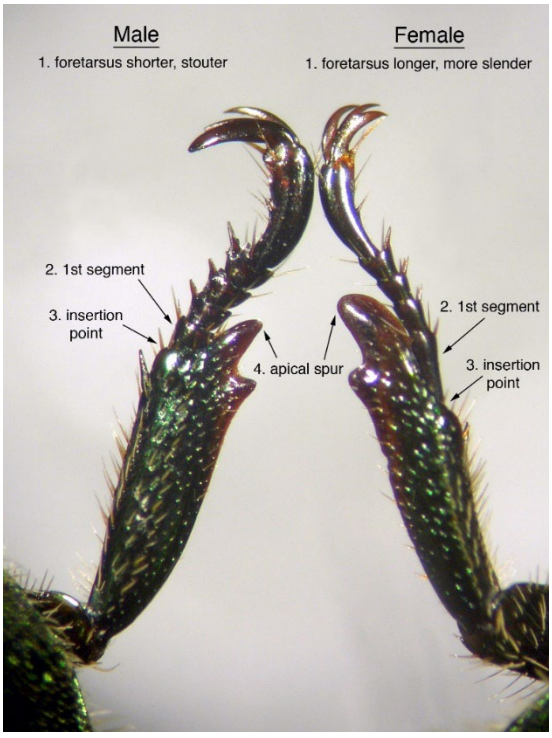


Figure 2-5 Photograph Showing the Foretibia of Males and Females with Distinctive Differences[7]

[7] Photo courtesy of Bruce Gill, Centre for Plant Quarantine Pests, Canadian Food Inspection Agency (CFIA), Ottawa, Canada.

Chapter

3

Airport Monitoring and Classification

Contents

Goal of Airport Monitoring

The goal of airport monitoring is to estimate the level of risk and likelihood that Japanese beetle (JB) will enter aircraft by evaluating three factors:

- The extent of JB activity (i.e., flying adults) near aircraft operating areas
- The size of the JB population at the airport
- The risk of JB entry into aircraft and transport to JB-free areas

Remember that aircraft operating areas include passenger boarding, luggage handling, and cargo loading areas.

These factors assessed together by agriculture officials represent the probable risk of JB transportation on aircraft to the protected States from the airport. The officials use the factors to determine the classification of the entire or a section of the airport as regulated or unregulated. The classification then dictates the type of safeguards and treatments required for airport operations.

Helpful Tools

The APHIS Japanese Beetle website can serve as a helpful tool for personnel involved in monitoring JB populations at infested airports in the East and **non**infested airports in the "protected States."

Goal of Airport Classification

The goal of airport classification is to classify airports in the JB-infested area into either a regulated or nonregulated status. This classification into regulated and nonregulated airports is

based on the threat the individual airports pose to the **JB-free** areas. In the **JB-free** area, nine Western States have protected status, they are Arizona, California, Colorado, Idaho, Montana, Nevada, Oregon, Utah, and Washington.

Regulated airports in the JB-infested areas under quarantine should be those airports where the beetle is likely to enter aircraft and be transported to **JB-free** areas. APHIS will issue an Emergency Action Notification (EAN) to inform airport personnel when the airport is to be regulated. APHIS inspectors can cancel an EAN to return a regulated airport to nonregulated status.

Nonregulated airports in the JB-infested areas under quarantine should be those airports where the beetle is **not** likely to enter aircraft and be transported to **JB-free** areas.

Airport Monitoring in Infested Areas

In JB-infested areas, under the direction of the State Plant Health Director (SPHD), authorized inspectors (either PPQ officers or designees) will survey JB populations to determine the potential risk at each airport using one or more of the following methods:

Trapping Adult Beetles

Trapping adults is a valuable monitoring method that provides a population estimate at the time when the risk of live adult transport on aircraft is most likely. Within a single season, these captures can determine when adult emergence begins, peaks, and ends; and if performed over several seasons, trapping may indicate population trends within the airport.

Number of Traps

To monitor adult JB emergence at infested airports with flights to **JB-free** areas, place 4 to 8 traps per airport. Upon first JB capture, remove all traps and place **at least** 1 mile from the airport environs so as **not** to attract beetles to the airport operating area.

Trap Types

Dual-lure traps, containing both food and pheromone lures, are most effective in attracting adults. The trap and lure procurement database can be used to request traps and lures. Contact your regional trap and lure program manager for details.

If **only** a food-type lure is used, it should be “PEG,” which is a combination of phenyl ethyl propionate, eugenol, and geraniol in a ratio of 3:7:3. Using the food-type lure alone is **not** recommended.

Commercially prepared, sustained-release dispensers are available to disperse the pheromone lure for 75 to 100 days. Neither trap color nor size is a factor in trapping adults. Traps are usually yellow; however, white and green traps are equally effective and should be used to reduce the impact on pollinators.

Trap Placement

Trap placement is critical. Place traps to meet the following criteria:

- All-day sun (or at least midday sun)—traps placed in direct sunlight are twice as effective as those placed in the shade.
- Near, but **not** adjacent to, host plants. Trap placement should be 3 to 7 yards from favored trees, shrubs, and vines. **Do not** place traps immediately adjacent to tall, bushy plants or other objects that could interfere with dissemination of the lure. Refer to Table 2-1 for a list of common names of host plants.
- Place traps so the bottom is approximately 22 inches above ground level. Traps baited with a pheromone attractant and PEG were most effective when placed at this height.

NOTICE

When placing traps, **never** put traps closer than 1 mile to aircraft-operating areas. Above all, **never** put traps **only** near aircraft-operating areas. Traps near aircraft-operating areas will **only** attract beetles into the aircraft-operating areas, creating entry problems where none existed.

Trap Examination

At a minimum, examine traps three times per week during JB flight period to ensure they are operative, as well as to remove **all** contents and clean the trap. Save suspected JB for identification and discard **all** other insects. **Never** reuse traps without inspecting for the presence of dead or live beetles. In areas of high JB populations, traps may need to be inspected more often, daily if necessary.

NOTICE

If the airport is in a State involved in invasive species surveys, consider examining the traps for nontarget exotic species. If an airport receives flights from around the world, an additional examination for exotic species may be a valuable part of an exotic species detection program.

At the end of the monitoring (or control) season, store traps in a dry location. They may be stored either assembled or disassembled. Thoroughly clean traps before storage.

Trap Removal

Remove traps following the first detection when a high-risk situation exists according to the three risk criteria:

- JB adults observed flying near aircraft-operating area
- High JB population
- The potential for transport to **JB-free** area in the west

When a low-risk situation exists at an airport (beetles are **not** likely to enter aircraft in an aircraft-operating area), traps can remain in place throughout the monitoring period. In this situation, traps can be checked less frequently depending on the weather.

Larval Surveys

Larval surveys are most often conducted to determine the most common life stage and the population level. They may be used alone or in combination with traps. As such, they are an

invaluable tool used to determine whether pesticide applications or biological controls are necessary.

When to Conduct Larval Surveys

Surveys should be conducted in the spring before adult emergence and in the fall following the JB flight season. Furthermore, if turf damage indicates many larvae in the soil, conduct a survey.

During the spring and fall, larvae consume the fibrous roots of the turf. This gives it a soft, spongy surface that can be readily observed by a trained inspector. Severely damaged turf caused by the damage from larvae, as well as bird and animal feeding, can usually be rolled back like a rug. Because other scarab larvae produce similar damage as JB, identification of the responsible larvae is crucial.

Sampling Protocol

To estimate JB population density and determine potential treatment methods, identification **must** be swift and accurate. Refer to Table 3-1 for a sequential sampling plan. The required number of samples is determined by the cumulative total from the initial samples.

The sequential sampling plan in Table 3-1 is for second instar populations **only**. In New England, researchers determined that JB populations will be almost completely second instar by the end of August (about 1 month after the midpoint of the adult flight period; adjust timing for your location as necessary).

Each sample consists of 1 square foot of turf collected and examined for larvae to a depth of 4 to 5 inches. The time required to examine one sample is brief, around 15 minutes.

Control of the second instars is recommended when the average larval count is **greater than three per square foot**. When the count is **less than** one per square foot, control is **not** required. If **only** one larva is observed, additional sampling should be conducted.

Using Table 3-1, discontinue sampling when the cumulative number of larvae falls within the category of "Treatment **NOT** required" using the 5% error rate column, if possible.

Table 3-1 Sequential Sampling Table for Treatment Decisions on Second Instars in Turfgrass by Cumulative Number of Larvae

Number of Samples	10% error rate Treatment NOT required	10% error rate Treatment required	5% error rate Treatment NOT required	5% error rate Treatment required
1	*	6	*	7
2	*	8	1	9
3	1	9	*	11
4	3	11	1	13
5	4	13	3	14
6	6	15	5	16
7	8	16	6	18
8	10	18	8	20
9	11	20	10	21
10	13	22	12	23

Number of Samples	10% error rate Treatment NOT required	10% error rate Treatment required	5% error rate Treatment NOT required	5% error rate Treatment required
11	15	23	13	25
12	16	25	15	26
13	18	27	17	28
14	20	29	18	30
15	22	30	20	32
16	23	32	22	33
17	25	34	24	35
18	27	35	25	37
19	29	37	27	39
20	30	39	29	40

*Decision **cannot** be reached

Adult Visual Surveys

Adult visual surveys are commonly used to determine the level of the beetle population in aircraft-operating areas. A minimal level of monitoring requires visual surveys of aircraft-operating areas in airports that were **regulated in any of the last 3 years**.

To coordinate visual surveys with the most optimum periods, use traps to detect the onset and peak of emergence. As an alternative, use surveys of various preferred hosts.

Peak Emergence Period

Adult beetles begin to emerge in May in southern localities, later in northern localities. Peak adult activity occurs 4 to 6 weeks after emergence starts. For an accurate near real-time prediction of adult emergence, refer to Spatial Analytic Framework for Advanced Risk Information Systems (SAFARIS) to find and print phenology maps for your State.

Frequency of Visual Surveys

During the peak emergence period, perform visual surveys three to five times weekly, depending on the weather.

Duration of the Survey

Each visual survey at an aircraft-operating area should last **at least** 15 minutes and be conducted under conditions favorable for beetle activity. If high numbers of adults are flying near aircraft, longer and more frequent surveys may be necessary.

Time, Humidity, and Temperature

Adults fly **only** in the daytime. Critical times to observe beetles associated with aircraft are daylight hours on warm, sunny, and calm days. Typically, peak beetle activity and captures occur between 1:00 p.m. and 2:00 p.m., when air temperatures are at their highest. Trapping has shown that 45% of beetle activity occurs between 10:00 a.m. and 1:00 p.m. Although captures were spread out over most of the afternoon, the greatest number of captures occurred between 1:00

p.m. and 2:00 p.m. Fewer than 5% of the beetles were captured after 5:00 p.m. or before 9:00 a.m.

Beetles typically fly on clear days when the temperature reaches about 70 °F and relative humidity is below 60%. Often, but **not** always, temperatures above 95 °F or relative humidity above 60% stop or reduce flights of the adults. In Louisville, KY, flights did occur when the temperature was near 100 °F and the relative humidity was 70%. When Japonilure (an attractant placed in traps) was used alone, about 70% of the captures occurred between 10:00 a.m. and 1:00 p.m. and peak capture was at noon.

Rain and the Visual Survey

If possible, conduct visual surveys the day after a rainstorm, because adult emergence typically increases following a rain event.

Detections on Aircraft

Airport monitoring using traps, larval surveys, and/or visual surveys may **not** detect a high-risk situation. A single interception at an airport in a **JB-free** area may potentially indicate a high-risk situation at the originating airport.

Therefore, when beetles are found on aircraft in the **JB-infested area** and those aircraft are scheduled to go to **JB-free areas**, a high-risk situation likely exists. That is why it is essential that the State Plant Regulatory Official (SPRO) complete a Japanese Beetle Aircraft Inspection Record (JBAIR) (refer to Figure A-5) and inform the National Operations Manager (NOM). Next, the NOM will immediately inform the SPHD of the originating State and possibly airport personnel.

Reports from Infested and Partially Infested Areas

Enter information from JB partially infested States into the National Agricultural Pest Information System (NAPIS).

When monitoring information indicates a threatening condition, weekly reports are necessary. Even if a threatening condition is **not** present, bimonthly reports of emergence and population levels at infested airports are essential to aid protected States in developing more stringent inspection and mitigation measures.

Reporting Monitoring Information

In addition to weekly reports during the JB flight period (June-September), enter monitoring information using NAPIS.

Reports at the End of the Season

After traps are removed for the season, information on New State Records (NSR) and New County Records (NCR) will be entered into NAPIS.

NOTICE
At the first find of a beetle infestation in a county or State, enter an NCR or an NSR into NAPIS.

Determining Risk at Infested Airports

Determine the Risk at a JB-Infested Airport Using Three Criteria

- Population size
- Proximity to aircraft operating areas
- Aircraft-associated detections in protected States

JB population size

Evaluate if the beetle population is at a high-risk level. Is the population high enough to place aircraft or cargo at risk at the airport being evaluated? High-risk aircraft are those scheduled to fly to a protected State and may have been exposed or had cargo exposed to a JB infestation.

NOTICE

IMPORTANT POINT: The detection of beetles at **an origin airport**, or in the immediate vicinity, is **not** in itself sufficient reason to declare the airport under quarantine, nor does it mean it is now a high-risk regulated airport.

Three criteria **must** be met:

- The airport **must** be subject to regulation and beetles **must** be closely associated with aircraft that are loading, unloading, or parking during critical times (7:00 a.m. to 8:00 p.m.) throughout the JB flight period (June-September).
- The beetles **must** present a danger of gaining entry to the interior of the aircraft, either by direct flight or by hitchhiking on passengers' clothing or cargo.
- Flights **must** be destined to protected States.

If these criteria are met, the airport, or section of the airport, will be considered high risk. As such, the airport will receive a "regulated status" and be required to comply with 7 CFR 301.48 to safeguard protected Western States.

To ascertain the previously mentioned risk criteria at your airport, you will collect specific information related to each one of these risk factors, which will be discussed in more detail in the next section.

Operating areas

Consider the second criterion: are aircraft in aircraft-operating areas or cargo likely to become infested? Generally, JB population numbers alone are **not** sufficient to cause an airport (or portion of an airport) to be regulated. A JB population may be isolated from the aircraft-operating area. However, JB host plants and grassy areas growing close to either the airport, terminal, or hangers can increase risk.

NOTICE

A large JB population with a high probability of aircraft or cargo infestation according to the risk criteria will necessitate airport regulation.

Survey data should influence the decision-making process at each airport. If records indicate increasing JB population and the other risk criteria are met, a high-risk situation usually exists. However, each airport possesses unique factors and agriculture officials may have to make a judgment call. Light populations typically represent a lower risk. Regardless of beetle numbers,

entry into an aircraft is likely if adult JB fly near or rest on the aircraft's exterior surfaces, boarding ladders, or similar items. This situation should be considered **high risk**. If a 15-minute visual survey, conducted under optimal conditions around an aircraft-operating area finds two or more live adults, aircraft infestation is highly likely.

Detections in Protected States

Consider the third criterion: are infested aircraft arriving in protected States? A single beetle interception in any protected State (or in any **JB-free** area) indicates a potential high-risk situation at the originating airport or at a previous stopover airport(s); therefore, regulation at a high-risk infested airport should be considered. Refer to Monitoring and Managing Airports in Protected States for information on responding to a detection in protected States.

Determine Which Specific Areas, Carriers, Aircraft and Containers Are at Risk

Use the risk criteria in Determine the Risk at a JB-Infested Airport Using Three Criteria to determine the risk from various factors.

- Aircraft at high-risk times versus aircraft at low-risk times
- Carriers
- Containers stored outdoors
- Containers stored indoors
- Individual aircraft operating areas
- Other factors

Evaluate Mitigating Measures

If one or more high-risk factors have been identified, evaluate **all** mitigating measures that, either alone or in combination, would reduce each factor and the overall risk. Examples of mitigating measures include:

- Keeping **all** at-risk aircraft closed whenever possible
- Moving at-risk aircraft and cargo operations to a low-risk section of the airport
- Reducing JB populations in the airport and in surrounding areas
- Rescheduling aircraft loading and flight times to low-risk times
- Using excluders whenever an at-risk aircraft is opened

These examples and other mitigating measures are discussed in detail in Control Measures.

Prompt application of one or more mitigating measures may allow an airport to remain unregulated.

Complete an Emergency Action Notification (EAN), If Necessary

If an airport or a carrier needs to be regulated to prevent the beetles being transported to protected States, complete an EAN. Refer to Using the Emergency Action Notification (EAN) and Other Activities for more information on the EAN and other required activities.

- Aircraft scheduled to fly to a protected State; and
- Aircraft is either exposed to infestation by JB or is carrying cargo exposed to infestation

The detection of beetles at an origin airport or in the immediate vicinity is **not** in itself sufficient reason to declare the airport under quarantine, nor is treated as a high-risk regulated airport.

Using the Risk Criteria for Decision Making

The State Plant Health Director (SPHD) of the regulated State will review the situation at the airport using an evaluation based on the three criteria. Based on this review the SPHD can decide to regulate all or part of the airport.

Potential High-Risk Airports

High-risk aircraft departing during the peak JB daily flight period (June -September) and between 7:00 a.m. and 8:00 p.m. may require safeguarding and treatment. PPQ officers should collect the flight numbers and airlines of these aircraft for monitoring purposes.

NOTICE

High-risk aircraft include any aircraft with a destination anywhere in the protected States; even if the aircraft has intermediate stops in other airports along the way to the destination, it is still considered high risk. Obtain flight information from these aircraft during beetle emergence.

Using the Emergency Action Notification (EAN) and Other Activities

If aircraft going to protected States are likely to be infested, the JB National Operations Manager (NOM), the SPHD or a designee, may designate any airport within a quarantined State as a regulated airport. The high probability of JB-infested aircraft spreading the beetle to protected States justifies this regulation.

Issuing the EAN

After determining an airport is high risk and **must** be regulated, the SPHD (or a designee) will immediately complete and issue an EAN (PPQ Form 523, Emergency Action Notification) to the following individuals:

- Official in charge of the airport
- Officials in charge of the airlines sending aircraft during daylight hours to the protected States

The SPHD will provide a copy of the EAN to the JB Program NOM.

Regulated Airport Report

When an airport is regulated, the Program NOM will inform all interested parties by circulating a report like the one in Table 3-2 by email.

Table 3-2 Regulated Airport Report

Fields:	Data Entered:
Name of Airport	Text
Date and time regulated:	Date—00:00 hours
Date and time deregulated:	Date—00:00 hours

SPHDs responsible for regulated airports will inform their Associate Executive Director through the NOM of all actions taken. If additional actions are necessary, the SPHDs will notify the NOM.

High-Risk Flights

When an airport is regulated, the SPHD (or a designee) **must** obtain schedules listing **all** high-risk flights. The high-risk flights are usually those departing during daylight hours (between 7:00 a.m. and 8:00 p.m.) for protected States; however, high-risk flights may depart at other times. The SPHD (or a designee) will then provide these schedules to the JB Program NOM for distribution to APHIS personnel and State Plant Regulatory Officials (SPROs) in the protected States.

This feedback system of communication between the "protected States" and the "infested States" is necessary to coordinate safeguarding and treatment options as well as to track where flights originated.

Unscheduled Flights

For all unscheduled commercial and military flights, the SPHD of the originating airport will notify the personnel or SPRO at the destination airport **at least** 1 hour before departure. The SPHD at the originating airport may omit the one-hour notification requirement on a case-by-case basis.

Arranging Control Measures at Regulated Airports

To protect **JB-free** areas, the SPHD of the regulated airport **must** implement control measures such as:

- Electing to treat aircraft with an approved insecticide if unable to modify loading times and areas (this option is for large carriers)
- Loading aircraft in an area with less exposure to adult JB
- Removing or treating JB host plants
- Replacing landscaping with nonhost plants
- Rescheduling aircraft loading and departure times to the evening or night when JB activity is low
- Treating JB larvae with insecticides or using a biological control agent

Failure to Comply With an EAN

An airport or airline that does **not** comply with the requirements of an EAN may be issued a violation notice (PPQ Form 518) by a PPQ officer.

Military Cooperation

Authorization for military cooperation is contained in the Defense Transportation Regulations (DTRs):

- DTR 4500.9-R, Part II, Chapter 208 (Packaging and Handling)
- DTR Part V, Chapter 505 (Agricultural Cleaning and Inspection Requirements)

If a SPHD has any difficulty in obtaining cooperation, they will contact the Commanding Officer and reference the above provisions.

Revoking the EAN

When successful safeguards have been enacted that reduce the JB risk to aircraft, PPQ officers (or their designees) will inform the SPHD, who may then cancel the EAN and return the airport to nonregulated status. The SPHD will then complete Block 16 of the EAN, Action Taken. Copies of the updated EAN will be supplied to all affected airline and airport officials.

The SPHD responsible for the recently deregulated airport will inform the NOM of the EAN revocation. The NOM will notify the JB Program National Policy Manager (NPM) via email of the status change.

Reporting the Deregulation of an Airport

It is the NPM's responsibility to inform all program staff, as well as update and distribute the list of regulated and nonregulated airports via the Deregulation of an Airport Report (refer to Table 3-3 below). This report is published on the JB Program website and available to all affected stakeholders.

Table 3-3 Deregulation of an Airport Report

Fields:	Data Entered:
Name of Airport	Text
Date and time regulated:	Date—00:00 hours
Date and time deregulated:	Date—00:00 hours

Monitoring and Managing Airports in Protected States

To maintain a **JB-free** status, flights arriving in protected States, particularly those originating from regulated airports, are monitored through careful inspection of all interior parts of the aircraft and its cargo. **All** JB that are found, whether live or dead, **must** be recorded on the Japanese Beetle Aircraft Inspection Record (JBAIR) and communicated to the SPHD of both the receiving and originating airports.

Using the JBAIR

When inspecting flights from infested airports, the JBAIR is used to record data. The complete JBAIR will specify the total number, condition, and specific locations of beetles found on the infested aircraft. Refer to Japanese Beetle Aircraft Inspection Record (JBAIR) for an example of a JBAIR.

NOTICE

The JBAIR website requires ArcGIS credentials.

Reports will be available for PPQ, State, and industry personnel. The reports will enable PPQ, State, and industry personnel to evaluate:

- Effectiveness of exclusion procedures
- Effectiveness of pesticide treatments

Communicating with Infested States with the JBAIR

These JBAIRs, available to PPQ, State, and industry personnel, are an essential recordkeeping tool that evaluates the potential effectiveness of safeguarding and exclusion procedures, including treatments in the infested States. Therefore, it is essential when live JBs are found that **all** protected States **not only** complete the form, but also immediately contact the NOM and SPHD of the originating airport. Additionally, the JBAIR should be entered into the Integrated plant Health Information System (IPHIS) database so all impacted parties can access the information.

The Role of the SPRO of Protected States

When beetles are intercepted at an airport in protected States, and the origin of the aircraft is from an infested airport, the SPRO of the protected State is responsible for sending the JBAIR and immediately notifying the following individuals:

- NOM
- SPHD of the originating airport

The Role of the SPHD of the Originating Airport

Within 24 hours, the SPHD at the originating airport will determine if a high-risk situation exists by following the steps in the section Determining Risk at Infested Airports.

The SPHD responsible for the originating airport will immediately inform the NOM. The NOM will inform the SPRO responsible for the receiving airport of actions taken (monitoring results and/or mitigating measures implemented).

If the aircraft upon which the interception was made transited **two or more** airports within the JB-infested States and the origin of the beetle **cannot** be verified, the SPRO at the receiving airport **must** notify the SPHDs responsible for **all** the transited airports. The SPHDs responsible for the transited airports will follow the previously mentioned steps to determine which of the transited airports are high risk.

Response of Protected States to Live JB Finds

When live beetles are found in protected States, the SPRO (or a designee) responsible for the receiving airport may take one or more of the following safeguarding actions:

- Closing the infested aircraft and treating it or its cargo at a later destination
- Issuing a State equivalent of an EAN
- Monitoring unloading activities
- Terminating **all** unloading activities
- Treating the infested aircraft and/or cargo immediately

Generally, the SPRO responsible for the receiving airport (or a designee) will issue an EAN or Hold Notice and the aircraft will be treated.

Responding to Interceptions from Regulated Airports

Interceptions of dead or moribund beetles on aircraft from regulated airports are to be expected because of the pesticide treatments. Finding live beetles in aircraft from regulated airports and carriers is an indication that safeguarding procedures were **not** correctly followed or were **not**

completely effective. If such is the case, within 24 hours, the SPHD at the originating airport will determine the effectiveness of the safeguarding procedures by considering the following and similar questions:

- Are all mitigating procedures being used correctly?
- Are treatments being applied correctly?
- Are treatments effective when used correctly?
- How effective are the mitigating procedures being used?

After completing the determination, the SPHD responsible for the originating airport under quarantine or the regulated carrier will immediately inform the SPHD responsible for the receiving airport of the actions taken (determination results and mitigating measures implemented).

When live beetles are found, the SPRO responsible for the receiving airport (or a designee) may take all appropriate action to safeguard the receiving airport. For example, the SPRO may issue an EAN to treat or re-treat an aircraft or any of the actions described above.

Responsibilities of Protected States

Clear communication between infested States and protected States, along with regulatory controls and sharing data, is the key to preventing JB from spreading.

More specifically, to foster cooperation within the JB Program, a protected State is encouraged to:

- Maintain a parallel intrastate quarantine for the beetle, if applicable
- Participate in bimonthly conference calls during the JB season to receive and provide updates on Program activities
- Share their State's data on JB distribution based on current surveys

Responding to Interceptions from Unregulated Airports or Carriers

Interceptions of beetles on aircraft from unregulated airports or carriers is an indication that a high-risk situation probably exists and that regulation in the JB-infested area is necessary. If so, the SPRO of the receiving airport will issue an EAN or Hold Notice outlining the specific safeguarding or treatment actions required in accordance with 7 CFR 301.48.

Monitoring and Managing Airports in JB-FREE Areas Outside of Protected States

This section addresses monitoring protocols at airports outside of protected States. Trapping at these airports is optional and the methods used are based on the availability of resources. When a beetle is intercepted, the SPHD (or designee) or the SPRO (or by a cooperative decision) determines how they should be monitored.

Available Methods

The following methods, alone or in combination, can be used for monitoring:

- Conduct random inspections of high-risk (cargo) flights from regulated airports
- Conduct random inspections of high-risk flights from unregulated airports within the quarantine area
- Conduct a visual survey of the area where the beetle was initially trapped
- Increase the number of traps in areas where JB were previously captured

Chapter 4

Control Measures

Contents

Control Measures

The goal of airport control measures is to prevent the Japanese beetle (JB) from entering aircraft destined to protected Western States.

Use the following methods, alone or in combination, to control beetles at infested airports:

- Exclude Beetles from High-Risk Aircraft
- Reduce the Beetle Population Using Short- and Long-Term Controls
- Treating Infested Aircraft and Cargo

Exclude Beetles from High-Risk Aircraft

Beetles can be excluded using the following techniques:

- Change aircraft-operating areas to areas less attractive to the beetle
- Position aircraft with cargo doors in the shade rather than in the sun, which is less attractive to the beetle
- Safeguard cargo and baggage (e.g., keep containers closed, store containers in enclosed areas, cover cargo containers with plastic wrap)
- Schedule flights when the beetles are **not** flying (or fewer are flying)
- Use exclusion devices to prevent beetles from entering the aircraft
- Use physical barriers, such as enclosed walkways

Beetles often rest overnight on cargo pallets, cans (enclosed containers), and other devices for cargo handling; as a result, cargo stored outside for lengthy periods can become high risk. This is why it is essential to inspect **all** cargo prior to loading and practice safeguarding methods as outlined above.

Exclusion Devices

In certain situations, exclusion devices, called "excluders," will prevent the entry of beetles into aircraft. Excluders are enclosed compartments with an open side end designed to fit snugly against the surface of open aircraft hatches and doors to permit loading and unloading. Use exclusion devices whenever possible.

Because beetles tend to fly along the sunny side of a fuselage, they can often be excluded by the excluders. When the beetles encounter the excluders, they tend to drop below the open doors. Even if beetles enter the aircraft, the numbers entering will be greatly reduced.

Aircraft at regulated airports **must** be treated with an insecticide before exclusion devices can be used on open hatches and doors.

When exclusion devices are used, protect **all** openings in the aircraft from 7:00 a.m. to 8:00 p.m.

Passenger Compartments

Examples of exclusion devices used for passenger compartments are enclosed walkways and bus-type vehicles for passenger loading and unloading. The portholes of exclusion devices fit tightly against the aircraft.

When using exclusion devices for passenger boarding, thoroughly inspect **all** areas within 10 feet of the doors on the aircraft. Pay special attention to the floor and windowsills, and remove any beetles found.

Cargo Areas

Effective exclusion devices have been developed for cargo aircraft by carriers faced with a beetle entry problem. These excluders are now the standard for handling these aircraft at high-risk airports. Refer to Figure 4-1 for an example of a cargo exclusion device.

Figure 4-1 Example of a Cargo Exclusion Device[1]

[1] Photograph courtesy of Phillip Lewis, APHIS–PPQ–Science and Technology, Forest Pest Methods Laboratory.

Selecting Aircraft-Operating Areas

Certain aircraft-operating areas are much more likely to attract beetles than other locations. Therefore, whenever possible, avoid the following areas:

- Close to feeding hosts for the adult beetles
- Close to moist, grassy areas on light-textured soil favorable for egg laying and larval development
- With a favored sunny exposure

If areas attractive to beetles are used for aircraft operations, especially during the hours of greatest activity (7:00 a.m. to 8:00 p.m.), aircraft entries are likely.

Positioning Aircraft

If possible, position aircraft so **at least** its doors are in the shade. Beetles prefer sunny locations and are more likely to enter if doors and hatches are exposed to the sun.

Standby Aircraft

The standby aircraft that replace aircraft on scheduled flights **must** be JB free. “Tail-swapping” is the term for the replacement of one aircraft by another. When “tail-swapping” occurs, the standby aircraft may require treatment and safeguarding to prevent beetle movement on aircraft.

Reduce the Beetle Population Using Short- and Long-Term Controls

The following methods will lower the beetle population:

- Apply fast-acting insecticides to host plants to control adults
- Apply insecticides to the soil for larval control
- Destroy host plants and plant fewer desirable species as outlined in Table 2-1 and Table 2-2
- Use biocontrol agents such as those in Table 4-1
- If the airport is in an agricultural area, request that farmers treat host plants during the beetle season

Initiating Control

Ideally, control will begin before a beetle population reaches a high-risk level requiring regulation; therefore, both short- and long-term solutions should be sought.

Long-term control solutions emphasize integrated pest management (IPM) practices that will keep the beetle population below the high-risk level. Examples include:

- Biocontrol agents, such as the fungal pathogen *Ovavesicula*, have proven very effective in reducing JB populations. For more information about biocontrol agents, visit USDA-APHIS–PPQ Forest Pest Methods (Otis) Laboratory website or contact the Lab at 508-563-0900
- Landscape planning at the airport prevents planting host plants near aircraft-operating areas (refer to Table 2-1 and Table 2-2)

Short-term control solutions emphasize the quick reduction of a population at the high-risk level. Examples include:

- Foliar treatment of hosts
- Quick-acting soil insecticide
- Replace host plants with nonhost plants

When designing a control program for JB, it is wise to seek advice from IPM consultants, entomologists, cooperative extension personnel, and other professionals. Carriers have hired consultants who develop IPM programs that emphasize exclusion and are suitable for specific airports.

Removal and Reduction of Host Plants

Removing host plants can rapidly reduce a JB population in the long term and minimize the beetle transportation risk of aircraft; however, this can result in aesthetic loss and impact the environment. Careful planning and planting nonpreferred hosts can offset the damage caused by removal, and quickly restore an area. Competition for sunlight and other resources by nonhost plants can prevent resprouting and reestablishing removed host plants.

Treatments for Airport Grounds

Airport grounds are treated for either larvae (grubs) or adults. Approved treatments include chemical and biological control in addition to removing or reducing host plants.

Treatment for Larvae

Chemical Control

The major advantage of treating larvae (grubs) in the soil by fast-acting chemicals is the destruction of the grubs before they become adults; however, the practice is labor intensive and costly. Contact your local agricultural extension service for recommended chemicals.

Biological Control

The major advantage of biological control is the possibility of long-term reduction of the population to a nonthreatening level. However, significant long-term control may develop slowly or **not** at all.

Refer to Table 4-1 for a list of organisms used for biocontrol of the larvae. The control success rate varies.

Table 4-1 Organisms Used for Biocontrol of Japanese Beetle

Scientific Name:	Description:
Ovavesicula popillae	Microsporidian, a fungal-like organism against grubs
Bacillus thuringiensis tenebrionis (btt)	Bt strain for the JB grub
Heterorhabditis bacteriophora	Nematode effective against JB grubs
Steinernema glaseri	Nematode effective against JB grubs
Tiphia vernalis	Small wasp parasitic on the JB grub
Isocheta aldrichi	Tachinid fly, an internal parasitoid of the adult JB

NOTICE

Biocontrol agents against the larvae can be used in conjunction with those used to control adults.

Treatment for Adults

Chemical Control

A major advantage to treating adults by fast-acting chemicals is a quick reduction in the population. Often, however, those destroyed are quickly replaced by newly immigrating or newly emerged adults following a treatment. For a list of recommended chemicals, contact your local cooperative extension office.

Biological Control

The Tachinid fly, *Istocheta aldrichi*, is a solitary internal parasitoid of the **adult beetle**. The female flies deposit up to 100 eggs during a two-week period. Usually laid upon the thorax of the female beetles, the eggs hatch into maggots that bore into and kill their hosts. In ideal situations, this fly can suppress adults before they can reproduce.

Ovavesicula popillae, a microsporidian (fungal pathogen), that targets the larval stage, has shown to be very effective in reducing adult JB populations in the long term.

Monitoring Results of Control Methods

To monitor the effectiveness of short- and long-term control methods, use one or more of the following:

- Adult visual surveys
- Detections on aircraft arriving in the **JB-free** area
- Detections on aircraft at the infested airport
- Larval surveys
- Trapping

Refer to Airport Monitoring and Classification for details on each of these monitoring results.

NOTICE

The application of the methods to control JB populations are unique to each airport. Those airports that are currently regulated, or were regulated in the past 3 years, are required under 7 CFR 301.48 to develop both short- and long-term strategies for managing JB populations. Moreover, it is prudent for all airports within JB-infested States to take a proactive approach to manage JB populations so that more stringent measures and regulations can be averted.

Treating Infested Aircraft and Cargo

Currently, the following insecticides are approved for use on infested aircraft:

- 10% d-phenothrin
- 2% d-phenothrin + 2% permethrin (1-Shot™)

NOTICE

Before using any insecticide, read the instructions on the label.

Authorized by the *Treatment Manual* (T409-b-1), d-phenothrin is registered for use as an aerosol on aircraft in the 10% formulation (EPA registration number 10308-21.) Callington 1-Shot™, 2% d-phenothrin + 2% permethrin (EPA number 83795-1) is authorized as T409-b-3. Usually, application of these insecticides is either to passenger-carrying aircraft (when unoccupied) or loaded cargo aircraft (when unoccupied).

⚠ WARNING

D-phenothrin is for use by or under the direction of Federal/State personnel. **Only** personnel trained by the USDA can apply this insecticide. If trained by the USDA, airline personnel can apply this insecticide.

NOTICE

These insecticides are also used if, upon inspection of arriving aircraft, two or more live JB are found in a protected State. For further information regarding applications, visit the *Treatment Manual* section on Aerosols and treatment schedules T409-b-1 and T409-b-3.

Timing an Insecticide Application

Under the following conditions, adult beetles usually **do not** fly; therefore, treating aircraft may **not** be necessary:

- Cool days below 73 °F (23 °C) or hot days above 104 °F (40 °C)
- Rainy days
- When arriving and leaving during the same night
- Windy days

NOTICE

Although these represent conditions for **not** treating aircraft and cargo that is potentially infested, sometimes beetles deviate from established patterns and may fly on windy, hot, cold, or rainy days. Therefore, the State Plant Health Director's (SPHD) (or a designee) decision of whether to treat at-risk aircraft or cargo should be based on sound data and each State's unique needs. Moreover, protected States have the option of whether to treat an aircraft.

PPQ Form 250 Aircraft Clearance or Safeguard Order

Ideally, training potential applicators should start before hazardous conditions exist. To protect the health of applicators' and anyone who could be exposed, all pesticide applications **must** follow the recommended Federal and State labels and procedures.

For information and advice on safety procedures, visit USDA-APHIS-PPQ Forest Pest Methods (Otis) Laboratory website or contact the Lab via telephone at 508-563-0900 or U.S. mail or commercial carrier at:

USDA-APHIS-PPQ
Forest Pest Methods (Otis) Laboratory
1398 West Truck Road
Buzzards Bay, MA 02542-1329

Safety Precautions for Aircraft

- Read the insecticide label **before** applying; deviation from these instructions can endanger your health and the health of others
- **Never** eat or smoke while applying insecticides
- Thoroughly wash your hands and face after applying insecticides, especially **before** eating, drinking, or smoking
- **Always** wear long sleeves and pants
- Collect empty containers and follow label regarding disposal
- **Never** treat galleys or kitchen areas
- If treating the passenger compartment, **always** delay serving food or beverages until after the treatment
- **Never** apply any chemical treatment when passengers, crew, or animals are present
- Take precautions when applying d-phenothrin aerosols; instruct applicators to seek fresh air **immediately** if they feel light-headed or dizzy when applying the aerosol

⚠ DANGER

Seek fresh air **immediately** if you feel light-headed or dizzy.

Chapter 5

Compliance Agreements and Management

Contents

Definition of a Compliance Agreement

A Compliance Agreement (CA) is a written agreement between APHIS and an individual in a business engaged in growing, handling, or moving regulated articles. In a CA for the Japanese Beetle (JB), an individual agrees to comply with the Federal JB regulations (7 CFR 301.48). Adherence to these provisions will reduce the risk of JB introduction into protected States.

In addition to governing the procedures for moving regulated articles from JB-infested States, CAs can also be used to monitor the JB status of airports in protected States receiving infested flights from regulated airports. These and other examples are discussed on the following pages.

Using the Compliance Agreement for Monitoring Regulated Airports in JB-Infested States

Controlling and monitoring JB populations at regulated, high-risk airports in aircraft departing from infested States and destined to protected States is the chief purpose of the provisions outlined in 7 CFR 301.48. Remember, airports receive a regulated status **only** when the following risk criteria are met:

- JB adults observed flying near an aircraft-operating area
- High JB populations
- Potential for transport to a **JB-free** area in the west

Those airports listed as unregulated in infested States should monitor and control JB risk to aircraft to avoid further regulation. For example, by applying integrated pest management (IPM) practices, airports in infested States can maintain JB population at manageable levels, thereby reducing the threat to aircraft and avoid a regulated status. These flights, too, should be inspected according to each State's unique needs.

For a fillable copy of the Compliance Agreement PPQ Form 519, visit the USDA-APHIS forms library. Refer to Figure A-1 for an example of a completed form. The Compliance Agreement specifies the conditions under which monitoring will be conducted by asking the following questions:

- Are infested flights leaving the airport? If so, are they destined to protected States?
- If aircraft/cargo require treatment, what are the specific procedures?
- How will monitoring be conducted to safeguard aircraft from JB intrusion?
- When will the monitoring start and stop?
- Who will do the work?
- How will this information be recorded?
- How will the data be communicated and to whom?
- How will the JB populations be controlled (chemical/biological) to minimize risk?

The following statements are examples of stipulations that may be included on page two of the CA to minimize the risk of artificial/accidental JB spread.

- Aircraft may be re-treated in the protected State if **two or more** live beetles are discovered
- **All** aircraft **must** be treated **no more than** 1 hour prior to loading
- **All** areas around doors, hatches, and other openings **must** be inspected prior to removing exclusion devices—**all** doors and hatches **must** be closed **immediately** after the exclusion devices are removed
- **All** cargo containers that have **not** been safeguarded in a protected area **must** be covered with plastic wrap
- **All** openings of the aircraft **must** be safeguarded using exclusion devices, or similar devices, during the daylight hours of 7:00 a.m. to 8:00 p.m.
- **All** personnel **must** inspect their clothing for JB prior to entering the aircraft
- **All** containers **must** be inspected for JB prior to and during the loading process

Compliance Agreement for Monitoring Receiving Airports in Protected States

Airports in protected States that receive flights from infested States, particularly those classified as regulated, **must** be carefully monitored for the presence of JB. The following questions will help to design a monitoring program.

- How will monitoring be conducted?
- When will the monitoring start?
- Who will do the work?
- What is the procedure if JB are found?
- Who is contacted if JB are found?

Operating Under a Compliance Agreement

Authorized Inspectors

Authorized inspectors can be any APHIS employee or an individual authorized by APHIS to enforce the JB quarantine.

Access for Authorized Inspectors

An individual who enters into a CA (and employees or agents of that person) are required by 7 CFR 301.48 to provide authorized inspectors access to all areas where regulated materials are handled. Examples include:

- Aircraft-operating areas in protected States where unloading and servicing (and possibly treatment) occur
- Aircraft-operating areas at regulated airports where loading, unloading, servicing, and/or treatment of aircraft occur
- Secured areas of airports

To allow authorized inspectors access to secured areas, procedures should be in place as soon as possible.

NOTICE

Because gaining access to secured areas may take some time, preparation to obtain needed clearance should start as soon as possible. The State Plant Health Director (SPHD) should ensure employees obtain clearance for potential inspections **before** the need arises.

Recordkeeping and the Compliance Agreement

Any individual who enters into a CA (and employees or agents of that person) **must** maintain records of **all** treatment and mitigation measures for 2 years and present these to authorized inspectors upon request.

NOTICE

If a CA is **not** in place (because of a refusal to sign or any other cause), an Emergency Action Notice (EAN) will be used, when needed, for regulatory purposes.

Legal Recourse for Noncompliance

Title IV of the Agriculture Risk Protection Act of 2000, known as the Plant Protection Act (PPA), provides the authority to prohibit the interstate movement of plant pests (Section 411, Section 412). In addition, the PPA provides the authority to apply civil penalties for noncompliance. Refer to Section 424 for details.

Canceling a Compliance Agreement

If authorized inspectors determine that compliance was **not** satisfactory, they may cancel the CA using either oral or written communication. If the CA is canceled during a spoken discussion, within 20 days of cancellation the Authorized Inspector **must** write a letter confirming the oral cancellation and stating the reasons for the cancellation.

Appealing a Compliance Agreement

Within 10 days after receiving written notification of a cancellation, any person whose CA has been canceled may appeal the decision by writing to the APHIS Administrator. The appeal **must** provide evidence as to why they think the CA was wrongfully canceled. A hearing will be arranged by the APHIS Administrator to resolve the conflict.

As promptly as circumstances allow, a written appeal will be granted or denied specifying the reason for the decision. If it is canceled, it will remain so pending the next appeal.

Appendix

A

Forms

Contents

PPQ Form 519, Compliance Agreement

For a fillable copy of the Compliance Agreement PPQ Form 519, visit the USDA-APHIS Forms Library. Refer to Figure A-1 for an example of a completed form. An example of stipulations is in Figure A-2.

Clear Form

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a valid OMB control number. The valid OMB control numbers for this information collection are 0579-0015, 0049, 0054, 0088, 0124, 0155, 0187, 0310, 0317, 0322, 0337, 0346, 0363, 0383, and 0450. The time required to complete this information collection is estimated to average .50 to 1.25 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

OMB APPROVED
0579-0015, 0049, 0054, 0088, 0124, 0155, 0187, 0310, 0317, 0322, 0337, 0346, 0363, 0383, and 0450

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
PLANT PROTECTION AND QUARANTINE

COMPLIANCE AGREEMENT

1. NAME AND MAILING ADDRESS OF PERSON OR FIRM

JB Airways, Inc. (John Beetle)
245 AIrport Drive
Wilmington, OH 55555

2. LOCATION

Same, Clinton County
(555) 555-5555
jbeetle@jbairlines.com

3. REGULATED ARTICLE(S)

Japanese beetle

4. APPLICABLE FEDERAL QUARANTINE(S) OR REGULATIONS

Title 7, Code of Federal Regulations (CFR), Part 301.48 (domestic quarantine notices--Japanese beetle); Plant Protection Act (PPA) 7 U.S.C. 411, 412 et. seq.; and/or Animal Health Protection Act 7 U.S.C. 8301 et. seq.

5. I / WE AGREE TO THE FOLLOWING:

1. Keep all doors and cargo openings closed on regulated flights AT ALL TIMES when not in use. All doors and cargo openings on nonregulated flights should also remain closed when not actively being used.

2. Keep cockpit windows closed at all times when aircraft is on the ground.

3. Daily procedures: during the off-load, all personnel are to catch and destroy all beetles that enter the aircraft. After the off-load is complete, all doors are shut. At this time, the swatters lift all locks and look for any beetles that may be on board.

4. Treat the entire aircraft with an approved PPQ pesticide. All doors remain shut for a period of not less than 10 minutes after the spraying procedures are completed. All ramp representatives are required to verify the flight has been sprayed and is ready to go before any on-load procedures can be started.

5. Excluders will be used on all regulated aircraft as directed by USDA-APHIS-PPQ.

6. All excluders will be inspected prior to docking to aircraft. Remove and destroy all beetles found.

7. All empty cans must be inspected for beetles BEFORE being loaded with cargo; all beetles must be removed.

8. Ball-mat area must be kept clean and free of litter; either by vacuuming or removal by the excluder team. Personnel are equipped with 3-cell flashlights to inspect the area for beetles.

SEE ATTACHED FOR FURTHER STIPULATIONS.

6. SIGNATURE	7. TITLE	8. DATE SIGNED
	Ramp Manager	05/21/2022

The affixing of the signatures below will validate this agreement which shall remain in effect until canceled, but may be revised as necessary or revoked for noncompliance.

9. AGREEMENT NUMBER
OH-Wilmington-JBA-5

10. DATE OF AGREEMENT
05/21/2022

11. PPQ/CBP OFFICIAL (NAME AND TITLE)	12. ADDRESS
Jane Doe, PHSS/PPQ Officer	USDA-APHIS-PPQ 1234 Main Street Wilmington, OH 55555
13. SIGNATURE	
14. U.S. GOVERNMENT/STATE AGENCY OFFICIAL (NAME AND TITLE)	**15. ADDRESS**
John Doe, Agriculture Inspection Manager	Ohio Department of Agriculture 555 Broad Street Columbus, OH 55555
16. SIGNATURE	

PPQ FORM 519
SEP 2012

All previous editions are obsolete.

Figure A-1 Example of Completed PPQ Form 519, Compliance Agreement

UNITED STATES DEPARTMENT OF AGRICULTURE ANIMAL AND PLANT HEALTH INSPECTION SERVICE PLANT PROTECTION AND QUARANTINE COMPLIANCE AGREEMENT FOR: JB AIRWAYS, INC.	STIPULATIONS FOR JAPANESE BEETLE (1 PAGE)

STIPULATIONS CONTINUED

9. After the on-load is complete, close the door to the point of about 12 inches. During this closing process, monitor the bottom door seal for any beetles that may have fallen into this area. Then spray the entire area around the door iwith the insecticide d-phenothrin, for added protection. After this, completely close the door while monitoring the door for bugs.

10. As the main cargo door is being closed, two excluder team members must be as close as possible to the door to prevent beetles from entering---this is the highest risk time frame of the entire process. It is imperative the cargo doors be closed AS QUICKLY AS POSSIBLE once on-load is complete.

11. Exclusion team personnel must monitor all nonprotected cargo holds and door openings AT ALL TIMES while they are opened; from block time to take off.

12. All cans and pallets must be covered with plastic as directed by USDA-APHIS-PPQ.

13. All cans must be inspected immediately BEFORE and AFTER entering the excluder.

14. All personnel boarding the aircraft must be inspected for beetles attached to clothing PRIOR to entering the aircraft. Remove and destroy all beetles.

15. Immediately before aircraft departure, thoroughly inspect cockpit and galley area. Remove and destroy all Japanese beetles.

16. Complete "Japanese Beetle Activity Record."

17. If regularly scheduled aircraft are replaced with an alternate aircraft, it must be inspected and all Japanese beetles must be removed. Also, all treatment and safeguard requirements applicable to the regularly scheduled aircraft must be implemented.

18. Aircraft treatment records must be maintained for 2 years.

19. Failure to comply with the Japanese beetle regulations and/or provisions of this Compliance Agreement may result in cancellation of this Compliance Agreement and/or assessment of civil penalties.

20. For more information, contact your local USDA-APHIS-PPQ offices. For updates to the *Japanese Beetle Program Manual,* visit https://www.aphis.usda.gov/import_export/plants/manuals/domestic/downloads/japanese_beetle.pdf.

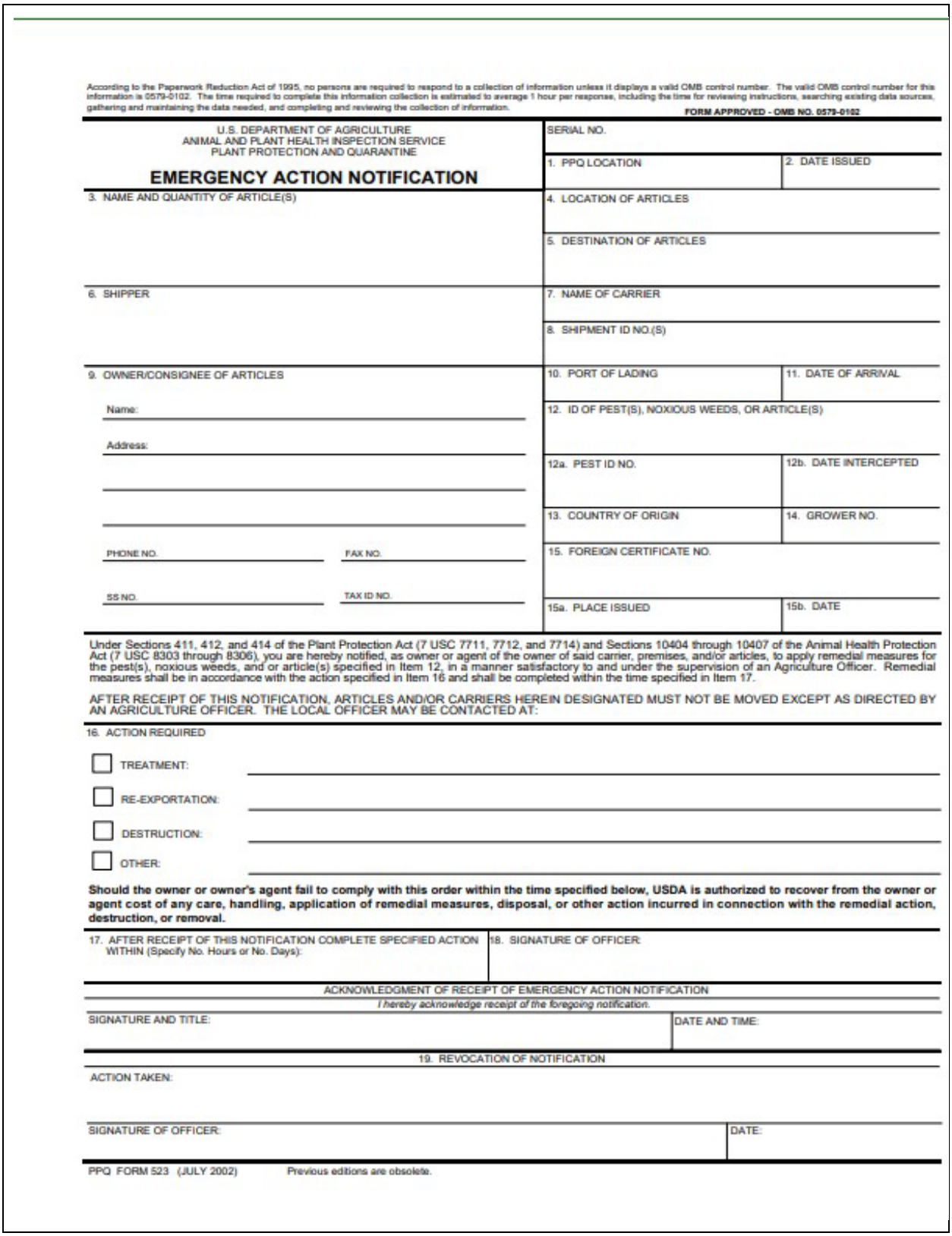
Figure A-2 Example of Completed PPQ Form 519, Compliance Agreement Stipulations

PPQ Form 523, Emergency Action Notification

Use PPQ Form 523 (EAN) when either of the following conditions occur:

- Condition 1: when a Japanese beetle (JB)-infested aircraft is intercepted at an airport in a **JB-free** State; or
- Condition 2: when aircraft leaving an airport in a JB-infested area are likely to be JB infested

When the first condition occurs, use the EAN to obtain treatment of the infested aircraft. When the second condition occurs, use the EAN to regulate the airport. Refer to Figure A-3 for an example EAN.



According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information is 0579-0102. The time required to complete this information collection is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

FORM APPROVED - OMB NO. 0579-0102

U.S. DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
PLANT PROTECTION AND QUARANTINE

EMERGENCY ACTION NOTIFICATION

SERIAL NO.

1. PPQ LOCATION | 2. DATE ISSUED

3. NAME AND QUANTITY OF ARTICLE(S)

4. LOCATION OF ARTICLES

5. DESTINATION OF ARTICLES

6. SHIPPER

7. NAME OF CARRIER

8. SHIPMENT ID NO.(S)

9. OWNER/CONSIGNEE OF ARTICLES

Name:

Address:

PHONE NO. | FAX NO.

SS NO. | TAX ID NO.

10. PORT OF LADING | 11. DATE OF ARRIVAL

12. ID OF PEST(S), NOXIOUS WEEDS, OR ARTICLE(S)

12a. PEST ID NO. | 12b. DATE INTERCEPTED

13. COUNTRY OF ORIGIN | 14. GROWER NO.

15. FOREIGN CERTIFICATE NO.

15a. PLACE ISSUED | 15b. DATE

Under Sections 411, 412, and 414 of the Plant Protection Act (7 USC 7711, 7712, and 7714) and Sections 10404 through 10407 of the Animal Health Protection Act (7 USC 8303 through 8306), you are hereby notified, as owner or agent of the owner of said carrier, premises, and/or articles, to apply remedial measures for the pest(s), noxious weeds, and or article(s) specified in Item 12, in a manner satisfactory to and under the supervision of an Agriculture Officer. Remedial measures shall be in accordance with the action specified in Item 16 and shall be completed within the time specified in Item 17.

AFTER RECEIPT OF THIS NOTIFICATION, ARTICLES AND/OR CARRIERS HEREIN DESIGNATED MUST NOT BE MOVED EXCEPT AS DIRECTED BY AN AGRICULTURE OFFICER. THE LOCAL OFFICER MAY BE CONTACTED AT:

16. ACTION REQUIRED

☐ TREATMENT:

☐ RE-EXPORTATION:

☐ DESTRUCTION:

☐ OTHER:

Should the owner or owner's agent fail to comply with this order within the time specified below, USDA is authorized to recover from the owner or agent cost of any care, handling, application of remedial measures, disposal, or other action incurred in connection with the remedial action, destruction, or removal.

17. AFTER RECEIPT OF THIS NOTIFICATION COMPLETE SPECIFIED ACTION WITHIN (Specify No. Hours or No. Days):

18. SIGNATURE OF OFFICER:

ACKNOWLEDGMENT OF RECEIPT OF EMERGENCY ACTION NOTIFICATION

I hereby acknowledge receipt of the foregoing notification.

SIGNATURE AND TITLE: | DATE AND TIME:

19. REVOCATION OF NOTIFICATION

ACTION TAKEN:

SIGNATURE OF OFFICER: | DATE:

PPQ FORM 523 (JULY 2002) Previous editions are obsolete.

Figure A-3 Example of PPQ Form 523, Emergency Action Notification

PPQ Form 250, Aircraft Clearance or Safeguard Order

If requested by personnel at a destination airport, issue PPQ Form 250 to the pilot after treating an aircraft. However, if personnel **do not** request PPQ Form 250, **do not** issue the document.

For a fillable copy of the Aircraft Clearance or Safeguard Order PPQ Form 250, visit the USDA-APHIS Forms Library.

NOTICE

This document is **not** accessible to **non**-APHIS employees.

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0579-0094. The time required to complete this information collection is estimated to average .0835 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. FORM APPROVED OMB NO. 0579-0094

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
PLANT PROTECTION AND QUARANTINE

AIRCRAFT CLEARANCE OR SAFEGUARD ORDER

1. AIRCRAFT NO. | 2. TRIP/FLIGHT NO. | 3. NAME OF CARRIER
4. FOREIGN ORIGIN *(When applicable)* | 5. PLACE OF DEPARTURE *(U.S.)*
6. DESTINATION AIRPORT OR AIR BASE *(U.S.)*

THE ABOVE AIRCRAFT HAS BEEN INSPECTED AND -

7. ☐ **COMPLETELY CLEARED** *(including all baggage, personal effects, stores, garbage, and cargo.)*
8. ☐ **PARTIALLY CLEARED** *(Exceptions and safeguard conditions noted in item 11 below.)*

9. SIGNATURE OF PLANT PROTECTION AND QUARANTINE OFFICER | 10. DATE

11. EXCEPTIONS AND SAFEGUARD CONDITIONS

14. FINAL DISPOSITION ACTION

15. SIGNATURE OF PLANT PROTECTION AND QUARANTINE OFFICER | 16. DATE

AFTER FINAL DISPOSITION ACTION RETURN TO:

17. NAME AND ADDRESS OF ORIGINATING OFFICE

I agree to see the conditions in item 11 are carried out.

12. SIGNATURE OF AIRCRAFT COMMANDER | 13. DATE

PPQ FORM 250
(FEB 2007)

(Previous editions may be used)

Figure A-4 Example of PPQ Form 250, Airport Clearance or Safeguard Order

Japanese Beetle Aircraft Inspection Record (JBAIR)

The JBAIR is a record used at receiving airports in protected States to document the interception of JBs on arriving flights.

Japanese Beetle Aircraft Inspection Record

Date: _____ Arrival Time: _____

Airport: _____ Time of Inspection: From: _____ To: _____

Carrier: _____ Inspectors: _____

Flight No.: _____ PDR/309# _____

Origin: _____ Treated at destination? o Yes o No

Route: _____ EAN issued? (attach copy) o Yes o No

Regulated at origin? o Yes o No Notice of violation issued? o Yes o No

Tail No.: N_____ Applicators: _____

Aircraft Type: _____ _____

Indicate location and condition of beetles found and total for each category:

	Cockpit	Cabin, Galley or Toilet (circle one)	Main Cargo Door Sill	Ball Mat or Vicinity	Main Cargo Area	Belly Hold (front)	Belly Hold (rear)	Other (specify)	Other (specify)	TOTAL:	No. Morb. Held:
DEAD (Dried):											
DEAD (Fresh):											
MORIBUND:											
ALIVE:											
TOTAL:											

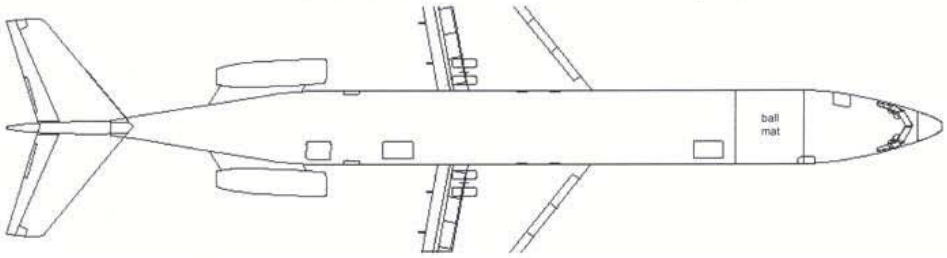
DEAD-dried (DD): No independent movement or response when stimulated. Dried out, appendages brittle. Beetle may be whole, broken or fragmented.

DEAD-fresh (DF): Same as above except appendages flexible, not brittle. Note: beetles may just be "playing" dead or cold. If motionless, allow beetles to warm up in hand or place in a vial in pocket for 20-30 seconds before evaluating.

MORIBUND (M): In advanced stages of dying. Capable of only minimal uncoordinated movement of appendages e.g. legs or antennae twitching, often on back and unable to right themselves. Incapable of coordinated movement (e.g. walking more than one body length) when warm. Incapable of feeding if held for observation.

ALIVE (A): Alert and active. Capable of coordinated movement when warm e.g. righting themselves if on back, walking at least one body length, responding to stimuli, struggling to escape, capable of feeding if allowed etc. Antennae out and open.

Indicate number, location and condition (DD, DF, M, A) of beetles found on the following diagram:



Please note specific locations of beetles found, additional comments, notes etc. (use back if necessary). Observation Results:

_____

_____

_____

_____

Hours	Alive	Dead	Morb.
12			
24			
48			

Rev. 6/6/03

Figure A-5 Example Japanese Beetle Aircraft Inspection Record (JBAIR)

Japanese Beetle Program Manual

Glossary

Introduction

Use this Glossary to find the meaning of specialized words, abbreviations, acronyms, and terms used in the Japanese Beetle Program.

Definitions—Terms and Abbreviations

adult stage. fourth and final life stage of the JB

adult visual surveys. used to determine the level of the beetle population in aircraft-operating areas. A minimal level of monitoring requires visual surveys of aircraft-operating areas in airports that were **regulated in any of the last 3 years**.

Aircraft Clearance or Safeguard Order (PPQ Form 250). the document issued to the pilot after inspection and, possibly, treatment of an aircraft. Usually, this document is issued when requested by a destination airport in the **JB-free** area. If personnel at the destination airport **do not** request a PPQ Form 250, the document is **not** issued. Refer to an example of PPQ Form 250, Aircraft Clearance or Safeguard Order.

aircraft-operating areas. areas of an airport in which one or more of the following activities occur:

Aircraft maintenance

- Cargo handling
- Luggage handling
- Passenger boarding

APHIS. Animal Plant Health Inspection Service. An agency within the United States Department of Agriculture (USDA). The APHIS mission is to protect U.S. animal and plant resources

APHIS-PPQ Treatment Manual. contains accepted treatments for various commodities including aircraft (T409)

Armed Forces Pest Management Board Technical Guide 31, Operation Washdown and Agricultural Inspection Preparation for Military Conveyances and Equipment. technical guide (TG) that describes procedures, outlines responsibilities, and defines requirements for preparing military conveyances (vehicles, vessels, aircraft), rolling stock, equipment, cargo, and unit and personal gear to comply with agricultural and public health pest exclusion requirements for movement of ships, aircraft, equipment, and personnel, particularly from locations outside the

United States. Note that TGs are **not** policy documents; they provide best management practices and technical guidance for the U.S. Department of Defense (DoD) operations, pest management, natural resources, and other DoD communities. Accordingly, TGs should **not** be construed or referenced as policy. Found in DTR Part V, Chapter 505 (Agricultural Cleaning and Inspection Requirements).

authorized inspector. any employee of APHIS (or any individual authorized by the APHIS Administrator) to enforce the JB quarantine

biocontrol agents. as the use of natural efficient strains of any microorganisms or modified organisms that reduce the incidence or severity of diseases caused by plant pathogens

biological control. the use of living organisms to control pests. A natural enemy such as a parasite, predator, or disease organism is introduced into the environment of a pest or, if already present, is encouraged to multiply and become more effective in reducing the number of pest organisms.

Canadian Food Inspection Agency (CFIA). Canadian government agency dedicated to safeguarding food, animals and plants, which enhances the health and well-being of Canada's people, environment and economy

chemical control. a variety of chemicals are available that have been designed to control plant diseases by inhibiting the growth of or by killing the disease-causing pathogens. Chemicals used to control bacteria (bactericides), fungi (fungicides), and nematodes (nematicides) may be applied to seeds, foliage, flowers, fruit, or soil.

Code of Federal Regulation (CFR). Parts 300 to 309—published by the Office of the Federal Register (National Archives and Records Administration (NARA)) at the United States Government Printing Office (GPO). Information on the JB is found in 7 CFR 301.48.

Compliance Agreement (CA) (PPQ Form 519). a written agreement between APHIS and an individual in a business engaged in growing, handling, or moving regulated articles. In addition to governing the procedures for moving regulated articles form JB-infested States, CAs can also be used to monitor the JB status of airports in protected States receiving infested flights from regulated airports.

Defense Transportation Regulations (DTR). DTR 4500.9-R, Part II, Chapter 208 (Packaging and Handling); document providing DoD general guidance on the handling of packaged material.

egg stage. first life stage of the JB

elytra. hardened forewings of beetles that provide protection

Emergency Action Notification (EAN) (PPQ Form 523). a document that may be issued to hold articles or facilities, pending positive identification and/or further instruction from the USDA-APHIS-PPQ Deputy Administrator. This document is issued by a PPQ inspector to notify an owner or agent of carrier, premises, and/or articles, to apply specific remedial measures to prevent the potential spread of a plant pest or disease. The official Federal authorization of hold.

exclusion devices (excluders). designed to prevent or reduce the entry of JBs into aircraft during loading, unloading, and maintenance, excluders are a critical component of any JB management program. They will vary in size based on local environmental factors and facilities and they may

be simple, such as netting (cloth or screen) covering the opening of an aircraft, or complex, such as a framed or covered structure.

first instar larvae. newly hatched JB larvae; length of instar is 10.5 mm, width of head is 1.2 mm

generally JB-infested States. Arkansas, Iowa, and Missouri

grubs. young form of an insect

high-risk aircraft. those aircraft scheduled to fly to protected States after probable exposure to infestation by the JB or carrying cargo probably exposed to infestation. Because high-risk aircraft may be infested, they are regarded as regulated articles.

infested State. those States in which surveys have found JB is established throughout the State or in a portion of the State

instar. stage in the life of an arthropod (such as an insect) between two successive molts

Integrated Plant Health Information System (IPHIS) Database. web-based application providing a single, standardized, and comprehensive data management system capable of supporting activities associated with domestic or emergency pest programs.

Japanese beetle policy. to protect the agriculture and natural resources of the Western United States by preventing the human-assisted spread of the JB from the Eastern United States on aircraft.

Japanese Beetle Aircraft Inspection Record (JBAIR). the form used by receiving airports to document the interception of JB on arriving flights.

Japanese beetle-FREE area. an area in which JB is **not** established. All protected States are JB free (Note: there are JB-free areas **not** located in protected States).

Japanese beetle flight period. June through September

Japonilure. an attractant placed in JB traps

larvae. stage in the development of many animals, occurring after birth or hatching and before the adult form is reached

larval stage. second life stage of the JB

larval surveys. surveys most often conducted to determine the most common life stage and the population level; they may be used alone or in combination with traps

low-risk situation. beetles are **not** likely to enter aircraft in an aircraft-operating area

National Agricultural Pest Information System (NAPIS). the information-management system developed to handle data on endemic and exotic pests from regulatory officials and scientists in the State departments of agriculture, scientists from land-grant universities, and regulatory officials within APHIS. Located at Purdue University (West Lafayette, IN), the NAPIS Database contains information on the JB, one of many introduced pests tracked by the database.

national operations manager (NOM). person in charge of the national Japanese beetle program

new county records (NCR). data input into National Agricultural Pest Information System (NAPIS) at the first find of a beetle infestation in a county

new state records (NSR). data input into National Agricultural Pest Information System (NAPIS) at the first find of a beetle infestation in a State

nonpreferred hosts/nonhosts. plants that are rarely or never fed on such as evergreens, common grains, most truck and field crops, and many of the common ornamental flowers. When beetles are abundant, plant damage may be avoided by using species immune or seldom attacked by the insect

nonregulated airports. airports in the JB-regulated area where JB is **not** likely to enter aircraft and be transported to protected States (and other **JB-free** areas)

partially JB-infested States. Kansas, Minnesota, Nebraska, Oklahoma, South Dakota, and Texas

Ovavesicula popillae. microsporidian, a fungal-like organism against grubs; targets the larval stage and has shown to be very effective in reducing adult JB populations in the long term

peak emergence period. adult beetles begin to emerge in May in southern localities, later in northern localities. Peak adult activity occurs 4 to 6 weeks after emergence starts

PEG. a food-type lure using a combination of phenyl ethyl propionate, eugenol, and geraniol in a ratio of 3:7:3

phenology. the study of phenomena or happenings. It is applied to the recording and study of the dates of recurrent natural events (i.e., emergence of Japanese beetle populations) in relation to seasonal climatic changes

Plant Protection Act (PPA). from June 20, 2000, modernized and streamlined the plant quarantine laws and replaced the previous legislation. Information is available in 7 USC 7701-36, with sections 14, 15, 23, 24, and 31 addressing specific issues

Plant Protection and Quarantine (PPQ). the operational program within APHIS responsible for preventing the spread of significant plant pests

preferred hosts. JB are gregarious general feeders on leaves, flowers, and fruits; their preferred hosts include small fruits, tree fruits, garden crops, ornamental shrubs, vines, and trees. Studies indicate adult JB feed on over 300 species of plants representing 79 families

protected States. the Western States free of JB: Arizona, California, Colorado, Idaho, Montana, Nevada, Oregon, Utah, and Washington. In cooperation with APHIS and using the authorization in 7 CFR 301.48, these nine protected States are taking action to remain **free** of JB.

pupal stage. third life stage of the JB

regulated airport. those airports, in the JB-infested area under quarantine, at which JB is likely to enter aircraft and be transported to **JB-free** areas; because of the threat to **JB-free** areas, these airports are “regulated” in that they **must** adopt certain practices to protect the **JB-free** areas.

regulated articles. aircraft that are at or from regulated airports

sampling protocol. the procedure used to select units from a study population to be measured. The goal of the sampling protocol is to select units that are representative of the study population with respect to the attribute(s) of interest

second instar larvae. second stage of hatched JB larvae; length of instar is 18.5 mm, width of head is 1.9 mm

State Plant Health Director (SPHD). the APHIS-PPQ employee who has overall responsibility for Federal programs dealing with exotic and endemic pests. The SPHD works closely with personnel in the State department of agriculture

State Plant Regulatory Official (SPRO). the authorized State official responsible for operating the State plant regulatory program.

third instar larvae. third stage of hatched JB larvae; length of instar is 32 mm, width of head is 3.1 mm

United States Department of Agriculture (USDA). the Federal agency providing leadership on food, agriculture, natural resources, and related issues

United States Domestic Japanese Beetle Harmonization Plan. the National Plant Board working with USDA-APHIS-PPQ and the American Nursery and Landscape Association developed the U. S. Domestic Japanese Beetle Harmonization Plan. This plan establishes procedures for the free movement of JB host commodities

United States Environmental Protection Agency (EPA). the Federal agency leading the nation’s environmental, science, research, education, and assessment efforts