



U.S. Domestic

Japanese Beetle

Harmonization Plan

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National Plant Board
U.S. Domestic Japanese Beetle Harmonization Plan
August 19, 1998; Last Revision March 4, 2016 (update of Appendices 7 & 8 only)

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I. GOALS AND BACKGROUND

The USDA, the National Plant Board and the regulated industry support the continuing harmonization of Japanese Beetle (JB) quarantine and certification requirements. The purpose of the plan is to assure that the pest risks are acceptably managed and to facilitate the orderly marketing of nursery stock and other regulated commodities in a manner consistent with the *National Plant Board Plant Quarantine, Nursery Inspection, and Certification (PQNIC) Guidelines*.

Specific objectives toward this goal are to:

- 1) Establish a framework that encourages states to consistently and appropriately characterize Japanese beetle pest risk and infestation status based on up-to-date scientific and field information;
- 2) Pursue more uniform adoption and implementation of pest risk mitigation measures to reduce pest risk to a level acceptable to receiving states.

It is universally accepted that quarantine action must be shown to be necessary, reasonable, technically justified and limited to the action needed to adequately mitigate the assessed pest risk (see Appendix 4). Alternatively, states may regulate for harmful non-quarantine pests and thus may establish commodity entry standards to mitigate against this important pest risk. Pests regulated under such commodity entry standards are referred to as a "quality" or "regulated non-quarantine" pests. Such pest standards generally involve a potentially broader array of growing practices, inspection, and/or treatment protocols, in order to meet a less stringent pest freedom standard than a formal quarantine.

Since no harmonization plan is legally binding to receiving states, it will not preclude legally established quarantine or other regulatory action established by any state if that state determines such action to be necessary, reasonable, and enforceable based on plant quarantine principles established by the National Plant Board. It is the goal of the National Plant Board's harmonization effort to provide guidelines in this document that states will use when considering quarantine or other regulatory action against Japanese beetle. Consistent application of harmonization principles by state plant regulatory officials is expected to enhance industry understanding and compliance.

To accomplish this:

- States agree to apply host commodity shipment requirements uniformly. Interstate movement of host commodities within the U.S. should be consistent with principles applied in this plan.
- Nursery operators, brokers, buyers, and any other entities involved in the shipment of regulated host commodities from Japanese beetle-infested areas are responsible for understanding and complying with certification requirements of destination states.
- Special care will be taken when brokering or transshipping plant material. Regulated commodities must either meet requirements of the ultimate destination at the time they leave the state of origin, or they must be treated or otherwise handled at any intermediate destination(s) so as to meet destination state requirements.

Concepts fundamental to harmonization are:

- Quarantine regulations should be reasonable, feasible, and enforceable.
- A quarantine's stated purpose must be a reasonable expectation.
- Quarantines should be adopted only for pests determined to be quarantine significant based upon pest risk analysis.
- States may regulate commodity quality for non-quarantine pests.
- Importing states retain the right to establish commodity entry standards; such entry standards should conform with harmonization principles to the fullest extent possible.
- Phytosanitary and nursery stock certificates are used to verify quarantine compliance and nursery stock cleanliness, respectively.

Under this plan the movement of nursery and greenhouse plants from infested areas to areas with a Japanese beetle regulatory strategy shall be governed as follows:

- A state phytosanitary certificate, or an equivalent certification of quarantine compliance, will be required for nursery stock moving to states that consider Japanese beetle a quarantine pest.
- A nursery stock certificate with an additional declaration or equivalent documentation attesting to compliance with this harmonization plan will accompany nursery stock moving to states that consider Japanese beetle a regulated non-quarantine or quality pest.

Various trapping strategies are provided in this plan for states to use to verify or assess their Japanese beetle infestation status. If Japanese beetle is detected within a non-infested state, particularly one with no Japanese beetle quarantine or pest prevention program, that state will not be considered infested if it delimits and eradicates any incipient infestations to assure the continued shipment of Japanese beetle-free host commodities. Alternatively, that state may opt to certify nursery and greenhouse crops in accordance with any applicable protocol found within the plan. States that take proactive action to ascertain and track the status of Japanese beetle once it is detected will thus be able to avert more stringent regulatory actions by other states.

II. CRITERIA FOR DETERMINING JAPANESE BEETLE INFESTATION STATUS

Japanese beetle infested areas include any county, parish, regional municipality, or state that is known to harbor an infestation. The determination of infested status will be based on detection and delimitation surveys (see Appendices 1, 2, and 4). Detection surveys are conducted for two purposes: to detect introduced populations and to verify freedom from infestation.

Generally, any location or area may be considered infested with Japanese beetle when:

- Multiple numbers of adult Japanese beetle are detected within the same area in a single year;
- Adult Japanese beetle are trapped at the same location for two or more successive years *or*;
- An alternate life stage is found associated with the detection of an adult(s).

For a specific area, infestation status will be determined based on the above criteria as it applies to the state's Japanese beetle regulatory strategy and survey levels employed.

Any area not annually monitored for the presence of Japanese beetle can be considered infested once Japanese beetle is detected. *A state or county will be considered infested if no delimitation or mitigation action is taken once Japanese beetle is detected, or after two consecutive years of detections.*

Where recommended delimitation and eradication measures are conducted and appropriate regulatory action is taken, the regulated area may be considered smaller than a county or parish jurisdiction. An infested area will retain its infested status until eradication efforts have resulted in two subsequent and consecutive years of negative traps surveys conducted at the delimitation level after the last eradication treatment has been applied.

III. DEFINITIONS

Definitions of terms and words used in this plan are listed and defined alphabetically in Appendix 6. In the interest of consistency, applicable definitions from the National Plant Board¹, the International Harmonization Plan (IHP)², or North American Plant Protection Organization (NAPPO)³ are used where appropriate.

IV. REGULATORY STRATEGIES

The free movement of commodities that may host Japanese beetle *between* and *among* states, and portions thereof of *equal pest status*, is allowed when consistent with standard phytosanitary and nursery inspection practices designed to prevent artificial movement of plant pests.

This plan provides four Japanese beetle regulatory strategies based on a state's pest classification as listed in Appendix 7. Regulatory harmonization will be achieved through consistent application of these strategies. The categories are listed below:

Category 1 - Uninfested/Quarantine Pest

- Japanese beetle is not known to be established in the state based on official surveys , **and**
- There is risk of entry via artificial means, natural spread from an infested area is not imminent or likely, **and**
- State has conducted a pest risk assessment and found the expected pest impact to be moderate to high, **and**
- Pest impact can only be mitigated to an acceptable level by applying quarantine certification protocols, **and**
- State has officially adopted and maintains a quarantine to prevent the entry of Japanese beetle and State has active eradication program in place for any incipient populations.

¹ Plant Quarantine, Nursery Inspection and Certification Guidelines, National Plant Board, approved August 16, 1995, pages 35-42.

² Canada - United States Japanese Beetle Harmonization Plan, approved March 1996. Revised as Directive D-96-15 Title: Phytosanitary Requirements to Prevent the Spread of Japanese Beetle, *Popillia japonica* in Canada and the United States. July 21, 2006.

³ NAPPO Compendium of Phytosanitary Terms, NAPPO, February 1996.

Category 2 – Uninfested or Partially Infested/Regulated Non-Quarantine Pest

- Japanese beetle is not known to be established in the state based on official surveys, **or**
- Japanese beetle is established in limited areas of the state, **and**
- Japanese beetle is likely to spread into or through state by artificial means, natural spread from infested area over time is not preventable, and Japanese beetle could survive in state, **and**
- State has conducted a pest risk assessment and expects moderate to low pest impact, **and**
- Impact can be mitigated to an acceptable level by applying the regulated non-quarantine pest certification protocols and State has active eradication program in place for any incipient populations.

Category 3 – Partially or Generally Infested/No Regulatory Significance

- Generally infested and partially infested states where infestations are sufficiently widespread that natural spread cannot be effectively slowed, and regulation of host commodities is not likely to be effective.
- Commodity movement is consistent with nursery certification programs designed to minimize the artificial movement of plant pests only.

Category 4 – Historically Not Known To Be Infested/No Regulatory Significance

- States (or designated divisions within states) where Japanese beetle natural spread is not likely to occur or where Japanese beetle is not likely to survive or become a pest, **and**
- States plan to take no official control or other regulatory action if/when Japanese beetle is detected, **and**
- Entry of Japanese beetle host commodities is consistent with nursery certification programs designed to minimize the artificial movement of plant pests only.

V. HARMONIZATION PLAN MODIFICATIONS

This plan will become valid immediately upon signature. Any modifications to the plan (*except additions, deletions, or changes to the list of regulatory treatments and lists of infested or partially infested states*) will require the agreement of all signatories.

Additions, deletions, or changes to the list of regulatory treatments and lists of infested or partially infested states, will only require the approval of the National Plant Board Executive Committee.

The list of Japanese beetle infested areas in Appendix 7 and the list of partially infested areas in Appendix 8 will be updated regularly by consensus of a Japanese Beetle Survey Committee in consultation with the individual states.

In addition, at any time, a state may petition the President of the National Plant Board for a change in their Japanese beetle regulatory status category. The committee's membership will be appointed by the President of the National Plant Board and will include:

- Chair: USDA APHIS PPQ Japanese Beetle Program Manager.
- Members:
 - USDA APHIS PPQ National Survey Coordinator (NAPIS/CAPS)
 - One (1) Central Plant Board representative.
 - One (1) Eastern Plant Board representative.
 - One (1) Southern Plant Board representative.
 - One (1) Western Plant Board representative.
 - One nursery industry representative (recommended by the American Nursery and Landscape Association).
 - Ad hoc members:
 - One representative from each of the state(s) under consideration.

The Japanese Beetle Survey Committee will base a state's infestation status on data contained in the NAPIS database (e.g., contents of the NAPIS "pest status" data field) and on supplemental information supplied by the states. USDA PPQ's national Japanese beetle program manager will annually solicit supplemental information from the states for use by this committee. Updates to Appendices 7 and 8 will be made as the Japanese Beetle Survey Committee makes any change in infestation status.

The National Plant Board President shall also appoint a Japanese Beetle Regulatory Treatment Review Committee whose responsibility will be to keep the approved regulatory treatments sections of this plan current with available science and registered materials or uses. The committee's membership will include:

- Chair: USDA APHIS PPQ Regulatory Treatments Program Coordinator (from Otis Plant Protection Center)
- Members:
 - Two (2) National Plant Board officials representing category 1 states.
 - Two (2) National Plant Board officials representing category 2 states.
 - Two (2) National Plant Board officials representing category 3 states.
 - Two to four outside researchers (recommended by Otis Plant Protection Center)
 - One nursery industry representative (recommended by the American Nursery and Landscape Association).

When the committee approves and recommends a new treatment, the National Plant Board will amend the appropriate appendices of this Plan to include the treatment, and will provide copies to the states.

APPENDIX 1.

SHIPMENT TO CATEGORY 1 STATES

Nursery stock that is being shipped bare root is **not** considered regulated stock.

Regulated nursery stock (except sod) can be shipped to category 1 states based on one of the following certification options. States which require advance notification of regulated commodity shipments are listed in Appendix 7.

Certification Options

1. Production in an Approved Japanese Beetle Free Greenhouse/Screenhouse.

All the following criteria apply:

- All media must be sterilized, except for commercially processed or prepared (soilless) growing material.
- All stock must be free of soil (bareroot) before planting into the approved medium.
- The potted plants must be maintained within the greenhouse/screenhouse during the entire adult flight period.
- During the adult flight period the greenhouse/screenhouse must be made secure so that adult Japanese beetle can not gain entry. Security will be documented by the appropriate phytosanitary official.
- No Japanese beetle contaminated material shall be allowed into the secured area at any time.
- The greenhouse/screenhouse will be officially inspected by phytosanitary officials and must be specifically approved as a secure area. They shall be inspected by the same officials for the presence of all life stages of the Japanese beetle.
- The plants and their growing medium must be appropriately protected from subsequent infestation while being stored, packed and shipped.
- Certified greenhouse/screenhouse nursery stock may not be transported into or through any infested areas unless identity is preserved and adequate safeguards are applied to prevent possible infestation.
- Each greenhouse/screenhouse operation must be approved by the phytosanitary officials as having met and maintained the above criteria, and issued an appropriate certificate bearing the following Additional Declaration (AD): *"The rooted plants (or crowns) were produced in an approved Japanese beetle free greenhouse or screenhouse"*.

2. Production During a Pest Free Window.

The entire rooted plant production cycle will be completed within a pest free window, in Japanese beetle-free commercial growing medium or sterilized field soil, i.e., planting, growth, harvest, and shipment will occur outside the adult Japanese beetle flight period, June through September. The accompanying phytosanitary certificate shall bear the following Additional Declaration (AD):

"These plants were produced outside the Japanese beetle flight season in Japanese beetle-free growing medium or sterilized field soil".

3. Application of Approved Regulatory Treatments.

All pesticide products must be labeled and registered in the state where treatments are applied, and must be used in strict accordance with product labeling instructions and worker protection standards. Nothing in this document is intended to augment or contradict EPA-approved label instructions or Federal worker protection standards. Phytosanitary officials and nursery industry members should verify registration/labeling status before use of a particular product.

Environmental factors, varietal differences, and stage of growth may have significant effects on phytotoxic expression. When using any pesticide, it is recommended that a small group of plants be treated at the recommended rate under the anticipated growing conditions and observed for phytotoxic symptoms for at least seven days before large numbers of plants are treated. Temperature, humidity, dormancy state of the plant, etc. are some factors that could delay the expression of phytotoxicity symptoms. The user of these approved treatments assumes all the risk for any plant losses that occur.

All treatments will be performed under direct supervision of a phytosanitary official or under compliance agreement. Treatments and procedures under a compliance agreement will be monitored closely throughout the season. State phytosanitary certificates listing and verifying the treatment used must be forwarded to the receiving state via fax or electronic mail, as well as accompanying the shipment. The phytosanitary certificate shall bear the following Additional Declaration (AD): *"The rooted plants were treated to control Popillia japonica according to the criteria for shipment to category 1 states as provided in the U.S. Domestic Japanese Beetle Harmonization Plan."*

On an interim basis, additional treatments may be accepted if the proposed product is appropriately labeled, effectively controls Japanese beetle, and is mutually agreeable to the states involved.

3a. Dip Treatment - B&B and Container Plants

Only plants grown in non-clay soil are eligible. This includes non-clay balled and burlapped, potted and containerized nursery stock with rootballs twelve (12) inches in diameter or smaller.

- The potted or balled and burlapped stock will be dipped so as to submerge the entire root ball and all growing media of the container or the root retaining materials into the solution.
- The submersion time will be a minimum of two (2.0) minutes or until complete saturation occurs, as indicated by the cessation of bubbling.
- Upon removal from the solution the plants are drained according to label directions and local laws.

The dip treatment targets Japanese beetle larval stages. Treatment must be applied between September 15 and April 15 in southern states and between September 1 and May 1 in the northern states as determined by the appropriate phytosanitary official.

Growing media must be at least 50° F at the time of treatment. Media should be of moderate moisture content (not too wet or not too dry) so that pesticide will adequately penetrate the medium. Plants should not be shipped before they are well drained and can be easily handled. Treated material must be shipped before beetle flight, or be protected from re-infestation. During the adult flight period all treated plants must be protected from re-infestation.

Approved Chemicals

- **Chlorpyrifos** (4E formulations labeled for dipping, including Dursban 4E-N). Apply chlorpyrifos 4E at a rate of 8 fluid ounces of product (236 mL) per 100 gallons of water.
- **Bifenthrin** (OnyxPro Insecticide). Apply at a rate of 14.4 fluid ounces of product (425 mL) per 100 gallons of water.

3b. Drench Treatments - Container Plants Only

Potting media used must be sterile and soilless, containers must be clean. Containerized nursery stock with rootballs twelve (12) inches in diameter or smaller and consisting of non-clay soil are eligible.

- Field potted plants are **not** eligible for certification using this protocol

This is a prophylactic treatment protocol targeting eggs and first instars (the youngest life stage of Japanese beetle larvae). Treat just before Japanese beetle adult flight season (June 1, or as otherwise determined by the phytosanitary official). Apply tank mix as a drench to wet the entire surface of the potting media. It is recommended to use 1/5 the container volume for this, or a volume as directed by the label. Avoid over drenching to prevent active ingredient loss through leaching. Avoid excessive irrigation following treatment to also reduce leaching of active ingredient. During the adult flight season, plants must be retreated after sixteen (16) weeks if not shipped to assure adequate protection. If the containers are exposed to a second flight season they must be retreated.

Approved Chemicals

- **Imidacloprid** (Marathon 60WP). For 12 inch diameter containers, apply one 20 gram packet to 300 containers using sufficient water to wet the potting medium without loss of liquid through leaching. For directions for treating other container sizes smaller than 12 inch diameter, refer to the insecticide label.
- **Imidacloprid + Cyfluthrin** (Discus N/G). For 12 inch diameter containers, apply 14 fluid ounces of product (414 mL) to 300 containers using sufficient water to uniformly cover the treated area. Optimal control will be achieved with light irrigation following application, but allow no leaching or pot run out for 10 days following application.
- **Bifenthrin** (Talstar S Select Insecticide, OnyxPro Insecticide). For Talstar S Select, mix at the rate of 40 fluid ounces of product per 100 gallons of water. For OnyxPro, mix 14.4 fluid ounces of product (425 mL) per 100 gallons of water. Apply, as a drench, approximately 4 fluid ounces of tank mix per 6 inches of container diameter.
- **Thiamethoxam** (Flagship 25WG). Mix at a rate of 8.5 ounces of product (240 grams) per 100 gallons water. For drench applications made to container substrates, apply sufficient water volume to moisten media around the root zone of the plant without loss from the bottom of the container. Refer to the table in the Flagship label for suggested drench volumes.

3c. Media (Granule) Incorporation - Container Plants Only

Containerized nursery stock with rootballs twelve (12) inches in diameter or smaller and consisting of non-clay soil are eligible.

- Field potted plants are **not** eligible for certification using this protocol

All pesticides used for media incorporation must be mixed thoroughly into the media before potting and plants should be watered at least 2 times following media incorporation before shipment can begin. Potting media used must be sterile and soilless, containers must be free of soil and debris and plants for potting will be free of Japanese beetle. The granules must be incorporated into the media before potting. Plants being stepped up into treated potting media must first have undergone an approved drench or dip treatment to eliminate any untreated volume of potting medium. This treatment protocol targets eggs and early first instar larvae and allows for certification of plants that have been exposed to only one flight season after application. If the containers are to be exposed to a second flight season they must be repotted with a granule incorporated mix or retreated using one of the approved dip or drench treatments.

Approved Chemicals

- **Imidacloprid** (Marathon 1% G). Mix at the rate of 5 pounds of product per cubic yard.
- **Bifenthrin** (Talstar N Granular). Mix at the rate of 25 parts per million (ppm) or 2.5 pounds of product per cubic yard based on a potting medium dry bulk density of 200 pounds per cubic yard. (See definition of bulk density for specifics on how to calculate for media with other bulk densities).

3d. Methyl Bromide Fumigation

Nursery stock: methyl bromide fumigation at NAP, chamber or tarpaulin. See the California Commodity Treatment Manual for authorized schedules.

Many plant cultivars may be severely injured by methyl bromide fumigation. To minimize injury, plants should be free of surface moisture. However, pans of water should be placed around the chamber floor to lower the risk of plant damage. The fumigant should be injected into the chamber as a high-temperature (210°F) vapor and not as a liquid. Foliage should not touch the inner sides of the chamber or enclosure, and should be kept out of the direct air blast from the circulating and exhaust fans. For best results, the nursery stock should be at the temperature of the selected schedule before treatment.

Material treated from October through April must be shipped before beetle flight or be protected from re-infestation. During the adult flight period all treated plants must be protected from re-infestation if they are held before shipment.

4. Detection Survey for Origin Certification

Once Japanese beetle is detected in a state, or a portion of a state, previously not known to be infested, those states, or parts of those states, that are non-infested and that conduct the recommended detection survey program may provide origin certification for growing operations producing regulated host commodities, based on negative detection trapping during the adult flight period. Growing operations certified under this approach must grow all their own stock or be required to receive only nursery stock qualified for entry into category 1 states.

The nursery site and a minimum one mile radius buffer area must be trapped on an annual basis. The growing operation must be trapped at the following trap density:

- For sites consisting of less than 5 acres in size, 3 traps will be used per site.
- For sites of 5 to 30 acres in size, one trap will be used for each 5 acres.
- For sites 30 to 160 acres in size, 1 trap will be used for each 10 acres.
- Sites greater than 160 acres, 8 traps will be used for each 100 acres.

Traps should be evenly spaced throughout the trapping areas. In addition, the surrounding one mile buffer area will be trapped at a minimum of 2 traps placed per square mile.

Traps shall be baited with a lure consisting of a Japanese beetle food lure (phenyl-ethyl proprionate:eugenol: geraniol [3:7:3 ratio]) and male sex pheromone, and renewed as often as necessary to maintain trapping efficacy. The detection of Japanese beetle in an area must prompt either appropriate delimitation and mitigation efforts or a determination of infested status. The trapping of a buffer area around the nursery site will help determine if beetles trapped are actually originating from within the nursery or in the surrounding area.

The phytosanitary certificate shall bear the following Additional Declaration (AD): *The plants were produced in a nursery which was found to be free of Japanese beetle (Popillia japonica) based on negative detection trapping.*

AD's that can be used for shipment of materials to Category 1 States are:

- A. *"The rooted plants (or crowns) were produced in an approved Japanese beetle free greenhouse or screenhouse."*
- B. *"These plants were produced outside the Japanese beetle flight season".*
- C. *"The rooted plants were treated to control Popillia japonica according to the criteria for shipment to category 1 states as provided in the U.S. Domestic Japanese Beetle Harmonization Plan."*

APPENDIX 2.

SHIPMENT TO CATEGORY 2 STATES

Regulated nursery stock from any infested area may be shipped to category 2 states under any certification protocol for shipment to category 1 states, or any **one** of the protocols described in this appendix for shipment to category 2 states.

1. Application of Approved Regulatory Treatments

All pesticide products must be labeled and registered in the state where treatments are applied, and must be used in strict accordance with product labeling instructions and Federal worker protection standards. Nothing in this document is intended to augment or contradict EPA-approved label instructions. Phytosanitary officials and nursery industry members should verify registration/labeling status before using a particular product.

- Environmental factors, varietal differences, and stage of growth may have significant effects on phytotoxic expression. When using any pesticide, it is recommended that a small group of plants be treated at the recommended rate under the anticipated growing conditions and observed for phytotoxic symptoms for at least seven days before large numbers of plants are treated. Temperature, humidity, dormancy state of the plant, etc. are some factors that could delay the expression of phytotoxicity symptoms. The user of these approved treatments assumes all the risk for any plant losses that occur.

All treatments will be performed under regulatory supervision or under compliance agreement. Treatments and procedures under a compliance agreement will be monitored closely throughout the season. A state certificate which lists and verifies the treatment used must accompany shipment with the following (or an equivalent) Additional Declaration (AD): *”The plants were treated to control Japanese beetle according to the criteria for shipment to category 2 states as provided in the U.S. Domestic Japanese Beetle Harmonization Plan.”*

On an interim basis, additional treatments may be accepted if the proposed product effectively controls Japanese beetle and is mutually agreeable to the states involved.

1a. Dip Treatments - B&B and Container Plants

All balled and burlapped, potted and containerized nursery stock with a rootball diameter of 32 inches or smaller are eligible for certification. The potted or balled and burlapped stock will be dipped so as to submerge the entire root ball and all growing media of the container or the root retaining materials into the solution. The submersion time should be a minimum of two (2.0) minutes and until complete saturation occurs, as indicated by the cessation of bubbling. Upon removal from the solution the plants are drained in an approved manner.

Plants should not be shipped before they are well drained and can be easily handled. Media must be at least 50° F at the time of treatment. The dip treatment targets Japanese beetle larval stages. Growing medium should be of moderate moisture content (not too wet or not too dry) so that pesticide will adequately penetrate the medium. Treatment must be applied between September 1 and April 15 in southern states and between September 1 and May 1 in the northern states as determined by the appropriate phytosanitary official. During the adult flight period all treated plants must be protected from re-infestation.

Approved Chemicals

- **Chlorpyrifos** (4E formulations labeled for dipping, including Dursban 4E-N). Apply chlorpyrifos 4E at a rate of 8 fluid ounces of product (236 mL) per 100 gallons of water.
- **Bifenthrin** (OnyxPro Insecticide). Apply at a rate of 14.4 fluid ounces of product (425 mL) per 100 gallons of water.

1b. Pre-Harvest Soil Surface Treatments

Balled & burlapped or field-potted plants, harvested from production fields, should be treated before harvest using a band width six (6) inches wider than the actual root ball diameter to be dug. Do not allow the bands in adjacent rows to overlap. Apply May through July:

Approved Chemicals

- **Imidacloprid** (Marathon 1% G, Marathon 60WP, Mallet 2F T&O Insecticide, Lada 2F Insecticide, Quali-Pro Imidacloprid 2F T&O Insecticide). For Marathon 1% G use 45 ounces of product per 3,000 square feet of treatment area. For Marathon 60WP use one 20 gram packet per 3,000 square feet of treatment area. For Mallet 2F T&O, Lada 2F and Quali-Pro 2F T&O, use 0.6 fluid ounces (17 mL) per 1,000 square feet. Vegetation should be moved to a height of 3 inches or less before application. Irrigation or rainfall must occur within 24 hours after application to move the active ingredient through the thatch. Do not mow until after sufficient irrigation or rainfall has occurred.
- **Imidacloprid + Cyfluthrin** (Discus N/G). Use 17 fluid ounces (502 mL) of product per 3,000 square feet of treatment area. Do not use less than 2 gallons of spray volume per 1,000 square feet. Vegetation should be mowed to a height of 3 inches or less prior to application. Treatment should be followed by rainfall or irrigation.
- **Thiamethoxam** (Flagship 0.22G, Flagship 25WG). For Flagship 0.22G use 120 pounds

- of product per acre. For Flagship 25WG, use 17 ounces of product per acre using a minimum of 1.5 to 5 gallons of water per 1,000 square feet. Irrigate within 1 day of application, do not mow turf until rainfall or irrigation has occurred.

2. Japanese Beetle Nursery Trapping Program

The purpose of the trapping program or delimitation survey is to determine the Japanese beetle status of nursery sites *within* the Japanese beetle generally infested area. Regulated nursery stock produced in nurseries found to be free from Japanese beetle based on the nursery trapping program can be certified for shipment when accompanied by a certificate with the following (or an equivalent) Additional Declaration (AD): *“The plants were produced in a nursery which was found to be free from Japanese beetle (Popillia japonica) based on a nursery trapping program.”*

To be eligible for certification nursery sites must meet the following criteria:

- The Japanese beetle-free zone shall be the nursery site per se. A nursery business may have more than one nursery site. Each site may have an independent regulatory status relative to Japanese beetle. It is the duty and responsibility of the nursery to maintain the integrity of the Japanese beetle free zones at all times.
- To avoid a risk of transshipping Japanese beetle-infested commodities, only commodities certified to be free from Japanese beetle shall be introduced into the nursery.
- The entire nursery site shall be surveyed using a detection trapping survey at the rate of 49 traps per square mile (1 trap per 13 acres). Traps should be evenly spaced throughout the trapping areas. There shall be a minimum of three (3) traps per site regardless of the size of the nursery site. Traps shall be baited with a lure consisting of a Japanese beetle food lure (phenylethyl proprionate:eugenol: geraniol [3:7:3 ratio]) and male sex pheromone, and renewed as often as necessary to maintain trapping efficacy. Traps shall be placed and/or monitored regularly by official regulatory authorities during the period of adult flight. Records shall be maintained of trap monitoring and all Japanese beetle captures.
- The survey shall be conducted annually during the adult flight period.

If **no** beetles are captured in the survey, the nursery site meets the criterion for shipping to pest-free areas. If *one or two beetles* are captured, in total, from all traps set for the delimitation survey, the nursery may maintain its Japanese beetle-free status provided that, in the judgment of the supervising state plant regulatory official, the detection represents an interception rather than

a locally established population of Japanese beetle. Clarification is provided by a further delimitation survey as specified in the Nursery Site Survey for Japanese beetle (see Appendix 3) in the *following* year. If no beetles are captured, in total, from all traps in the delimitation survey following a positive find, the nursery site may be designated as a Japanese beetle-free zone. If more than two beetles are captured, in total, from all traps, the nursery site is considered to be infested with Japanese beetle.

The phytosanitary official in the state of origin is responsible for the oversight and management of trapping efforts performed under this section. Phytosanitary officials are strongly encouraged to work cooperatively with their state's nursery industry to develop trapping programs meeting the standards defined in this plan. Some aspects of this program may be performed by industry as mutually agreed between industry and the phytosanitary official. Cooperating nurseries may be placed under a compliance agreement that documents the responsibilities of all parties. Each specific function of the trapping program should be clearly defined and phytosanitary officials are ultimately responsible for the trapping program's operation.

3. Nursery Accreditation Program

The purpose of this program is to certify plants from nursery sites or individual nursery fields, located *within* an infested area, as posing an acceptably **low** risk of harboring Japanese beetle for states that treat Japanese beetle as a regulated non-quarantine pest.

Under regulatory oversight, nursery operations producing field-grown plants shipped as balled & burlapped or field-potted plants may be certified under either of the two protocols. It is recommended that shipping nurseries be placed under a compliance agreement. Procedures under a compliance agreement will be monitored closely throughout the season by the phytosanitary authority. This compliance agreement should indicate applicable production, treatment and documentation procedures. Plant shipments should be accompanied by a certificate that includes the following (or an equivalent) Additional Declaration (AD): *“The rooted plants (or plant material) are certified in accordance with the Japanese Beetle Nursery Accreditation Program soil sampling (or Japanese Beetle Management Strategy) protocol.”*

3a. Soil Sampling Protocol

Acceptably low levels of Japanese beetle infestation shall be verified by soil surveys conducted at a rate based on acreage to be accredited. All larvae collected must be examined

by a regulatory official to confirm species. Larvae may be forwarded to a specialist for positive identification if species determination cannot be made on-site. Sampling records and maps shall be maintained and made available to plant protection authorities upon request.

Samples should be taken when the majority of larvae are second or third instars (September - May) uniformly and at random throughout the field from within the growing rows of plants that are to be harvested. Specific areas with a higher susceptibility for harboring Japanese beetle grubs should be given additional attention.

When most larvae are near the soil surface (September to October and April to May), samples are taken at a depth of four to six inches. From November to March, samples must be taken to a depth of eight inches. Accreditation cannot be granted if *more than one* Japanese beetle larva is present in any of the samples collected. The following are approved sampling methods using the table below for the number of samples required:

Cup cutter or similar coring device. Soil is sampled using a cup cutter or similar coring device no smaller than 4.25 inches in diameter. These cup cutters are available from golf course supply companies. Random samples should be taken from within growing rows to the recommended depth.

Spade or shovel. Soil is sampled using a spade no smaller than 7-inches wide to extract soil "squares". Random samples should be taken from within growing rows to the recommended depth.

Table 1. Determining Numbers of Soil Samples to Collect		
Block Size (Acres)	Cup Cutter Method	Spade Method
0.1 - 1.0	50	20
1.1 - 5.0	70	30
5.1 - 10.0	80	35
10.1 - 25.0	90	40
25.1 - 50.0	125	50
>50.0	125 plus 2 samples for each additional 10 acres	50 plus 1 sample for each additional 10 acres

3b. Japanese Beetle Management Strategy

This option incorporates production practices that reduce Japanese beetle pest risk, coupled with a less-intensive sampling protocol to assure adequate risk mitigation. Accreditation will not be granted if *more than one* Japanese beetle larva is present in any of the samples collected.

Management practices include all the following:

Maintenance of a weed-free critical zone. (Defined in Appendix 5 as 12-inches beyond the edge of the rootball . A weed-free zone may be established based on mechanical cultivation, use of herbicides capable of killing the above and below-ground portions of weed plants, application of sufficient mulching to prevent weed emergence and growth, use of plastic film or barrier cloth, or use of exclusion techniques such as grow-pot. Weed-free zones must be established before weed establishment and continued throughout the adult flight season. Weeds should be killed when young to minimize presence of organic matter. Areas of the field outside the critical zone may be managed as the grower chooses.

Japanese beetle adult and larval treatments. Application of adult and/or larval pesticide treatments, *as needed*, based on conditions in the participating nursery. While no specific treatments are mandated, several pesticides are registered for nursery usage for Japanese beetle control. Proper application timing is the key to desired efficacy, particularly for larval treatments. Because research efforts are ongoing, and registrations are subject to change, consult state regulatory and extension personnel for specific recommendations.

Soil sampling. Take soil samples as outlined above in Section 3a. (Soil Sampling Protocol); however, reduce the number of samples indicated in Table 1., shown above, by one-half.

Accreditation will not be granted if *more than one* Japanese beetle larva is present in any of the samples collected.

4. Containerized Nursery Stock Accreditation Program

Containerized nursery stock can be certified if grown under **all** of the following conditions.

Ornamental grasses and sedges, which have been identified as preferred hosts of Japanese beetle, will not be allowed certification under this program (see below for a list of plant genera found associated with increased infestation of Japanese beetle). These plants should be accompanied by a certificate including the following (or an equivalent) Additional Declaration (AD): “*The plants have been found to be free from Japanese beetle (Popillia japonica) on the basis of a container accreditation program.*”

Conditions

- Only artificial growing media or sterilized soil shall be used and plants for potting will be free of Japanese beetle.
- Potted plants shall be maintained on a material which serves as a suitable ground barrier for Japanese beetle, i.e. gravel, plastic, hard packed clay, etc.
- Certified lots shall be identified and segregated in a manner satisfactory to the phytosanitary official.
- All containers shall be maintained apparently free of weeds.

The following genera were found to host Japanese beetle larvae during inspection of containers in Michigan during 1993⁴. These plant families and genera are not certifiable under this Containerized Nursery Stock Accreditation Program protocol:

- **Grasses (Poaceae):** *Andropogon, Brizas, Chasmanthium, Deschampsia, Imperata, Koeleria, Panicum, Phalaris, Schizachyrium, Sorghastrum* species and other similar grass species.
- **Sedges (Cyperaceae):** *Carex* species.

5. Shipment of Sod

Sod may be shipped to a category 2 state from sites found to be Japanese beetle-free based on trapping (as with nurseries), or the sod is coming from sites managed to reduce the risk of Japanese beetle infestation. Management activities include:

- Maintenance of a Japanese beetle adulticide program on the sod-farm periphery.
- Removal of Japanese beetle attractive plant species from the immediate growing area (where practical).
- Periodic verification of compliance by regulatory officials.
- Documentation of insecticide treatments with products recognized as providing effective regulatory treatment against Japanese beetle.

Sod shall be inspected in the presence of a regulatory officer to determine its freedom from Japanese beetle at the time of harvest (sod cutting). Category 2 states will accept sod from Japanese beetle infested areas if the sod is inspected and found to be free of Japanese beetle at the time of harvest (sod cutting) **or** if one of the following pesticide treatments are applied when larvae are most susceptible to treatment (avoid mowing turf until after sufficient irrigation or

rainfall has occurred so that uniformity of the application will not be affected). Apply as a curative treatment between April 1 and July 31st. Applications must be followed by sufficient irrigation or rainfall (0.5 to 1 inch) within 24 hours to move the active ingredient through the thatch and into the root zone where grubs feed.

Approved Chemicals

Chlorantraniliprole (Acelepryn, Acelepryn Granular). For Acelepryn, use at a rate of 16 fluid ounces (473 mL) of product per acre. For Acelepryn Granular use 100 pounds of product per acre. Optimal results will be achieved if product is irrigated into turf or rainfall occurs immediately after application.

Clothianidin (Arena 50WDG, Arena 0.25G). For Arena 50WDG, use a rate of 12.8 oz (362 grams) of product per acre. For Arena 0.25G, use 160 pounds of product per acre. For Arena 0.25G, irrigate after application with enough water to dissolve granules and move product into the root zone. Follow applications of Arena with sufficient irrigation or rainfall to move the active ingredient through the thatch. Do not mow turfgrass until after irrigation or rainfall has occurred to allow for uptake and distribution of Arena into soil and turfgrass.

Halofenozide (Mach 2 1.5G, Mach 2 2SC). For Mach 2 1.5G, use 133 pounds of product per acre or 3 pounds of product per 1,000 square feet. For Mach 2 2SC, use a rate of 4 quarts of product per acre or 2.9 fluid ounces (85 mL) of product per 1,000 square feet. Mach 2 is not dependent on immediate irrigation for activation, but under conditions of drought it is recommended to water in Mach 2 to facilitate transport of material through the thatch. Allow 7 days between application and harvest of sod. Do not mow turf before product is washed off of the leaf blades.

Imidacloprid (Merit 75 WP, Merit 75 WSP, Merit 2F, Mallet 2F T&O Insecticide, Lada 2F Insecticide, Quali-Pro Imidacloprid 2F T&O Insecticide). For Merit 75 WP use a rate of 8.6 ounces of product (243 grams) per acre or 4 level teaspoons per 1,000 square feet. For Merit 75 WSP use 1.6 ounces (1 packet) per 8,250 square feet. For Merit 2F, Mallet 2F T&O, Lada 2F and Quali-Pro 2F T&O, use at a rate of 1.6 pints (757 mL) per acre or 0.6 fluid ounces per 1000 square feet. For optimal control, irrigate immediately after application to move the active ingredient through the thatch, or apply product during or immediately preceding a significant rain event. Do not mow turf until after sufficient irrigation or rainfall has occurred so that the uniformity of application will not be affected.

Thiamethoxam (Meridian 0.33G, Meridian 25WG). For Meridian 0.33G, use a rate of 80 pounds of product (2 bags) per acre or 9 pounds of product per 5,000 square feet. For Meridian 25WG use 17 ounces of product per acre or 4 ounces per 10,000 square feet. Maintain adequate

soil moisture before and after application for optimal control. Excessive wet or dry conditions may impact Meridian performance against Japanese beetle grubs. Irrigate within 7 days of application to move Meridian 0.33G or 25WG into the root zone where grubs feed. Do not mow turf until treated area has been irrigated or rainfall has occurred to allow for maximum and uniform uptake into the turfgrass or soil.

A state certificate listing and verifying the treatment used must accompany shipment of sod with the following (or an equivalent) Additional Declaration (AD): *“The sod was treated to control Japanese beetle according to the criteria for shipment to category 2 states as provided in the U.S. Domestic Japanese Beetle Harmonization Plan”.*

⁴ Container Inspection for Japanese Beetle: A New Approach to Certification, by D. R. Smitley.

APPENDIX 3:

Shipment into Canada from the United States

(Canadian Food Inspection Agency, CFIA D-96-15)

- A Permit to Import is not required under this directive. However, a Permit to Import may be required under the *Plant Protection Regulations* for commodities with additional phytosanitary requirements (if specified in other directives).
- Additional information can be obtained from the following website:
<http://www.inspection.gc.ca/english/agen/agene.shtml>
- CFIA has no JB-specific requirements for material moving from a Category 1, 2, 3, or 4 State to a Category 3 or 4 province/territory

Requirements for Movement of Nursery Stock from a State Listed as:

1) *Category 1* into a Province/Territory listed as Category 1 or Category 2

- Phytosanitary Certificate indicating the state of origin, USGCP label or USNCP certificate

2) *Category 2, 3, or 4* into a Province/Territory listed as Category 1

2.1. Plants must be:

- Produced in an approved JB-free greenhouse/screen house; **or**
- Treated for JB in accordance with the U.S. Domestic Japanese beetle Harmonization Plan; **or**
- Produced outside the JB flight season; **or**
- Produced in a JB free area

2.2. The shipment must be authorized by the CFIA and may be inspected by a CFIA inspector before being released.

2.3. The plants must be accompanied by:

- A USGCP label; **or**
- A USNCP certificate; **or**
- A Phytosanitary Certificate listing the following additional declaration – *The plant material meets the Japanese beetle requirements of Canada for Category 1 areas as described in directive D-96-15*

Nursery Products from a Category 2, 3, or 4 State which are **not** allowed into a Category 1 Province/Territory:

- Sod
- Balled and burlapped, potted and/or containerized plants which have been treated by dipping using an approved pesticide for the eradication of JB will not be allowed if the rootballs are over 30 cm (12 inches in diameter)
- Potted and/or containerized plants which have been treated by drenching using an approved pesticide for the eradication of JB will not be allowed if the rootballs are over 30 cm (12 inches in diameter)
- Plant material from the U.S. Japanese Beetle Containerized Nursery Stock Accreditation Program, the U.S. Japanese Beetle Nursery Accreditation Program or the Japanese Beetle Management Strategy

3) *Category 2, 3, or 4* into a Province/Territory listed as Category 2

3.1. Plants must be:

- Produced in an approved JB-free greenhouse/screen house; **or**
- Certified in accordance with the U.S. Japanese Beetle Nursery Accreditation Program soil sampling (or Japanese Beetle Management Strategy) protocol; **or**
- Certified in accordance with the U.S. Japanese Containerized Nursery Stock Accreditation Program; **or**
- Treated for JB in accordance with the U.S. Domestic Japanese beetle Harmonization Plan; **or**
- Produced outside the JB flight season; **or**
- Produced in a JB free area

3.2. The shipment must be authorized by the CFIA and may be inspected by a CFIA inspector before being released.

3.3. The plants must be accompanied by:

- A USGCP label; **or**
- A USNCP certificate; **or**
- A Phytosanitary Certificate listing the following additional declaration – *The plant material meets the Japanese beetle requirements of Canada for Category 2 areas as described in directive D-96-15*

Nursery Products from a Category 2, 3, or 4 State which are **not** allowed into a Category 2 Province/Territory:

- Balled and burlapped, potted and/or containerized plants which have been treated by dipping using an approved pesticide for the eradication of JB will not be allowed if the rootballs are over 81 cm (32 inches in diameter)
- Potted and/or containerized plants which have been treated by drenching using an approved pesticide for the eradication of JB will not be allowed if the rootballs are over 30 cm (12 inches in diameter)

APPENDIX 4. STATEWIDE DETECTION SURVEY (TRAPPING)

1. Detection Program for States with Japanese Beetle Quarantines

States that take quarantine action against Japanese beetle must also have a pest prevention program to detect and facilitate eradication of any introduced population. To maintain status as a category 1 state under this plan, a state must conduct an approved detection-trapping program annually during the adult flight period that consists of two traps per square mile throughout the residential and rural/residential areas that are susceptible to Japanese beetle introduction and establishment.

To facilitate eradication and to more precisely pinpoint the infested area, delimitation trapping should be initiated upon the detection of a single adult. For delimitation, trap density is increased to 49 traps per square mile within one square mile around the adult find. The trap density for the contiguous square miles is 25 per square mile, then 5 per square mile for an additional 2 miles (see Figure 1. below). Although this is the recommended density, higher trapping densities may be used, if desired. Traps should be evenly spaced throughout the survey areas.

Figure 1. Delimitation trapping scheme to facilitate eradication.

5	5	5	5	5	5	5
5	5	5	5	5	5	5
5	5	2	2	2	5	5
5	5	5	4	2	5	5
5	5	5	9	5	5	5
5	5	2	2	2	5	5
5	5	5	5	5	5	5
5	5	5	5	5	5	5

Each square represents one square mile. Numbers indicate quantity of traps to be placed per square mile. The center square represents the epicenter of detection. Total trapping area is forty-nine (49) square miles consisting of 449 traps.

An area is considered infested if multiple Japanese beetles are trapped within one square mile in one year, or if delimitation surveys detect an alternate life stage, e.g., larvae, or if Japanese beetle is trapped in the same area in second or successive years. Any area not annually monitored for

the presence of Japanese beetle can be considered infested once Japanese beetle is detected. An infested area will retain its infested status until eradication efforts have resulted in two subsequent and consecutive years of negative trap surveys conducted at the delimitation level after the last eradication treatment has been applied.

The following AD's for shipment of nursery stock into Category 2 states are:

A. The plants were treated to control Japanese beetle according to the criteria for shipment to category 2 states as provided in the U.S. Domestic Japanese Beetle Harmonization Plan.

B. The plants were produced in a nursery which was found to be free from Japanese beetle (Popillia japonica) based on a nursery trapping program.

C. The rooted plants (or plant material) are certified in accordance with the Japanese Beetle Nursery Accreditation Program soil sampling (or Japanese Beetle Management Strategy) protocol.

For Sod shipments:

AD - The sod was treated to control Japanese beetle according to the criteria for shipment to category 2 states as provided in the U.S. Domestic Japanese Beetle Harmonization Plan.

2. Detection Program for Non-Infested States without Japanese Beetle Quarantines

Those states that remain non-infested but consider Japanese beetle a regulated non-quarantine pest must conduct a detection program to verify its continued absence. In this case traps should be placed in areas favorable for the introduction and establishment of Japanese beetle. Minimally, traps should be placed and monitored annually during the adult flight period at a rate of 1 trap per two square miles placed in areas susceptible to Japanese beetle introduction and establishment. Any area not annually monitored for the presence of Japanese beetle may be considered infested once Japanese beetle is detected. Any detection of Japanese beetle should prompt an investigation into the possible source of introduction and the placement of additional traps. If Japanese beetle is trapped at the same location the following year, delimitation surveys at the protocol rate detailed above for quarantine states and any other mitigation action determined necessary must be undertaken to retain Japanese beetle free status at the state or county level.

A state or county will be considered infested if no delimitation or mitigation action is taken; or if Japanese beetle continues to be detected during the third year.

The area will be considered infested until eradication efforts have resulted in two subsequent and consecutive years of negative surveys conducted at the delimitation survey level.

3. Nursery Site Survey for Japanese Beetle

States may wish to conduct detection trapping specifically around facilities receiving host commodities or means of conveyance from infested areas. The primary purpose for such a trapping program would be to monitor the effectiveness of risk mitigation measures applied at origin.

For such monitoring purposes, the recommended trap density will be 1 trap per acre of imported nursery stock with a minimum of 3 traps per site; or, if the imported stock is distributed throughout the nursery site, one trap at each individual site where the stock is being held. However, it is suggested that the states not rely solely on trapping such establishments for the purpose of tracking infestation status. It is also important that states periodically monitor some landscape installations to assess the risk of mitigation applied at origin.

APPENDIX 5.

BIOLOGY AND PEST RISK ANALYSIS

1. Biology

Japanese beetle, *Popillia japonica* Newman, is native to the main island of Japan. It was first found in the United States in 1916 in a nursery near Riverton, New Jersey. As of 2007, the beetle is now generally established in most of eastern North America from Southern Ontario, Canada south to north Georgia and west past the Mississippi River. Adult Japanese beetle feed on the foliage, flowers, and fruits of hundreds of different plants while the larvae feed on plant roots. It is an economic pest of turf, pastures, fruit trees and ornamental plantings.

Japanese beetle is univoltine, that is it requires one year to complete its life cycle in most parts of its range. Depending upon latitude and weather, adult beetles emerge from the soil to mate and feed as early as mid-May in warmer areas and as late as July in colder climates. Males emerge a few days before the females. Emerging females are sexually mature, carry an average of 20 eggs, and begin to oviposit immediately after mating.

Oviposition sites are usually selected on the basis of proximity to feeding sites, ground cover, and condition of the soil. Oviposition usually occurs near the area where the female has been feeding, preferably on grass covered soil and soil moist enough to prevent egg desiccation and loose enough to allow digging. Female beetles burrow into the soil and deposit one to three eggs at a time at a depth of two to four inches. Each female may produce 40 to 60 eggs in a lifetime; eggs hatch within two weeks of oviposition.

After hatching, larvae begin feeding on nearby rootlets and continue feeding until the rootlet is consumed. Larvae then move horizontally until a new rootlet is found. As soil temperatures cool in the fall, larvae move deeper into the soil. All activity ceases when temperatures reach about 10°C (50°F) with most larvae overwintering as third instars. When soil temperatures warm in the spring, larvae move upward again and feed for a time before entering an inactive prepupal condition. Since the species is adapted to develop in moist soil, Japanese beetle eggs must absorb water to successfully complete embryonic development. As a result, if there is not sufficient moisture in the soil, the eggs will die. The optimum temperature for incubation is approximately 30°C (86°F). Japanese beetle eggs are not cold hardy. In general, Japanese beetle develops from egg to adult at temperatures between 17.5°C (63.7°F) and 27.5°C (82°F).

Feeding damage to turf that is well maintained is usually not obvious until the density of larvae exceeds 10 per sq. ft; in poorly maintained turf the damage threshold is lower. Pupation occurs after about ten days and lasts eight to 20 days before adult emergence. Newly emerged beetles

prefer low growing plants for the first few days, then switch to fruit and shade trees for the next several weeks, then return to the low growing plants. Although Japanese beetle has been recorded feeding on 435 plant species, of these only 47 are frequent hosts. Some of the preferred hosts for adult Japanese beetle are Japanese maple, soybean, apple, crabapple, cherry, nectarine, roses, grapes, and corn. The weedy plant smartweed (*Polygonum* spp.) is also a preferred host.⁵

The main factors affecting the natural spread of Japanese beetle, besides availability of food and oviposition sites, are topography, temperature, rainfall, and wind. Assuming adequate soil moisture, when extensive areas of flat farming land are present, Japanese beetle spreads rapidly. However, mountainous areas or forests slow migration. Japanese beetle eggs and larvae in the soil are susceptible to desiccation. For survival, there must be rainfall or irrigation through-out the year of at least 10 inches. In the summer the soil temperature must be between 17.5°C (63.5°F) and 27.5°C (82°F) for development and survival. In winter, soil temperatures colder than -9.4°C (15°F) cause larval mortality. Snow cover helps to thermally insulate the soil and prevents mortality. The spread of Japanese beetle along its leading edge has been variously estimated to be between two to 15 miles per year. Predictions regarding the future spread of Japanese beetle have been based primarily on these temperature and rainfall requirements.

2. Pest Risk Analysis

The National Plant Board Plant Quarantine, Nursery Inspection, and Certification (PQNIC) Guidelines provide the blueprint for standardizing plant pest regulatory strategies through the use of pest risk assessment. This harmonization plan employs these PQNIC guidelines by suggesting that pest status be determined as follows:

- It is reasonable to consider Japanese beetle as a quarantine pest in those states where it is not yet established where the environment is suitable for establishment, where it is not imminently expected to migrate naturally and where it is anticipated to have a harmful impact.
- An assessment of non-quarantine status is supported where Japanese beetle is not expected to have a harmful impact or is anticipated to enter and establish via natural spread. Where Japanese beetle is anticipated to migrate, establish naturally, and become a pest, it supports and encourages a regulatory strategy that will mitigate the artificial spread of Japanese beetle and affirm non-infested status without necessitating a formal quarantine.
- Uninfested status requires support by scientific evidence, and, where necessary to maintain that status, official programs are to be maintained (trapping or other survey).

⁵Dahlsten and Garcia, Eradication of Exotic Pests: Analysis with Case Histories. Yale University Press, 1989.

The PQNIC Guidelines outline a pest risk assessment process for determining whether a pest may be appropriately considered a quarantine pest based upon criteria found within the National Plant Board Principles of Plant Quarantine. Fundamentally, a quarantine pest determination should meet the following criteria:

The pest would be expected to cause significant harm;

- It is likely to be transported into or already exists in the endangered area and is being or would be officially controlled;
- The pest could survive in the endangered area;
- Pest risk cannot be reduced to an acceptable level by means other than phytosanitary (quarantine) measures.

The PQNIC Guidelines also recognize that states may establish commodity entry standards for non-quarantine pests. Such pest standards generally involve a potentially broader array of growing practices, inspection, and/or treatment protocols, in order to meet a less stringent pest freedom standard than a formal quarantine.

The Japanese beetle continues to migrate within its predictable natural ecological range. Continued natural spread to contiguous areas is predicted and not preventable. Environments with intensively-managed habitat, such as urban areas with lawns, may expand the area favorable for localized establishment. Artificial spread to such areas may occur via movement of people, vehicles, and host commodities.⁶

Areas of Japanese beetle favorable habitat exist outside the range of its predicted natural spread. Essential components of effective and defensible quarantines, or other regulatory action within such areas, include detection trapping and eradication of any localized infestations, and regulation of host commodities to maintain Japanese beetle-free status.

In view of the above, this plan allows for more stringent (quarantine) pest risk mitigation measures for nursery stock destined for areas where the risk of natural spread is minimal. For other areas, it recommends a broader array of risk mitigation measures designed to reduce Japanese beetle pest risk to an acceptable level (as a regulated non-quarantine pest). While states retain the right to choose an acceptable level of risk different from that encouraged in this plan, such a decision should be supported by a pest risk analysis that is made available for review on request.

⁶Fleming, Walter E., Biology of Japanese Beetle, Technical Bull. No. 1449. USDA/ARS, July, 1972.

APPENDIX 6. DEFINITIONS

Additional Declaration (AD) - A specific statement concerning Japanese beetle required on the phytosanitary certificate: IHP, 1996. Some states use Certificates of Quarantine Compliance (CQC) as an alternative.

Approved Japanese Beetle-Free Greenhouse or Screenhouse - A named greenhouse or screenhouse identified and approved by phytosanitary officials to be a Japanese beetle-free zone/premises by virtue of meeting all criteria or requirements outlined under Criteria for Approved Japanese beetle-free Greenhouses and Screenhouses. IHP, 1994.

Area - Any political division or subdivision or any officially defined area including adjacent parts of contiguous political divisions or subdivisions. [Political divisions include nations and states or provinces within them. Political subdivisions include counties, parishes, cities or municipalities. Officially defined areas also may include any other clearly defined and identifiable area including a specific property or facility.].

Attractant or Lure - Any of the commercially available Japanese beetle baits that consist primarily of phenyl-ethyl propionate:eugenol:geraniol in a 3:7:3 ratio, usually deployed with the sex attractant pheromone for best effect.

Bareroot - Plants with less than that amount of soil (non visible) that can harbor any Japanese beetle life stage (egg, pupa, or larva). Less than ½ “dirt clods.

Bulk Density -The dry weight of a cubic yard of potting media. A formula for determining pounds of granular formulation per cubic yard of media for a 25 ppm dose rate is as follows:

Multiply media bulk density (in pounds) x 0.000025. Divide the result by the active ingredient concentration of the selected pesticide (for Talstar Nursery Granular, divide by 0.002; for Fireban 1.5 G, divide by 0.015). The result equals pounds of granular formulation needed to treat one cubic yard of growing media.

- Example: Assume that potting media weighing 500 pounds per cubic yard is treated with Talstar Nursery Granular (500 x 0.000025) = 0.0125 divided by 0.002 = 6.25 pounds Talstar per cubic yard.

Talstar and Fireban labels also provide tables and formulas for determining amount of pesticide to be blended into the potting media.

Certificate - A document authorized or prepared by a duly authorized federal or State Plant Regulatory Official that affirms, declares, or verifies that an article, nursery stock, plant product, shipment or any other officially regulated item meets phytosanitary (quarantine), nursery inspection, pest freedom, plant registration or certification, or any other set of legal requirements. Such documents are known by the purpose of their issuance:

Phytosanitary Certificate - for the purpose of verifying compliance with phytosanitary (quarantine) requirements.

Nursery Stock Certificate - for the purpose of verifying compliance with nursery inspection and pest freedom standards.

Registration or Certification Tags, Seals, etc. - for the purpose of verifying compliance with registration or certification requirements; etc. National Plant Board, 1995.

Complete Saturation - The complete saturation of soil during a dip treatment of nursery stock with an approved insecticide treatment. Complete saturation requires a minimum of 2 minutes of immersion in the solution and typically occurs when bubbling ceases from the root ball. It may require more than 2 minutes to achieve complete saturation.

County or Parish - A legally defined territorial subdivision of a state or commonwealth.

Critical Zone - That area of the field that occupies the intended rootball size of the nursery stock plus 12-inches on all sides. For example, if the intended rootball size is 24-inches, plus the 12inch buffer on both sides of the rootball, then the critical zone will be the 16 square feet immediately surrounding the plant.

Delimitation(ing) Survey - A systematic search to determine the extent of an area infested by, or free from, a target pest. NPB, 1995.

Detection Survey - A survey conducted in areas not known to be infested with Japanese beetle in order to detect potential new infestations and to support an area's Japanese beetle-free status. CHP, 1996.

Field - A plot of land with defined boundaries within a place of production on which a commodity is grown. FAO, 1990.

Field Potted Plants - Plants field-grown in soil, then dug and placed with attached soil and possibly additional media into a pot.

Host Commodities - Soil, humus, compost, manure, mulch, plant litter separately or with other items; all plants with roots; grass sod; plant crowns or roots for propagation; bulbs, corms, tubers and rhizomes (of ornamental plants); any other plant, plant part, article or means of conveyance as determined by an inspector, to present a hazard of spreading live Japanese beetle either because of infestation or exposure to infestation by Japanese beetle.

Infested - Officially determined to be contaminated by a pest using prescribed methods. NPB, 1995.

Nursery Site or Nursery - Any location where nursery stock is grown, propagated, stored, or sold; or any location from which nursery stock is distributed direct to a customer. ("Sales location"). NPB, 1995.

Nursery Stock - Any plant for planting, propagation, or ornamentation. NPB, 1995.

Official - Authorized, implemented and directed, or performed by a governmental plant protection organization. NPB, 1995.

Officially Controlled - The conduct, by an official public pest prevention agency, of eradication or intensive suppression activity including various treatments, quarantine and other measures with the goal of eliminating an isolated infestation or prevention of further spread within the endangered area. It does not include private general agricultural, urban forestry, or home garden pest control measures conducted by individuals against pests permanently established in an endangered area. NPB, 1995.

Pest-Free Area - An area kept free from a specific pest. NPB, 1995.

Pest Risk Analysis - Characterizing the nature of pest hazard or harm; identifying the degree of probability or likelihood of harm; analyzing the degree to which risk mitigation measures or strategies can reduce the probability or harm to an acceptable level; and recommending pest risk mitigation measures or strategies. NPB, 1995.

Phytosanitary - A term meaning that an article(s) is apparently free of any weed, plant infesting or plant disease causing agent.

Quarantine Pest - An economically important pest that does not occur in an endangered area, or which is being officially controlled in an endangered area, and for which economic impact cannot be reduced to an acceptable level by means other than phytosanitary measures. NPB, 1995.

Regulated Non-quarantine Pest - A non-quarantine pest whose presence in plants affects the intended use of those plants with an economically unacceptable impact, and which is therefore regulated within the territory of the importing state.

Sales Location - Every location from which nursery stock is delivered direct to a customer. NPB, 1995.

Soil - Soil includes growing media in which plants are normally rooted and which is capable of supporting any life forms of Japanese beetle. Solid rooting materials (e.g. "Oasis Strips" and "Rubber Dirt") and agar or other recognized tissue culture medium, are not considered soil for the purpose of this agreement. To be regulated, soil must include a large enough volume of material to conceal or sustain Japanese beetle life forms.

Sterilized Media – Media sterilized by steam heat to a temperature of 120° F for at least 15 minutes.

Survey - The systematic search for pests in accordance with mutually agreed upon methods designed to assure confidence in their meaning and accuracy for pest prevention purposes such as control, suppression, eradication, verification of pest free areas, identification of possible harm, evaluation of probability of harm, and taking appropriate actions to prevent predicted significant harm. Surveys may be performed for the purposes of detection, delimitation, or verification. NPB, 1995.

APPENDIX 7. LIST OF INFESTED/NON-INFESTED DOMESTIC AREAS

This list of Japanese beetle-infested areas (and the list of partially infested areas in Appendix 8) will be updated regularly by the Japanese Beetle Survey Committee.

INFESTED STATES						
STATE		Category		STATE		Category
*	Alabama	AL	2	Vermont	VT	3
*	Arkansas	AR	2	Virginia	VA	3
*	Colorado	CO	2 ***	West Virginia	WV	3
	Connecticut	CT	3	Wisconsin	WI	3
	Delaware	DE	3	NON-INFESTED STATES		
	District of Columbia	DC	3	STATE		Category
	Georgia	GA	3	Alaska	AK	2
	Illinois	IL	3	Arizona	AZ	1
	Indiana	IN	3	California	CA	1 ***
	Iowa	IA	3	Florida	FL	4
*	Kansas	KS	2	Hawaii	HI	1
	Kentucky	KY	3	Idaho	ID	1 ***
	Maine	ME	3	Louisiana	LA	4
	Maryland	MD	3	Montana	MT	1***
	Massachusetts	MA	3	Nevada	NV	1 ***
	Michigan	MI	3	New Mexico	NM	2
	Minnesota	MN	3	North Dakota	ND	2
*	Mississippi	MS	2	Oregon	OR	1 ***
	Missouri	MO	3	** Utah	UT	1 ***
*	Nebraska	NE	2	Washington	WA	1 ***
	New Hampshire	NH	3	Wyoming	WY	4
	New Jersey	NJ	3			
	New York	NY	3			
	North Carolina	NC	3			
	Ohio	OH	3			
*	Oklahoma	OK	2			
	Pennsylvania	PA	3			
	Rhode Island	RI	3			
	South Carolina	SC	3			
*	South Dakota	SD	2			
	Tennessee	TN	3			
*	Texas	TX	2			
* Only partially infested				** Detected by survey, but not confirmed infested.		
*** State requires advanced notification of shipment.				**** Under active eradication		

APPENDIX 8. PARTIALLY INFESTED STATES/INFESTED COUNTIES

States considered to be only partially infested with Japanese beetle. “Non-infested counties” include those counties undergoing Japanese beetle eradication or official control efforts.

STATE		INFESTED COUNTIES	NON-INFESTED COUNTIES
Alabama	AL	Autauga, Bibb, Blount, Bullock, Calhoun, Chambers, Cherokee, Chilton, Clay, Cleburne, Colbert, Conecuh, Coosa, Cullman, DeKalb, Elmore, Etowah, Fayette, Franklin, Greene, Houston, Jackson, Jefferson, Lamar, Lauderdale, Lawrence, Lee, Limestone, Lowndes, Macon, Madison, Marion, Marshall, Montgomery, Morgan, Pickens, Randolph, Saint Clair, Shelby, Talladega, Tallapoosa, Tuscaloosa, Walker, Winston	All other counties
Arkansas	AR	Benton, Washington	All other counties
Colorado	CO	Arapahoe, Boulder, Denver, Jefferson, Pueblo	All other counties
Kansas	KS	Cherokee, Crawford, Johnson, Pratt, Sedgwick, Shawnee, Wyandotte	All other counties
Mississippi	MS	Adams, Alcorn, Bolivar, Calhoun, Claiborne, Clay, DeSoto, Forrest, George, Grenada, Lafayette, Lamar, Lauderdale, Lee, Leflore, Lowndes, Madison, Marion, Monroe, Panola, Pike, Pontotoc, Prentiss, Rankin, Simpson, Sunflower, Tate, Tippah, Tishomingo, Tunica, Union, Warren, Wayne, Wilkerson, Winston	All other counties
Nebraska	NE	Adams, Buffalo, Burt, Cass, Dakota, Dawson, Dodge, Douglas, Gage, Hall, Hamilton, Jefferson, Lancaster, Lincoln, Madison, Merrick, Otoe, Phelps, Platte, Saline, Sarpy, Saunders, Seward, Thayer, Washington, Wayne, and York	All other counties
Oklahoma	OK	Cherokee, Cleveland, Delaware, Kay, Muskogee, Oklahoma, Osage, Tulsa	All other counties
South Dakota	SD	Lincoln, Minnehaha, Union	All other counties
Texas	TX	Collin, Dallas, Harris, Tarrant, Van Zandt	All other counties