U.S. Domestic

Japanese Beetle

Harmonization Plan

Adopted by the
National Plant Board
August 19, 1998
Last Revision June 20, 2016

Joe Collins
President
National Plant Board

Osama El-Lissy
Deputy Administrator
Plant Protection and Quarantine
Animal and Plant Health Inspection Service
United States Department of Agriculture

Craig Regelbrugge
Senior Vice President - Industry Advocacy & Research
AmericanHort

TABLE OF CONTENTS

EXECTIVE SUMMARY 1

I. GOALS AND BACKGROUND 1

II. CRITERIA FOR DETERMINING JAPANESE BEETLE INFESTATION STATUS 2

III. DEFINITIONS 3

IV. REGULATORY STRATEGIES 3

Category 1 - Uninfested/Quarantine Pest 3
Category 2 – Uninfested or Partially Infested 4
Category 3 – Partially or Generally Infested 4
Category 4 –Not Known To Be Infested/Unlikely To Become Established 4

V. HARMONIZATION PLAN COMMITTEES AND MEMBERSHIP 5

VI. HARMONIZATION PLAN MODIFICATIONS 5

VII. REGULATORY TREATMENT REQUIREMENTS AND PESTICIDE DISCLAIMERS 6

APPENDIX 1. SHIPMENT TO CATEGORY 1 STATES 7
Certification Options 1-4
1. Production in an Approved Japanese Beetle Free Greenhouse/Screenhouse 7
2. Production During a Pest Free Window 7
3. Application of Approved Regulatory Treatments 8
4. Detection Survey for Origin Certification 10
Adult Japanese Beetle Mitigation Requirements 11

APPENDIX 2. SHIPMENT TO CATEGORY 2 STATES 14
Certification Options 1-5
1. Application of Approved Regulatory Treatments 14
2. Japanese Beetle Nursery Trapping Program 15
3. Field Grown Nursery Stock Accreditation Program 16
4. Containerized Nursery Stock Accreditation Program 17
5. Shipment of Sod 18
Adult Japanese Beetle Mitigation Requirements 18

APPENDIX 3: SHIPMENT INTO CANADA FROM THE UNITED STATES 21
APPENDIX 4: STATEWIDE DETECTION & DELIMITING SURVEY 23
APPENDIX 5. BIOLOGY AND PEST RISK ANALYSIS 25
APPENDIX 6. JAPANESE BEETLE PREFERRED HOSTS 27
APPENDIX 7. ANNUAL STATE SURVEY RESULTS FORM 28
APPENDIX 8. LIST OF INFESTED/NON-INFESTED DOMESTIC AREAS 30
APPENDIX 9. PARTIALLY INFESTED STATES/INFESTED COUNTIES 32
APPENDIX 10. EXAMPLE COMPLIANCE AGREEMENT 33
APPENDIX 11. TREATMENT TABLES 38
APPENDIX 12. DEFINITIONS 39
APPENDIX 13. REFERENCES 43

EXECUTIVE SUMMARY

The Japanese beetle is a highly destructive plant pest that can be very difficult and expensive to control. Feeding on grass roots, Japanese beetle grubs damage lawns, golf courses, and pastures. Japanese beetle adults attack the foliage, flowers, or fruits of more than 300 different ornamental and agricultural plants.

Japanese beetles were first found in the United States in 1916 near Riverton, New Jersey. Since then Japanese beetles have spread throughout most states east of the Mississippi River. However, partial infestations also occur west of the Mississippi River.

APHIS maintains the federal Japanese Beetle Quarantine and Regulations, which can be found in 7 CFR 301.48. The objective of the federal Japanese Beetle Quarantine is to protect the agriculture of the Western United States and prevent the human-assisted spread of the beetle from the Eastern U.S. The federal quarantine is designed to reduce artificial spread of Japanese beetles by aircraft. The Western states protected by the Japanese Beetle Quarantine are: Arizona, California, Colorado, Idaho, Montana, Nevada, Oregon, Utah, and Washington.

The federal quarantine addresses the threat of Japanese beetle moving in aircraft, but does not address the movement on or in plants and plant material. The National Japanese Beetle Harmonization Plan was developed by the National Plant Board as a framework to protect uninfested states, while providing shippers consistent, easy to understand certification requirements. The first version went into effect on August 19, 1998. Revisions were approved in June 2004 and March 2016.

I. GOALS AND BACKGROUND

The USDA, the National Plant Board and the regulated industry support the continuing harmonization of Japanese beetle 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 current 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. 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.

This Harmonization Plan is not a federal quarantine, does not override individual state regulations, and will not preclude a legally established quarantine or regulation, or regulatory action taken 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. It is also recognized that specific circumstances may afford additional options, which could be used if acceptable to both the shipping and receiving states. 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.
- Producers and distributors of plants for planting and any other entities involved in the shipment of regulated host commodities from Japanese beetle-infested areas are responsible for understanding and complying with Japanese beetle certification requirements of destination states.
- Special care will be taken when brokering or transshipping plant material to ensure that regulated articles either meet requirements of the ultimate destination at the time they leave the state of origin, or are treated or otherwise handled at any intermediate destination(s) so as to meet destination state requirements. http://nationalplantboard.org/laws-and-regulations/

Concepts fundamental to harmonization are:

- Quarantine regulations and certification requirements 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 regulated articles 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 regulated articles moving to states that consider Japanese beetle a quarantine pest.
- A state phytosanitary certificate or equivalent documentation attesting to compliance with this harmonization plan will accompany regulated articles 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 regulated articles in accordance with any applicable protocol found within this harmonization plan. States that take proactive action to ascertain and track the status of Japanese beetle once it is detected may 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 political subdivision 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), with the exception of Category 4 states. Detection surveys are conducted to detect pest populations or verify freedom from infestation. Delimitation surveys are conducted to determine the boundaries of an 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; or
- 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.

States that do not conduct official monitoring surveys for Japanese beetle will be considered generally infested.

Where recommended delimitation and eradicative measures are conducted and appropriate regulatory action is taken, the regulated political subdivision may be considered smaller than a county or parish jurisdiction.

A political subdivision will be considered infested if no delimitation or mitigation action is taken once Japanese beetle is detected, or after two consecutive years of detections.

An infested area will retain its infested status until eradication efforts have resulted in two subsequent and consecutive years of negative trapping surveys conducted at the delimitation level after the last eradicative treatment has been applied. Documentation of a successful eradication effort may result in the status of a political subdivision returning to uninfested. Documentation must be presented to the JBHP Survey Committee for review.

III. DEFINITIONS

Definitions of terms and words used in this plan are listed and defined alphabetically in Appendix 12. In the interest of consistency, applicable definitions from the National Plant Board[1], 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. Certification of nursery stock/plants for planting that do not fit within typical production methods included in this plan must be approved by the receiving state prior to shipment. An example of a non-typical product may be live plants grown as green roof mats.

This plan provides four Japanese beetle regulatory strategies based on a state's pest classification as listed in Appendix 8. 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 (See Appendix 4), **and**
- There is risk of entry via artificial means, natural spread from an infested area is not imminent nor 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

- 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, **or**
- State has officially adopted and maintains a quarantine to prevent the entry of Japanese beetle.

Category 3 – Partially or Generally Infested

- 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, **and**
- Commodity movement within Category 3 areas is consistent with nursery certification programs designed to minimize the artificial movement of plant pests.

Category 4 – Historically Not Known To Be Infested/Unlikely to Become Established

- 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.

It should be noted that regulated articles shipped from Category 4 areas to Category 1 or 2 destinations may require additional certification for those destinations.

Areas in this Category are characterized by environmental factors that prevent the establishment of Japanese beetle and by the decisions of regulatory officials to take no official control if the beetle is detected in the area. Environmental factors prevent the establishment either through direct lethality to the larvae or widespread occurrence of areas unsuitable for oviposition. The environmental factors include insufficient soil moisture prior to or during oviposition, prolonged periods of high soil temperature or prolonged cold soil temperatures. In these Japanese beetle inhospitable areas, the beetle fails to successfully colonize and establish reproducing populations; whether due to natural movement from adjacent infested areas or due to artificial spread through movement of infested plants and soil.

Insufficient soil moisture prior to oviposition effectively makes a site less attractive to female beetles as oviposition sites. Potter and Held (2002) indicated that females typically lay eggs in areas of moderate to high soil moisture, sunlight and short grass cover. The ideal site is irrigated manicured turf as found in lawns and golf courses. High soil temperatures during the summer months of June, July and August, when Japanese beetle are in the early instars of development have been shown to be lethal when soil temperatures exceed 32°C (93.2^{o}F). Similarly prolonged periods of cold soil temperatures below -10°C (14°F) during winter months adversely affects survival of larvae.

Category 4 areas typically have included areas in the southern U.S. states (or designated divisions within their boundaries) where Japanese beetle has historically been absent based on repeated surveys and observations, and it is the consensus of the scientific community that the beetle will not survive. Similarly cold arid areas in the western U.S. may meet the criteria for this Category.

States wanting to have their status changed to Category 4 must provide the following documentation:

- Climatic data including average annual moisture, soil types, duration of soil temperatures above or below lethal levels for Japanese beetle, **and**
- Annual trapping data for a 10 year period, including trap density, number of positive and negative traps, response to positive traps, **and**
- Narrative explaining why the state believes establishment is unlikely to occur.

V. HARMONIZATION PLAN COMMITTEES AND MEMBERSHIP

The President of the National Plant Board will appoint the members to the JBHP Survey Committee, whose responsibility is to recommend changes to the list of infested areas (Appendix 8) and partially infested areas (Appendix 9). Membership on the JBHP Survey Committee shall include:

- USDA APHIS PPQ National Japanese Beetle Policy Manager.
- One Central Plant Board representative.
- One Eastern Plant Board representative.
- One Southern Plant Board representative.
- One Western Plant Board representative.
- One nursery industry representative (recommended by the AmericanHort).
- Ad hoc members:
    - One representative from each of the state(s) under consideration, as appropriate.

The USDA representative and one of the Regional Plant Board members (named by the NPB President) will serve as co-chairs of the JBHP Survey committee.

The National Plant Board President shall also appoint a Japanese Beetle Harmonization Plan 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 JBHP Regulatory Treatment committee's membership will include:

- USDA APHIS PPQ Regulatory Treatments Program Coordinator (from Otis Plant Protection Center)
- 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 AmericanHort).

The USDA representative and one of the Regional Plant Board members (named by the NPB President) will serve as co-chairs of the JBHP Survey committee.

The National Plant Board President will appoint a JBHP Review committee, and name a review committee chair, composed of members of the JBHP Survey committee and JBHP Regulatory Treatment committee to conduct a review of the entire JBHP document, as needed. Additional Review committee members may be added, as needed.

VI. 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 or state Category designations) 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 or state Category designations, will only require the approval of the National Plant Board Executive Committee.

Changes to a state's infested status - The JBHP 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. The survey committee co-chairs, or designee, will annually solicit supplemental information from the states for use by this committee, and forward all information on to the committee members for review. Approval requires support of at least 75% of the committee. Recommended changes will be forwarded to the NPB Executive Committee for final approval. Upon approval by the NPB Executive Committee, the co-chairs of the JBHP Survey Committee will amend the appropriate appendices of this Plan, and provide a copy to the NPB President for posting on the NPB web site.

In addition, at any time a state may petition the President of the National Plant Board for a change in their status.

Additions or changes to approved treatments - Review of treatments for approval is an on-going process. Requests for review of a treatment should be made to the co-chairs of the JBHP Regulatory Treatment Review Committee. The co-chairs will forward all information to the committee members for review. Approval requires support of at least 75% of the committee. Recommended changes will be forwarded to the NPB Executive Committee for final approval. Upon approval by the NPB Executive Committee, the co-chairs of the JBHP Treatment Review Committee will amend the appropriate appendices of this Plan to include the treatment, and will provide a copy to the NPB President for posting on the NPB web site.

VII. REGULATORY TREATMENT REQUIREMENTS AND PESTICIDE DISCLAIMERS

All regulatory treatments will be performed under direct supervision of a phytosanitary official or under a compliance agreement. Treatments and procedures under a compliance agreement will be monitored closely throughout the season.

All treatments should be applied at the maximum label rate, unless otherwise specified in this Plan.

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.

The listing of pesticide products in this document does not imply an endorsement of one product over another. Pesticide products listed in the JBHP are products that were determined to have label language that permitted the usage pattern described in the JBHP at the time of label evaluation by the JBHP Regulatory Treatment Review Committee. However, other products with approved active ingredients may exist that have not been included in this document. Labels are subject to change and the user should verify that the product they are using still contains label language that permits the usage pattern. The user assumes all responsibility for using products in a matter that is in legal compliance with the pesticide label.

Equivalent products of the same formulation and amount of active ingredient are acceptable, provided they are labeled for treatment of Japanese beetle, and meet the other stipulations for treatment as listed in this 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.

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.

APPENDIX 1.
SHIPMENT TO CATEGORY 1 STATES

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

Regulated articles (except sod) can be shipped to Category 1 states based on one of the following certification options. States which require advance notification are listed in Appendix 8.

Regulated articles must be safeguarded during adult flight period (June through September) in such a manner as to prevent the movement of adult beetles on regulated articles and in shipping containers/vessels. Plants must be maintained on an impervious barrier to prevent migration of Japanese beetle larvae from the soil below the container or root balls, up into the root balls or containerized plants (as applicable)

Adult mitigation requirements for regulated articles shipped to Category 1 states are found at the end of this Appendix. All criteria must be followed, unless exceptions/exclusions are listed.

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 cannot 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 adult, larval, and pupal 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 a state phytosanitary certificate, or equivalent certificate of compliance, bearing the following Additional Declaration (AD): *"The rooted plants (or crowns) were produced in an approved Japanese beetle (Popillia japonica) free greenhouse or screenhouse as provided in the U.S. Domestic Japanese Beetle Harmonization Plan".*
- See requirements for Japanese Beetle Adult Mitigation Criteria

2. Production During a Pest Free Window.

The entire rooted plant production cycle will be completed within a pest free window, in an approved growing media, such as a commercial growing media, or sterilized media, i.e., planting, growth, harvest, and shipment will occur outside the June through September adult Japanese beetle flight period. The accompanying state phytosanitary certificate, or equivalent certificate of quarantine compliance, shall bear the following Additional Declaration (AD): *"These plants were produced outside the Japanese beetle (Popillia japonica) flight season in Japanese beetle-free growing medium or sterilized field soil as provided in the U.S. Domestic Japanese Beetle Harmonization Plan ".*

Additional adult mitigation requirements do not apply when using this certification option.

3. Application of Approved Regulatory Treatments.
All treatments will be performed under direct supervision of a phytosanitary official or under compliance agreement. All treatments should be applied at the maximum label rate, unless otherwise specified in this Plan. Treatments and procedures under a compliance agreement will be monitored closely throughout the season. State phytosanitary certificates, or equivalent certificates of quarantine compliance, 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 state phytosanitary certificate, or equivalent certificate of quarantine compliance, shall bear the following Additional Declaration (AD): *"The rooted plants were treated to control Japanese beetle (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.

Note: The listing of pesticide products in this document does not imply an endorsement of one product over another. Pesticide products listed in the JBHP are products that were determined to have label language that permitted the usage pattern described in the JBHP at the time of label evaluation by the JBHP Regulatory Treatment Review Committee. However, other products with approved active ingredients may exist that have not been included in this document. Labels are subject to change and the user should verify that the product they are using still contains label language that permits the usage pattern. The user assumes all responsibility for using products in a matter that is in legal compliance with the pesticide label.

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 shall 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 law, where applicable.

The dip treatment targets Japanese beetle larval stages.

Growing media must be at least 50 ^{o}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 during the restricted entry interval and before they are well drained and can be easily handled. Treated material must be maintained on an impervious barrier. During the adult flight period (June to Sept), the dip must occur no more than 2 weeks prior to shipment or be retreated. If plants are exposed to a second or additional flight season, they must be retreated during each flight season. Plants that are dipped outside of the adult flight season are certified until the next flight season, at which time they must be retreated if not sold before the next flight season begins.

See requirements for Japanese beetle Adult Mitigation Criteria

Approved Chemicals – See Appendix 11, Treatment Table

3b. Drench Treatments - Container Plants Only
Only containerized nursery stock with rootballs twelve (12) inches in diameter or smaller and free from field soil are eligible.

- Plants grown in field soil and then potted into soilless container substrates are **not** eligible for certification using this protocol, unless all field soil is removed from the roots so plants are bare root at the time of potting.

Approved growing media used must be free from soil, and consist of synthetic or other substances (other than soil) used singly or in combinations. Examples of approved growing media include pine bark, hardwood bark, expanded or baked clay pellets, expanded polystyrene beads, floral foam, ground coconut husk, ground cocoa pods, ground coffee hulls, ground rice husk, peat, perlite, pumice, recycled paper, rock wool, sawdust, sphagnum, styrofoam, synthetic sponge, vermiculite, and volcanic ash or cinder.

The media shall contain only substances that were not used previously for growing plants or other agricultural purposes. It must be free of plant pests, sand, and related matter, and safeguarded in such a manner as to prevent the introduction of all life stages of Japanese beetle to the media.

This is a prophylactic treatment protocol targeting eggs and first instars (the youngest life stage of Japanese beetle larvae). Plants must be treated before adult Japanese beetle flight season begins (i.e., June 1, or as otherwise determined by the state regulatory official) to be certified using this method, and the protocol only certifies plants for 16 weeks. A treatment during flight season, in the absence of a treatment prior to the start of the adult flight season, is not sufficient to meet certification requirements. Plants treated on or before June 1 (or the beginning of adult flight) and held into the adult flight season will require retreatment after 16 weeks. Plants treated prior to adult flight season and held over past flight season are not eligible for certification using this method unless retreated in the summer. Retreat plants in subsequent years, as necessary. 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. Treated material must be maintained on an impervious barrier.

See requirements for Japanese beetle Adult Mitigation Criteria

Approved Chemicals – See Appendix 11, Treatment Table

3c. Media (Granule) Incorporation - Container Plants Only
Only containerized nursery stock with rootballs twelve (12) inches in diameter or smaller, planted in approved growing media, and free from field soil are eligible.

- Plants grown in field soil and then potted into soilless container substrates are **not** eligible for certification using this protocol, unless all field soil is removed from the roots so plants are bare root at the time of potting.

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.

Approved growing media used must be free from soil, and consist of synthetic or other substances (other than soil) used singly or in combinations. Examples of approved growing media include pine bark, hardwood bark, expanded or baked clay pellets, expanded polystyrene beads, floral foam, ground coconut husk, ground cocoa pods, ground coffee hulls, ground rice husk, peat, perlite, pumice, recycled paper, rock wool, sawdust, sphagnum, styrofoam, synthetic sponge, vermiculite, and volcanic ash or cinder.

The media shall contain only substances that were not used previously for growing plants or other agricultural purposes. It must be free of plant pests, sand, and related matter, and safeguarded in such a manner as to prevent the introduction of all life stages of Japanese beetle to the media. .

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 granular incorporated mix or retreated using one of the approved dip or drench treatments.

See requirements for Japanese beetle Adult Mitigation Criteria

Approved Chemicals – See Appendix 11, Treatment Table

3d. **Methyl Bromide Fumigation**
Regulated articles: 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 ^{o}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.

See requirements for Japanese beetle Adult Mitigation Criteria

4. Detection Survey for Origin Certification
Once Japanese beetle is detected in a political subdivision 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 using this method of certification must be the origin of all regulated articles, or be required to receive only regulated articles qualified for entry into Category 1 states.

Additional adult mitigation requirements do not apply when using this certification option.

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 above the 5 acre base rate of 3 traps. Example: a 12 acre field would require 3 + 1 = 4 traps.
- For sites 30 to 160 acres in size, 1 trap will be used for each 10 acres above the 30 acre base rate of 8 traps. Example: a 42 acre site would require 8+2 = 10 traps.
- Sites greater than 160 acres, 8 traps will be used for each 100 acres above the 160 acre base rate of 21 traps. Example: a 175 acre site would require 21 + 8 = 29 traps.

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 throughout residential and rural/residential areas that are susceptible to Japanese beetle introduction and establishment.

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 per manufacturer's recommendations, to maintain trapping efficacy. Traps shall be placed and/or monitored regularly by official regulatory authorities during the entire period of adult flight. Records shall be maintained of trap monitoring and all Japanese beetle captures.

The survey shall be conducted annually during the entire adult flight period. Traps must be in place by June 1 and remain in place until at least September 30.

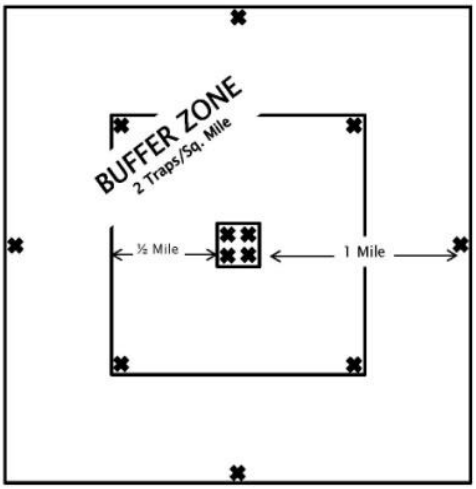


Figure 1: Example of trap locations in a 12 acre nursery site plus the surrounding 1 mile buffer zone. Each X indicates placement of a trap.

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. See trapping protocols in Appendix 4.

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. 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.

The state phytosanitary certificate or equivalent certificate of compliance 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, as provided in the U.S. Domestic Japanese Beetle Harmonization Plan.*

Adult Japanese Beetle Mitigation Requirements:
The following certification requirements are required only during the adult Japanese beetle flight period (June 1 – September 30).

The shipping nursery must have systems in place to ensure that no adult Japanese beetles are shipped on regulated articles which have otherwise been protected from larval infestation. These systems must include production practices which assure that the:

1. regulated article(s) is/are free of adult Japanese beetle prior to loading
2. shipping vehicle/container is free of adult Japanese beetle
3. the holding and loading area(s) is/are free of adult Japanese beetle
4. regulated article(s) is/are safeguarded during shipment through the Japanese beetle infested area during the adult beetle flight period
5. regulated article(s) is/are safeguarded from re-infestation during the holding and loading process

All of the following criteria apply:

1. The regulated article(s) is/are apparently free of adult Japanese beetle prior to loading:
   - Can be met by treatment with an insecticide followed by an inspection. (See nursery stock insecticide treatments at the end of this appendix); **or**
   - Through Detection Survey for Origin Certification trapping protocol with an inspection during loading. If Detection Survey for Origin Certification trapping is utilized, at least one trap must be placed in the loading area as well those placed in the nursery production areas. Trap results must be negative. If any beetles are caught in a trap or detected on the plants during inspection, then treatment of the regulated articles with an insecticide is required. Once beetles are detected in a trap at the loading area, promptly remove the trap from the loading area because the trap will attract more beetles to the site and increase the risk of plants becoming infested with adult beetles; **or**

- The use of a 100%, thorough visual inspection of all regulated articles in the shipment can be substituted for treatment and detection survey. The visual inspection may be used at the discretion of the regulatory official in the origin state, as determined on a case-by-case basis. It must be conducted at the time of loading, by a regulatory official. If any adult Japanese beetles are found on the regulated articles, the entire shipment must be treated as above.
- *This step is not required for regulated articles produced in a Japanese beetle free greenhouse/screenhouse*

2. The shipping vehicle/container is apparently free of adult Japanese beetle:
   - Truck trailers/enclosed shipping containers must be inspected prior to loading to ensure the enclosed area is free of Japanese beetle adults. If Japanese beetle adults are found, the trailer/container will not be used to ship regulated articles to Category 1 states until it is treated with an insecticide approved for Japanese beetle control, re-inspected, and found free of live Japanese beetle adults. (See Truck/Trailer/Container Shipping container treatments information at the end of this appendix) Alternatively, the inside of the trailer may be power washed with a high pressure power washer i.e. 3,000 psi or greater and then re-inspected to assure absence of Japanese beetle.

3. The holding and loading area(s) is/are apparently free of adult Japanese beetle:
   - Holding and loading areas must be designed to minimize opportunity for adult Japanese beetle to enter the area. Firms must take such measures as removing any host plants known to be attractive to adult Japanese beetle, such as Linden trees or *Prunus* species, in the immediate vicinity.

4. Regulated article(s) is/are safeguarded during shipment through the Japanese beetle infested area during the adult beetle flight period: If regulated articles are shipped in bulk (not shipped in individual boxes or containers), the enclosed trailer or compartment must remain closed, or an open trailer remain tarped, during transport until the vehicle enters non-infested portions of the country. No open shipping containers are to be used during the adult flight period of June through September or earlier based on seasonal occurrence history.

5. Additionally, a minimum of three of the following best management practices must be utilized by the shipping firm, in consultation with the state regulatory agency, to ensure regulated article(s) is/are safeguarded from re-infestation during the holding and loading process:
   - Conduct visual survey of holding and loading area following protocol for visual survey of airports as found in the USDA Japanese Beetle Program Manual. Visual surveys must occur at a minimum of three to five times per week during flight season, be conducted during the daytime under conditions favorable for adult flight, and each be at least 15 minutes in duration. Results can be used to determine which additional BMPS may be the best fit for the situation.
   - Hold regulated articles in a secure, enclosed area such as an enclosed warehouse, room, screened greenhouse, secure screen house, refrigerated chamber, closed semi-trailer or enclosed shipping container or boxes. Safeguard regulated articles during the loading process though use of coverings and similar mechanical barriers.
   - Avoid loading on clear, sunny days when the air temperature is between 70° - 95°F (21° - 35°C.) during the peak flight time period (10 am – 3 pm).
   - Inspect plants during the loading process to ensure that no Japanese beetle adults are present, with an emphasis on high risk species.
   - If the stock is shipped in boxes, the exterior of the boxes must be inspected to assure absence of Japanese beetle adults.
   - If adult beetles are actively flying in nursery/loading area at time of loading, treat the loaded shipping container with 1-Shot®. Product canister must be placed near center of container. Container must remain sealed for a minimum of 30 minutes after canister has completely released aerosol product, and be completely ventilated prior to shipment leaving the treatment site. (As of 10/3/2014, this product is

registered for use in a limited number of states.)

Note: Plants with existing adult Japanese beetle damage emit volatile signals from the damaged tissue which attract additional adult Japanese beetle. More caution is needed to make sure these plants do not become re-infested once treated, as well as more careful scrutiny during inspection.

Adult Japanese Beetle Mitigation – Nursery Stock Insecticide Treatments
This is a preventative treatment to reduce the possibility of transporting adult Japanese beetle on plant foliage. Follow all label directions, including not applying treatments to plants in flower, as applicable. Insecticide treatments must be applied during adult flight season (late May to September). If plants are not shipped within 14 days, they must be retreated. Treatments **must be** combined with a surfactant to improve adult killing effectiveness of insecticides. All plant foliage must be thoroughly wetted with the treatment. Do not apply treatments to foliage if rainfall is expected before treatments have sufficient time to dry. Do not apply irrigation until after treatment has had sufficient time to dry. Protect treated plants from reinfestation.

Approved Chemicals – See Appendix 11, Treatment Table

Adult Japanese Beetle Mitigation – Truck Trailer / Shipping Container Insecticide Treatments
This is a preventative treatment to reduce the possibility of transporting adult Japanese beetle in the shipping vehicle / container. Insecticide treatments must be applied during adult flight season (late May to September) if adult Japanese beetles are found inside the shipping trailer/container during inspection (see #2 above). The entire interior surface of the trailer/container compartment must be treated. Protect the shipping trailer/container from reinfestation following treatment, such as by keeping trailer doors closed. Reinspect the shipping trailer/container after treatment to ensure all adult Japanese beetles are dead. Dead beetles should be removed with a broom or leaf-blower to further reduce the risk of beetle recovery from the insecticide treatment inside the shipping trailer/container, as well as to prevent regulatory concerns that may occur at the receiving state if dead beetles are found inside the shipping trailer/container compartment.

Approved Chemicals – See Appendix 11, Treatment Table

APPENDIX 2.
SHIPMENT TO CATEGORY 2 STATES

Regulated articles from any infested area (Category 3 state or infested area in Category 2 state) may be shipped to Category 2 states under any certification protocol for shipment to Category 1 states, or any of the protocols described in this appendix for shipment to Category 2 states.

Shipments of regulated articles from non-infested areas in Category 2 states must be clearly marked with county of origin.

Regulated articles must be safeguarded during adult flight period (June through September) in such a manner as to prevent the movement of adult beetles on regulated articles and in shipping containers/vessels. Plants must be maintained on an impervious barrier to prevent movement of Japanese beetle larvae from the soil below the container or root balls, up into the root balls or containerized plants.

Adult mitigation requirements for regulated articles shipped to Category 2 states are found at the end of this Appendix. All criteria must be followed, unless exceptions/exclusions are listed.

Certification Options

1. Application of Approved Regulatory Treatments

All treatments will be performed under direct supervision of a phytosanitary official or under compliance agreement. All treatments should be applied at the maximum label rate, unless otherwise specified in this Plan. Treatments and procedures under a compliance agreement will be monitored closely throughout the season. State phytosanitary certificates, or equivalent certificates of compliance, 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 certificate shall bear the following Additional Declaration (AD): "*The plants were treated to control Japanese beetle (Popillia japonica) 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 is appropriately labeled, effectively controls Japanese beetle, and is mutually agreeable to the states involved.

Note: The listing of pesticide products in this document does not imply an endorsement of one product over another. Pesticide products listed in the JBHP are products that were determined to have label language that permitted the usage pattern described in the JBHP at the time of label evaluation by the JBHP Regulatory Treatment Review Committee. However, other products with approved active ingredients may exist that have not been included in this document. Labels are subject to change and the user should verify that the product they are using still contains label language that permits the usage pattern. The user assumes all responsibility for using products in a matter that is in legal compliance with the pesticide label.

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 shall 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, where applicable.

The dip treatment targets Japanese beetle larval stages.

Growing media must be at least 50 ^{o} 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 the restricted entry interval, and they are well drained and can be easily handled. Treated material must be maintained on an impervious barrier. During the adult flight period (June to Sept), the dip must occur no more than 2 weeks prior to shipment or be retreated. If plants are exposed to a second or additional flight season, they must be retreated during each flight season. Plants that are dipped outside of the adult flight season are certified until the next flight season, at which time they must be retreated if not sold before the next flight season begins.

See requirements for Japanese beetle Adult Mitigation Criteria

Approved Chemicals – See Appendix 11, Treatment Table

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. Vegetation should be mowed to a height of 3 inches or less before application. Do not mow until after sufficient irrigation or rainfall has occurred. Apply May through July.

Approved Chemicals – See Appendix 11, Treatment Table

2. Japanese Beetle Nursery Trapping Program
The purpose of the trapping program or detection survey is to determine the Japanese beetle status of nursery sites *within* the Japanese beetle partially or generally infested area. Regulated articles 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 state phytosanitary certificate , or equivalent certificate of compliance with the following) 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, as provided in the U.S. Domestic Japanese Beetle Harmonization Plan."*

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 introducing Japanese beetle in 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 per manufacturer's recommendations, to maintain trapping efficacy. Traps shall be placed and/or monitored regularly by official regulatory authorities during the entire period of adult flight. Records shall be maintained of trap monitoring and all Japanese beetle captures.
- The survey shall be conducted annually during the entire adult flight period. Traps must be in place by June 1 and remain in place until at least September 30.

If **no** beetles are captured in the survey, the nursery site meets the criterion for shipping to Category 2 states. If *one or two beetles* are captured, in total, from all traps set for the detection 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. If beetles are captured in the traps, a delimiting survey must be conducted in the *following* year, using the protocols specified in Appendix 4. If no beetles are captured, in total, from all traps in the delimitation survey in the season 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. 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.

Additional adult mitigation requirements do not apply when using this certification option.

3. Field Grown Nursery Stock 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 Category 2 states.

Under regulatory oversight, nursery operations producing field-grown plants shipped as balled & burlapped or field-potted plants may be certified under this program. 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 state phytosanitary certificate, or equivalent certificate of compliance, that includes the following Additional Declaration (AD): "*The rooted plants (or plant material) are certified as apparently free of Japanese beetle (Popillia japonica) in accordance with the Field Grown Nursery Stock Accreditation Program protocol, as provided in the U.S. Domestic Japanese Beetle Harmonization Plan.*"

This option incorporates production practices that reduce Japanese beetle pest risk, coupled with a soil sampling protocol to assure adequate risk mitigation. Accreditation will not be granted if *more than one* Japanese beetle larva is collected during sampling. Management practices include all the following:

Maintenance of a weed-free zone. A weed-free zone is that area of the field that occupies the intended rootball size of the nursery stock plus 12-inches on all sides. 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, 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 (June to September). 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. 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) either uniformly or at random locations throughout the entire field. Samples should be specifically taken in the harvest area of the nursery growing rows. Specific areas with a higher susceptibility for harboring Japanese beetle grubs, such as weedy or grassy areas, 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 larvae is collected during sampling. 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

See requirements for Japanese beetle Adult Mitigation Criteria

4. Containerized Nursery Stock Accreditation Program

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

- Only approved growing media or sterilized media (including sterilized compost), or a combination of the two, shall be used and plants for potting will be free of all life stages of Japanese beetle.
- Grasses and sedges (plants in the families Poaceae and Cyperaceae) are not eligible for certification using this option.
- 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.

Containerized nursery stock must be accompanied by a state phytosanitary certificate, or equivalent certificate of compliance, including the following Additional Declaration (AD): "*The plants have been found to be free from Japanese beetle (Popillia japonica) on the basis of a container accreditation program as provided in the U.S. Domestic Japanese Beetle Harmonization Plan*."

See requirements for Japanese beetle Adult Mitigation Criteria

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 if the sod is coming from sites under a compliance agreement and managed to reduce the risk of Japanese beetle infestation. Management activities shall include:

- Maintenance of a Japanese beetle adulticide program on the sod-farm periphery, **and**
- Removal of Japanese beetle attractive plant species from the immediate growing area (where practical), **and**
- Application of approved insecticide treatments to the sod, **and**
- Inspection of sod at time of harvest for presence of Japanese beetle larvae, pupae and adults. Visual inspection at time of shipment for adult Japanese beetle

If more than one of either a larva, pupa, or adult beetle is found during sod harvest or at time of shipment, the load is not eligible for certification.

Specific requirements for Japanese beetle Adult Mitigation Criteria found in section 5 of this Appendix do not apply. Instead, to mitigate the potential for transporting adults, the harvested sod must be inspected just prior to shipment and found free of all life stages of Japanese beetle, and the vehicle transporting the regulated articles must be moved directly through the infested area without stopping (except for refueling or for traffic conditions, such as traffic lights or stop signs), or be stored, packed or handled at locations approved by an inspector as not posing a risk of infestation by Japanese beetle.

A state phytosanitary certificate, or equivalent certificate of compliance, 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 (Popillia japonica) according to the criteria for shipment to Category 2 states as provided in the U.S. Domestic Japanese Beetle Plan.*"

One of the following pesticide treatments must be 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). These insecticide treatments target eggs and early first instar larvae, so they must be applied as preventative treatments between April 1 and July 31. Sod cannot be shipped until sufficient irrigation or rainfall (0.5 to 1 inch) has occurred to move the active ingredient through the thatch and into the root zone where grubs feed. Retreat if exposed to a second flight season.

During dry weather, expect to find higher Japanese beetle populations in irrigated turf, because turf sites become more favorable oviposition sites when surrounding areas are dry and unfavorable.

Approved Chemicals – See Appendix 11, Treatment Table

Adult Japanese Beetle Mitigation Requirements:
The following certification requirements are required only during the adult Japanese beetle flight period (June 1 – September 30).

The shipping nursery must have systems in place to ensure that no adult Japanese beetles are shipped on regulated articles which have otherwise been protected from larval infestation. These systems must include production practices which assure that:

1. the regulated article(s) is/are free of adult Japanese beetle prior to loading
2. the shipping vehicle/container is free of adult Japanese beetle
3. the holding and loading area(s) is/are free of adult Japanese beetle
4. regulated article(s) is/are safeguarded during shipment through the Japanese beetle infested area during the adult beetle flight period

5. regulated article(s) is/are safeguarded from re-infestation during the loading and holding process

All of the following criteria apply:

1. The regulated article(s) is/are apparently free of adult Japanese beetle prior to loading:
   - Can be met by treatment with an insecticide followed by an inspection; **or**
   - Through Site Specific Trapping Protocol with an inspection during loading. If Site Specific trapping is utilized, at least one trap must be placed in the loading area as well those placed in the nursery production areas. Trap results must be negative. If any beetles are caught in a trap then treatment of the regulated articles with an insecticide is required. Once beetles are detected in a trap, promptly remove the trap from the loading area because the trap will attract more beetles to the site and increase the risk of plants becoming infested with adult beetles; **or**
   - The use of a 100%, thorough visual inspection of all regulated articles in the shipment can be substituted for treatment and detection survey. The visual inspection may be used at the discretion of the regulatory official in the origin state, as determined on a case-by-case basis. It must be conducted at the time of loading, by a regulatory official. If any adult Japanese beetles are found on the regulated articles, the entire shipment must be treated as above.
   - *This step is not required for regulated articles produced in a Japanese beetle free greenhouse/screenhouse*

2. The shipping vehicle/container is apparently free of adult Japanese beetle:
   - Truck trailers/enclosed shipping containers must be inspected prior to loading to ensure the enclosed area is free of Japanese beetle adults. If Japanese beetle adults are found, the trailer/container will not be used to ship regulated articles to Category 2 states until it is treated with an insecticide approved for Japanese beetle control, re-inspected, and found free of live Japanese beetle adults. Alternatively, the inside of the trailer may be power washed with a high pressure power washer i.e. 3,000 psi or greater and then re-inspected to assure absence of Japanese beetle.

3. The holding and loading area(s) is/are apparently free of adult Japanese beetle:
   Holding and loading areas must be designed to minimize opportunity for adult Japanese beetle to enter the area. Firms must take such measures as removing any host plants known to be attractive to adult Japanese beetle (see Appendix 6), such as Linden trees or *Prunus* species, in the immediate vicinity.

4. Regulated articles are safeguarded during shipment through the Japanese beetle infested area during the adult flight period.
   - If regulated articles are shipped in bulk (not shipped in individual boxes or containers), the enclosed trailer or compartment must remain closed, or an open trailer remain tarpped, during transport until the vehicle enters non-infested portions of the country. No open shipping containers are to be used during the adult flight period of June through September or earlier based on seasonal occurrence history.

5. Additionally, a minimum of two of the following best management practices must be utilized by the shipping firm, in consultation with the state regulatory agency, to ensure regulated article(s) is/are safeguarded from re-infestation during the holding and loading process:
   - Conduct visual survey of holding and loading area following protocol for visual survey of airports as found in the USDA Japanese Beetle Program Manual. Visual surveys must occur at a minimum of three

to five times per week during flight season, be conducted during the daytime under conditions favorable for adult flight, and each be at least 15 minutes in duration. Results can be used to determine which additional BMPS may be the best fit for the situation.

- Hold regulated articles in a secure, enclosed area such as an enclosed warehouse, room, screened greenhouse, secure screen house, refrigerated chamber, closed semi-trailer or enclosed shipping container or boxes. Safeguard regulated articles during the loading process though use of coverings and similar mechanical barriers.
- Avoid loading on clear, sunny days when the air temperature is between 70° - 95°F (21° - 35°C.) during the peak flight time period (10 am – 3 pm).
- Inspect a representative sample of plants during the loading process to assure that no Japanese beetle adults are present, with an emphasis on high risk species.
- If the stock is shipped in boxes, the exterior of the boxes must be inspected to assure absence of Japanese beetle adults.
- If adult beetles are actively flying in nursery/loading area at time of loading, treat the loaded shipping container with 1-Shot®. Product canister must be placed near center of container. Container must remain sealed for a minimum of 30 minutes after canister has completely released aerosol product, and be completely ventilated prior to shipment leaving the treatment site. (As of 10/3/2014, this product is registered for use in a limited number of states.)

Note: Plants with existing adult Japanese beetle damage emit volatile signals from the damaged tissue which attract additional adult Japanese beetle. More caution is needed to make sure these plants do not become re-infested once treated, as well as more careful scrutiny during inspection.

Adult Japanese Beetle Mitigation – Nursery Stock Insecticide Treatments
This is a preventative treatment to reduce the possibility of transporting adult Japanese beetle on plant foliage. Follow all label directions, including not applying treatments to plants in flower, as applicable. Insecticide treatments must be applied during adult flight season (late May to September). If plants are not shipped within 14 days, they must be retreated. Treatments **must be** combined with a surfactant to improve adult killing effectiveness of insecticides. All plant foliage must be thoroughly wetted with the treatment. Do not apply treatments to foliage if rainfall is expected before treatments have sufficient time to dry. Do not apply irrigation until after treatment has had sufficient time to dry. Protect treated plants from reinfestation.

Approved Chemicals – See Appendix 11, Treatment Table

Adult Japanese Beetle Mitigation – Truck Trailer / Shipping Container Insecticide Treatments
This is a preventative treatment to reduce the possibility of transporting adult Japanese beetle in the shipping vehicle / container. Insecticide treatments must be applied during adult flight season (late May to September) if adult Japanese beetles are found inside the shipping trailer/container during inspection (see #2 above). The entire interior surface of the trailer/container compartment must be treated. Protect the shipping trailer/container from reinfestation following treatment, such as by keeping trailer doors closed. Reinspect the shipping trailer/container after treatment to ensure all adult Japanese beetles are dead. Dead beetles should be removed with a broom or leaf-blower to further reduce the risk of beetle recovery from the insecticide treatment inside the shipping trailer/container, as well as to prevent regulatory concerns that may occur at the receiving state if dead beetles are found inside the shipping trailer/container compartment.

Approved Chemicals – See Appendix 11, Treatment Table

APPENDIX 3:
SUMMARY OF REQUIREMENTS FOR SHIPMENT INTO CANADA FROM THE UNITED STATES (Canadian Food Inspection Agency, CFIA D-96-15)

Refer to the USDA Phytosanitary Export Database (PExD) for most current information and shipment specific requirements.

- 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 Japanese beetle 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 Japanese beetle free greenhouse/screen house: **or**
- Treated for Japanese beetle in accordance with the U.S. Domestic Japanese Beetle Harmonization Plan treatments for Category 1 states (Appendix 1); **or**
- Produced outside the Japanese beetle flight season; **or**
- Produced in a Japanese beetle 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 Japanese beetle 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 Japanese beetle 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 Japanese beetle-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 Japanese beetle in accordance with the U.S. Domestic Japanese beetle Harmonization Plan treatments for Category 2 states (Appendix 2); **or**
- Produced outside the Japanese beetle flight season; **or**
- Produced in a Japanese beetle 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 Japanese beetle 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 Japanese beetle will not be allowed if the rootballs are over 30 cm (12 inches in diameter).

APPENDIX 4.
STATEWIDE DETECTION & DELIMITING SURVEY (TRAPPING)

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. Traps must be in place by June 1 and remain in place until at least September 30.

1. Detection Trapping 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 official monitoring survey 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.

2. Delimiting Trapping Program for States with Japanese Beetle Quarantines
Any detection of Japanese beetle should prompt a delimiting investigation into the possible source of introduction, and the placement of additional traps. 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, and 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.

A political subdivision is considered infested if multiple adult 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 political subdivision for two or more 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 eradicative treatment has been applied.

5	5	5	5	5	5	5
5	5	5	5	5	5	5
5	5	25	25	25	5	5
5	5	25	49	25	5	5
5	5	25	25	25	5	5
5	5	5	5	5	5	5
5	5	5	5	5	5	5

Figure 1. Delimitation trapping scheme to facilitate eradication. 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.

3. Detection Trapping Program for Non-Infested or Partially Infested States without Japanese Beetle Quarantines
Those states that remain non-infested or partially infested must conduct official detection monitoring survey to verify its continued absence. 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 in residential and rural/residential areas that are susceptible to Japanese beetle introduction and establishment.

A political subdivision will be considered infested if no delimitation or mitigation action is taken once Japanese beetle is detected, or after two consecutive years of detections.

4. Delimiting Trapping Programs for Non-Infested or Partially Infested States without Japanese Beetle Quarantines

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 political subdivision is considered infested if multiple Japanese beetles are trapped within two square miles in one year, or if delimitation surveys detect an alternate life stage, e.g. larvae, or if Japanese beetle is trapped in the same political subdivision for two or more successive years. An infested area will maintain its infested status until eradication efforts have resulted in two subsequent and consecutive years of negative trap survey conducted at the delimitation level.

5. Monitoring Receiving Nursery Sites for Japanese Beetle Introductions

States may wish to conduct detection trapping specifically around facilities receiving host commodities or means of conveyance from infested areas, for interceptions of Japanese beetle. 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 though out 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.

The trapping of receiving nurseries is intended for monitoring purposes only, and is not to be used for the certification of nursery stock.

APPENDIX 5.
BIOLOGY AND PEST RISK ANALYSIS[6]

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.

In most parts of its range, Japanese beetle is univoltine, that is it requires one year to complete its life cycle. In some northern areas, it may require two years to complete its life cycle. 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 with sufficient moisture 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 (up to 130) 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 50°F (10°C) 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 egg incubation is approximately 86°F (30°C). Japanese beetle eggs are not cold hardy. In general, Japanese beetle develops from egg to adult at temperatures between 63.7^{o}F (17.5^{o}C) and 82°F (27.5^{o}C).

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. The pupal period lasts about 7 to 17 days, at 68° to 77°F (20° to 25°C).

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 in 95 plant families, of these 67 are light feeding hosts, 59 are moderate hosts, and 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 dispersal. 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 63.5^{o}F (17.5^{o}C) and 82°F (27.5^{o}C) for development and survival, and no eggs hatch at temperatures below 59°F (15°C). In winter, soil temperatures colder than 15°F (-9.4^{o}C) cause larval mortality. Snow cover helps to thermally insulate

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

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). 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 NPB 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 scientific evidence and survey information, as available.

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

APPENDIX 6
PREFERRED HOSTS[6]

Scientific name	Common name
Acer patmatum	Japanese maple
Acer platanoides	Norway maple
Aesculus hippocastanum	Horsechestnut
Althaea officinalis	Marshmallow
Althaea rosea	Hollyhock
Asparagus officinalis	Asparagus
Betula populifoliaa	Gray birch
Castanea dentata	American chestnut
Clethra alnifolia	Sweet pepperbush
Glycine max	Soybean
Hibiscus palustris	Common rosemallow
Hibiscus syriacus	Shrub-althea
Juglans nigra	Black walnut
Kerria japonica	Globeflower
Lagerstroemia indica	Crapemyrtle
Malus haccata	Crabapple
Malus floribunda	Japanese flowering crabapple
Malus sylvestris	Apple
Malva rotundifolia	Mallow
Oenothera biennis	Evening-primrose
Parthenocissus quinquefolia	Virginia-creeper
Platanus acerifolia	London planetree
Polygonum orientale	Princesplume smartweed
Polygonum pensylvanicum	Pennsylvania smartweed
Populus nigra italica	Lombardy poplar
Prunus armeniaca	Apricot
Prunus avium	Sweet cherry
Prunus cerasus	Sour cherry
Prunus domestica	Garden plum
Prunus persica	Peach
Prunus persica nectarina	Nectarine
Prunus salicina	Japanese plum
Prunus serotina	Black cherry
Rheum rhaponticum	Garden rhubarb
Rhus toxicodendron	Poison-ivy
Rosa spp.	Rose
Salix discolor	Pussy willow
Sassafras albidum	Sassafras
Sorhus americana	American mountain-ash
Tilia americana	American linden
Ulmus americana	American elm
Ulmus procera	English elm
Vaccinium corymbosum	Highbush blueberry
Vitis aestivalis	Summer grape
Vitis labrusca	Foxgrape
Vitis vinifera	European wine grape
Zea mays	Corn

APPENDIX 7.
ANNUAL STATE SURVEY RESULTS FORM

Japanese Beetle Harmonization Plan Annual Survey Results

Please complete this survey and return to Julie Van Meter by December 1, annually

Japanese beetle infested areas include any political subdivision that is known to harbor an infestation. The determination of infested status will be based on detection and delimitation surveys as defined in the Japanese Beetle Harmonization Plan, with the exception of category 4 states.

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; or
- 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).

States that do not conduct official Japanese beetle monitoring surveys, or that fail to return survey results, will be considered generally infested and their status changed to Category 3.

……

State: _____

Name, phone # and e-mail address of state contact, if other than SPRO:

_____

What Category is your State currently? 1 2 3 4

Was an official trapping survey conducted in the past 12 months? Yes No

How many detection & delimiting traps were set in uninfested counties?

_____

Were all uninfested counties officially surveyed in the past year? Yes No
If no, please explain survey strategy (below or attach comments):

_____
_____
_____

Date by which all traps were set: _____
Date at which trap retrieval began: _____

Lure used: _____

Were any uninfested counties found positive for Japanese beetle? Yes No

Please list new infested counties:_____
_____
_____

Based on survey results, should your State Category be changed? Yes No

If yes, change the state to Category 1 2 3 4

Does your State have a specific Japanese beetle regulation or quarantine? Yes No

If you are a Category 2 state, is Japanese beetle certification required for regulated articles from infested areas, destined to infested counties in your state? Yes No

If yes, allow shipments to all infested counties listed in Appendix 9, or only select counties?

All None Select

If select counties, please list here:_____

Additional comments: _____
_____
_____
_____

Please send completed survey to julie.vanmeter@nebraska.gov by December 1, annually.

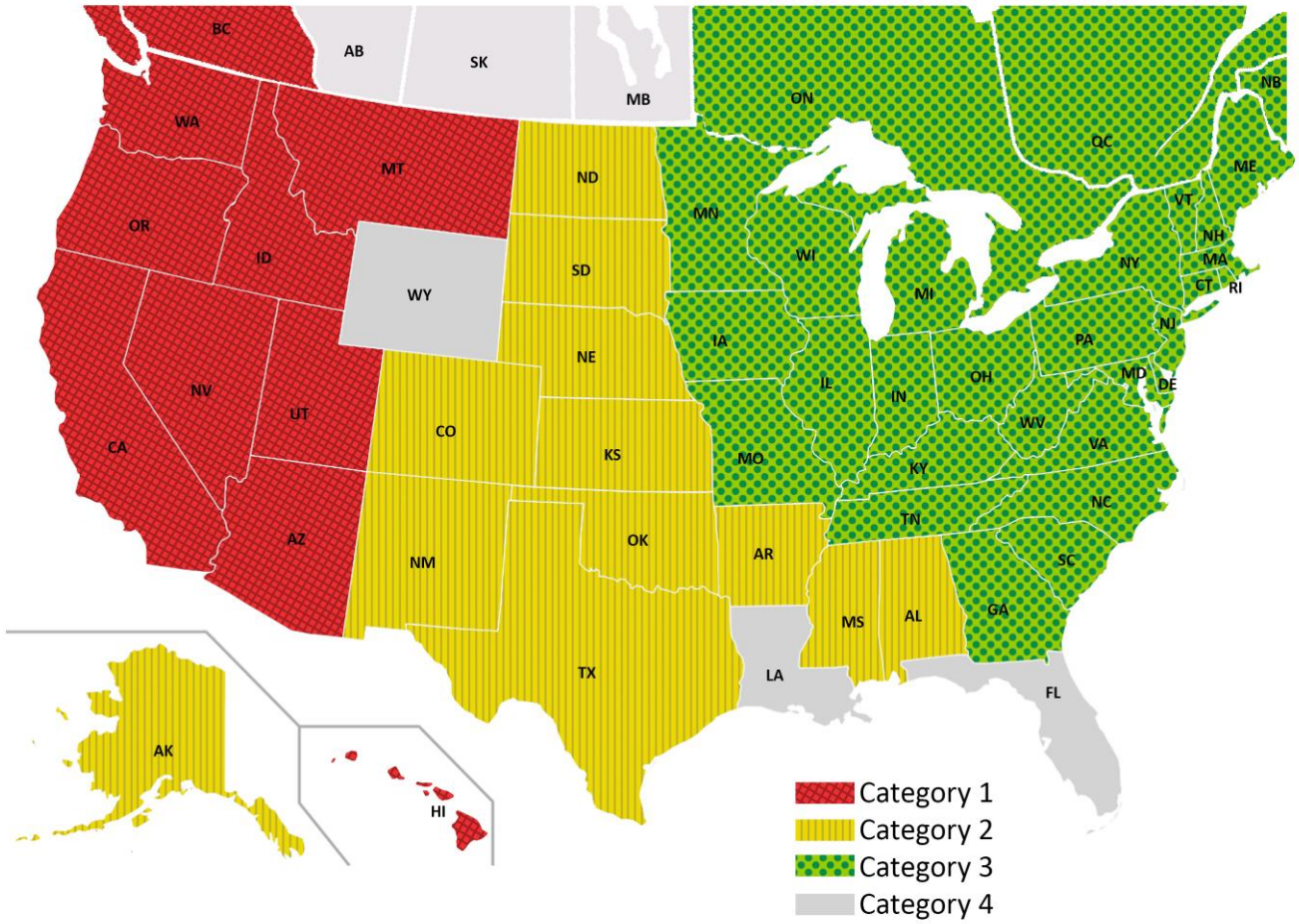
APPENDIX 8. LIST OF INFESTED/NON-INFESTED DOMESTIC AREAS

This list of Japanese beetle-infested areas (and the list of partially infested areas in Appendix 9) will be updated annually by the Japanese Beetle Survey Committee. Additionally, at any time, a state may petition the President of the NPB for a change in their status. Map included for visual reference

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		Oregon	OR	1 ***
*	Mississippi	MS	2		Utah	UT	1 ***
	Missouri	MO	3	**	Washington	WA	1 ***
*	Nebraska	NE	2		Wyoming	WY	4
	New Hampshire	NH	3				
	New Jersey	NJ	3				
	New York	NY	3				
	North Carolina	NC	3				
*	North Dakota	ND	2				
	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 has enacted a state exterior quarantine or other JB regulation, and may not accept terms of JBHP. Contact directly for certification requirements.***							

As of 3/11/2016

Map of the United States and Canada
*as of March 11, 2016



Category 1 & 2 – Review certification requirements to ship regulated articles to these states

Category 3 & 4 – No Japanese beetle specific certification requirements to ship regulated articles to these states

APPENDIX 9. 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
North Dakota	ND	Cass, Burleigh, Grand Forks	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

As of March 22, 2016

APPENDIX 10
EXAMPLE COMPLIANCE AGREEMENT

JAPANESE BEETLE COMPLIANCE AGREEMENT
FOR SHIPMENT OF REGULATED ARTICLES

1. NAME AND MAILING ADDRESS OF ESTABLISHMENT *<Participating Nursery>*	**2. LOCATION** *<Physical address or description of location>*

3. REGULATED ARTICLES (Host Commodities)
Soil, humus, compost, manure, and all growing media. All plants with roots, grass sod, plant crowns, or roots for propagation. Bulbs, corms, tubers, and rhizomes or ornamental plants. Any other plant, plant part, article, or means of conveyance that presents a hazard of spreading live Japanese beetle.

4. APPLICABLE STATE QUARANTINE(S) OR REGULATIONS
The following states have established quarantines against Japanese beetle, its hosts, and possible carriers: Alabama, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, and Washington.

5. ISSUING STATE AUTHORITY, BACKGROUND INFORMATION, AND TERMS
Section <*issuing state authority*> authorizes the <*State Department of Agriculture*> to enter into compliance agreements with persons engaged in the growing, handling, or moving of plants or plant products.

Japanese beetle *(Popillia japonica)* is a destructive plant pest. Japanese beetle grubs damage lawns, golf courses, and pastures. Japanese beetle adults attack the foliage, flowers, or fruits of more than 300 different ornamental and agricultural plants. Japanese beetles were first found in the U.S. in 1916 and has since spread to most of the eastern U.S.

The above nursery enters into this compliance agreement with the <*State Department of Agriculture*> in order to qualify the movement of nursery and greenhouse plants to areas with a Japanese beetle (JB) regulatory strategy. All shipments of host commodities shall be in accordance with the National Plant Board U.S. Domestic Japanese Beetle Harmonization Plant and regulations of the receiving state.

This agreement is subject to <*State Authority*>. Any certificates issued for use by <*participating nursery*> remain the property of the <*State Department of Agriculture*> and may not be distributed for use by any other entity, and must be returned upon request of the inspector or any other authorized representative of the <*State*>. No liability shall be attached to the <*State Department of Agriculture*> or to any representative of the Department with respect to this certificate.

I, *(print name)* _____the undersigned, agree to handle, pack, process, and move host plants and commodities in accordance with all applicable best management practices, nursery laws and regulations; use all permits and certificates in accordance with instructions; maintain and offer for inspection such records as may be required; and abide by the stipulations in the attached modules.

6. SIGNATURE	**7. TITLE**	**8. DATE SIGNED**
Phone Number:	Email Address:	**9. AGREEMENT NO.**

The affixing of the signatures below will validate this agreement, which shall remain in effect until <*December 31, 20__*>, but may be revised as necessary or revoked for noncompliance.		10. DATE OF AGREEMENT
12. OFFICIAL (name and title)	13. ADDRESS	
14. SIGNATURE	15. DATE	

Regulatory Strategies

The **U.S. Domestic Japanese Beetle Harmonization Plan** (Harmonization Plan) provides four Japanese beetle regulatory strategies based on a state's pest classification. These classifications are as follows:

- Category 1 – Uninfested/Quarantine Pest
- Category 2 – Uninfested or Partially Infested
- Category 3 – Partially or Generally Infested
- Category 4 – Historically not known to be infested/Unlikely to Become Established

The Japanese Beetle Harmonization Plan should be carefully reviewed before shipping any regulated article from a state known to be infested with Japanese beetle. The complete plan can be viewed on the National Plant Board website (http://nationalplantboard.org/japanese-beetle-harmonization-plan/)

When there are conflicting requirements, state quarantines supersede the U.S. Japanese Beetle Harmonization Plan.

State Quarantines or Regulations

Regulated articles shipped to **category 1** and **category 2** states must be produced and certified according to options as outlined in the current version of the "U.S. Domestic Japanese Beetle Harmonization Plan". Any additional requirements or limitations imposed by a state quarantine must be followed. Below is a list of those states with established Japanese beetle quarantines, the title of their Japanese beetle quarantine regulations, and links to each state's quarantine:

Category 1 States

Arizona – Administrative Code, Title 3, Chapter 4, Supp. 12-3, Section R3-4-248
https://agriculture.az.gov/r3-4-248-japanese-beetle

California – Code of Regulations, Title 3, Division 4, Chapter 3, Subchapter 4, Article 3, Section 3280
http://pi.cdfa.ca.gov/pqm/manual/htm/pqm_index.htm

Idaho - Administrative Code, Rule 02.06.24
http://adminrules.idaho.gov/rules/2001/02/0624.pdf

Montana – Order MTQ-2013-01
http://agr.mt.gov/agr/Programs/PestMgt/quarantines/

Nevada – Administrative Code, Chapter 554.162 through 554-220
http://agri.nv.gov/Resources/Regulations/Nursery/

Oregon – Administrative Rules, Chapter 603, Division 52, Section 603 -52-0127
http://arcweb.sos.state.or.us/pages/rules/oars_600/oar_603/603_052.html

Utah – Administrative Code, Rule R68-15
http://www.rules.utah.gov/publicat/code/r068/r068-015.htm
Washington – Administrative Code, Title 16, Chapter 470, Section 16-470-700 through 19-470-720
http://apps.leg.wa.gov/wac/default.aspx?cite=16-470

Category 2 States with established quarantines
Alabama – Administrative Code, Chapter 80-10-4
http://www.alabamaadministrativecode.state.al.us/docs/agr/McWord10AGR4.pdf
Colorado - Code of Colorado Regulations, Number 8 CCR 1203-21
https://www.colorado.gov/pacific/sites/default/files/Rules%20for%20Nursery%20Program%20-%20Japanese%20Beetle%20Quarantine.pdf
New Mexico – Administrative Code, Title 21, Chapter 17, Part 27 Section 21.17.27.1 through 21.17.27.12
http://www.nmda.nmsu.edu/entomology-nursery/plant-quarantines/

Regulated Articles and Host Commodities

- **Soil, humus, compost, manure,** and all **growing media** (except when commercially packaged)
- **All plants with roots** (except bareroot plants free from soil). Free from soil means plants with less the amount of soil or growing media that can harbor any life stage of Japanese beetle (egg, pupa, or larva). Some states define this as free from soil or growing media larger than ½ inch.
- **Grass sod**
- **Plants with crowns or roots for propagation** (except when free from soil)
- **Bulbs, corms, tubers, and rhizomes** of ornamental plants (except when free from soil)
- **Any other plant, plant part, article, or means of conveyance** when it is determined by the receiving to present a hazard of spreading live Japanese beetle due to infestation or exposure to infestation by Japanese beetle.

Responsibilities of the Place of Production

A. Training

The participant shall educate and train appropriate personnel on the following:

1. Recognizing basic signs and symptoms of the Japanese beetle
2. The stipulations of this compliance agreement
3. The requirements of the most current version of the U.S. Domestic Japanese Beetle Harmonization Plan

B. Pest Management Plan

The Harmonization Plant provides several options for the shipment of regulated articles from Japanese beetle infested areas to states that are uninfested or partially infested.

Note that several states (listed below) have requirements that differ from those detailed in the Harmonization Plan. Please indicate where you intend to ship and which condition you are planning to employ by checking all of the appropriate boxes below.

☐ **Shipment to Category 1 States**

Regulated articles may be shipped to **Category 1** states based on the conditions detailed in the U.S. Domestic Harmonization Plan (Harmonization Plan).

☐ Production in an Approved Japanese Beetle Free Greenhouse/Screenhouse
☐ Production During a Pest Free Window
☐ Application of Approved Regulatory Treatments

- ☐ Detection Survey for Origin Certification
- ☐ Adult Japanese Beetle Mitigation

☐ **Shipment to Category 2 States**

Regulated articles from any infested area may be shipped to **Category 2** states under any of the certification protocols outlined in the Harmonization Plan for shipment to **Category 1** states, or any of the protocols described in the Harmonization Plan for shipment to **Category 2** states which include:

- ☐ Application of Approved Regulatory Treatment
- ☐ Japanese Beetle Nursery Trapping Program
- ☐ Field Grown Nursery Stock Accreditation Program
- ☐ Containerized Nursery Stock Accreditation Program
- ☐ Shipment of Sod (specific requirements for sod)
- ☐ Adult Japanese Beetle Mitigation

States with additional Japanese beetle requirements

- ☐ Colorado
  - Containers over 16 inches in diameter are not eligible for Container Nursery Stock Accreditation Program
  - Media incorporation may not be used as a means of certification
- ☐ Idaho
  - Drench treatments are not approved for shipments of grasses and/or sedges
  - Dip treatments are not approved for B&B stock
- ☐ Montana
  - Shipments must arrive outside of the Japanese beetle flight season (October 1st – May 31st)
  - Shipments of field grown nursery stock are prohibited entrance during the period of June 1st – September 30th annually unless shipped under a bonded compliance agreement with the Montana Department of Agriculture
- ☐ Nevada
  - Advanced notification is required for regulated articles which have been treated with a pesticide
- ☐ Oregon
  - Drench treatments are not approved for shipments of grasses and/or sedges
- ☐ Utah
  - Drench treatments are not approved for shipments of grasses and/or sedges

Treatments

Please refer to the Harmonization Plan Appendixes or the destination state's quarantine for a list of approved treatments.

Contact your inspector in advance if official verification of any regulatory treatment is required.

C. Internal Verification

Inspection/Pest Monitoring

- The nursery must visually inspect plant material for the presence of JB adults prior to and while loading, and follow adult mitigation certification requirements listed in the Plan, when applicable.
- The nursery shall allow the *<State Department of Agriculture>* access to conduct inspections and, if necessary, collect specimens or samples of damage for identification.

D. Traceability

Advanced notification from the following states is required: California, Colorado, Idaho, Montana, Nevada, Oregon, Utah, and Washington

E. Record Keeping

- All regulatory treatments records must be identified in pesticide application log.
- Record of regulatory treatments must be maintained for a minimum of 3 years.
- Records of plant material shipped under this agreement must be maintained for a minimum of 3 years
- Applicable Training Records
- Pesticide Application Records

Responsibilities of the state department of agriculture

- <State department of agriculture> may witness regulatory treatments as needed for certification
- <State department of agriculture> will issue required certification with required additional declarations to be used for shipments of regulated articles covered by this agreement.
- <State department of agriculture> may make periodic inspections to verify compliance with the agreement.
- <State department of agriculture> may conduct periodic inspections of stock being loaded for shipment and the shipping areas may be made to assure compliance with this agreement, and freedom from infestation by Japanese beetle

APPENDIX 11
TREATMENT TABLE

Chemical Treatments Table for Japanese Beetle Harmonization Plan

APPENDIX 12
DEFINITIONS

These definitions apply throughout the plan, unless otherwise noted.

Additional Declaration (AD) – A statement that is required by an importing/receiving state or country to be entered on a Phytosanitary certificate or equivalent certificate of compliance, which provides specific additional information on a consignment in relation to regulated pests.

Approved growing media – Approved growing media used must be free from soil, and consist of synthetic or other substances (other than soil) used singly or in combinations. Examples of approved growing media include pine bark, hardwood bark, expanded or baked clay pellets, expanded polystyrene beads, floral foam, ground coconut husk, ground cocoa pods, ground coffee hulls, ground rice husk, peat, perlite, pumice, recycled paper, rock wool, commercially processed sand, sawdust, sphagnum, styrofoam, synthetic sponge, vermiculite, and volcanic ash or cinder.

The media shall contain only substances that were not used previously for growing plants or other agricultural purposes. It must be free of plant pests, and related matter, and safeguarded in such a manner as to prevent the introduction of all life stages of Japanese beetle to the media.

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.

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

Bareroot – Rooted plants that are apparently free of soil or growing media. Clumps of soil or growing media must be less than ½" in diameter.

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; 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.

The Talstar label also provides tables and formulas for determining amount of pesticide to be blended into the potting media.

CEPM – Committee of Experts on Phytosanitary Measures, a subcommittee within the IPPC.**Certificate** - An official document which attests to the phytosanitary status of any

consignment affected by phytosanitary regulations. This may include:**Phytosanitary Certificate or equivalent document –** for the purpose of verifying compliance with phytosanitary 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. [NPB, 1995].

Complete Saturation – The complete saturation of soil or container substrate during a dip treatment of nursery stock with an approved insecticide treatment requiring a minimum of 2 minutes of immersion in the solution, and has been accomplished once bubbling of air ceases from the root ball.

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

Delimitation(ing) Survey – Survey conducted in an area to establish the boundaries of an area considered to be infested by or free from a pest. [FAO, 1990].

Detection Survey – Survey to be conducted in an area to determine if pests are present [FAO, 1990, revised FAO, 1995].

FAO – Food & Agriculture Organization of the United Nations.

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.

Harmonization – The establishment, recognition and application by different countries [or states] of phytosanitary measures based on common standards [FAO, 1995; revised CEPM, 1999; based on the World Trade Organization Agreement on the Application of Sanitary and Phytosanitary Measures].

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 a regulatory official, to present a hazard of spreading live Japanese beetle either because of infestation or exposure to infestation by Japanese beetle.

ICPM – Interim Commission on Phytosanitary Measures, a subcommittee within the IPCC.

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

Inspection – Official visual examination of plants, plant products or other regulated articles to determine if pests are present and/or to determine compliance with phytosanitary regulations [FAO, 1990; revised FAO, 1995, formerly inspect].

Interception (of a pest) – The detection of a pest during inspection or testing of an imported consignment [FAO, 1990; revised CEPM, 1996].

IPPC – International Plant Protection Convention.

Monitoring Survey – Ongoing survey to verify the characteristics of a pest population [FAO, 1995].

NPB – National Plant Board.

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].

Origin (originate) – grown at the certified facility for a period of time that is at least one growing cycle for greenhouse grown plants and one growing season for field and container grown plants.

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].

Political Subdivision – Any division of a State's government that has been delegated by the State the right to exercise part of that State's sovereign power. Political subdivisions of states or provinces include counties, parishes, cities, townships or municipalities.

Quarantine Pest – A pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled [FAO, 1990; revised FAO, 1995; IPPC, 1997].

Regulated Political Subdivision – An area into which, within which and/or from which plants, plant products and other regulated articles are subjected to phytosanitary regulations or procedures in order to prevent the introduction and/or spread of quarantine pests or to limit the economic impact of regulated non-quarantine pests [CEPM, 1996; revised CEPM, 1999; ICPM, 2001].

Regulated Article – Any plant, plant product, storage place, packaging, conveyance, container, soil and any other organism, object or material capable of harboring or spreading pests, deemed to require phytosanitary measures, particularly where interstate transportation is involved [adapted from FAO, 1990; revised FAO, 1995; IPPC, 1997]. For the purposes of this Plan, it means plants and associated soil, humus, compost, manure, mulch, and plant litter.

Regulated Non-quarantine Pest – A non-quarantine pest whose presence in plants for planting affects the intended use of those plants with an economically unacceptable impact, and which is therefore regulated within the territory of the contracting party [IPPC, 1997].

Sales Location – Every location from which nursery stock or sod 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. Media must be safeguarded from all lifestages of Japanese beetle after sterilization.

Surveillance – An official process which collects and records data on pest occurrence or absence by survey, monitoring or other procedures. [CEPM, 1996].

Survey – An official procedure conducted over a defined period of time to determine the characteristics of a pest population or to determine which species occur in an area. [FAO, 1990; revised CEPM, 1996].

Treatment – Official procedure for the killing, inactivation or removal of pests, or for rendering pests infertile or for devitalization. [FAO, 1990; revised FAO, 1995; ISPM 15, 2002; ISPM 18, 2003; ICPM, 2005].

Weed Free 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 12 inch buffer on both sides of the rootball, then the critical zone will be the 16 square feet immediately surrounding the plant.

APPENDIX 13
REFERENCES

Baumler, R.E. and D.A. Potter. Knockdown, Residual, and Antifeedant Activity of Pyrethroids and Home Landscape Bioinsecticides Against Japanese Beetles (Coleoptera: Scarabaeidae) on Linden Foliage, Journal of Economic Entomology, Vol. 100: 451-458 (2007).

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.

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

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

Mannion, C.M., W. McLane, M.G. Klein, J. Moyseenko, J.B. Oliver, and D. Cowan, Management of Early-Instar Japanese Beetle (Coleoptera: Scarabaeidae) in Field-Grown Nursery Crops, Journal of Economic Entomology, Vol. 94: 1151-1161 (2001).

Mannion, C.M., W. McLane, M.G. Klein, D.G. Nielsen, and D.A. Herms, Insecticide Dips for Control of Japanese Beetle and Other Soil-Infesting White Grubs in B&B Nursery Stock, Journal of Environmental Horticulture, Vol. 18: 89-93 (June 2000).

NAPPO Compendium of Phytosanitary Terms, NAPPO, February 1996.

Oliver, J.B., C.M. Ranger, M.E. Reding, J.J. Moyseenko, N.N. Youssef, and A.M. Bray, Preharvest Quarantine Treatments of Chlorantraniliprole, Clothianidin, and Imidacloprid-Based Insecticides for Control of Japanese Beetle (Coleoptera: Scarabaeidae) and Other Scarab Larvae in the Root Zone of Field-Grown Nursery Trees, Journal of Economic Entomology, Vol. 106: 1190-1199 (2013).

Oliver, J.B., M.E. Reding, M.G. Klein, N.N. Youssef, C.M. Mannion, B. Bishop, S.S. James, and A. Callcott, Chlorpyrifos Immersion to Eliminate Third Instars of Japanese Beetle (Coleoptera: Scarabaeidae) in Balled and Burlapped Trees and Subsequent Treatment Effects on Red Maple, Journal of Economic Entomology, Vol. 100: 307-314 (2007).

Oliver, J.B., M.E. Reding, N.N. Youssef, M.G. Klein, B.L. Bishop, and P.A. Lewis, Surface-Applied Insecticide Treatments for Quarantine Control of Japanese Beetle, *Popillia japonica* Newman (Coleoptera: Scarabaeidae), Larvae in Field-Grown Nursery Plants. Pest Management Science, Vol. 65: 381-390 (January 2009).

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

Potter, D.A and D.W. Held, Biology and Management of the Japanese Beetle, Annual Review of Entomology, Vol. 47: 175-205 (January 2002)

Smitley, D.R., 1994. Container Inspection for Japanese Beetle: A New Approach to Certification. Nursery Business Grower, August 1994. Pp. 6-7.