

# GUIDEBOOK FOR Japanese Beetle

in the Metro Vancouver Region





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	Japanese Beetle Steering Committee and Subcommittees

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# Territorial Acknowledgement

Metro Vancouver acknowledges that the region's residents live, work, and learn on the shared territories of many Indigenous peoples, including 10 local First Nations: áićəý (Katzie), á<sup>w</sup>a:ńλəń (Kwantlen), k<sup>w</sup>ik<sup>w</sup>əλəm (Kwikwetlem), máthxwi (Matsqui), x<sup>w</sup>məθk<sup>w</sup>əýəm (Musqueam), qiqéyt (Qayqayt), se'mya'me (Semiahmoo), Skwxwú7mesh Úxwumixw (Squamish), scəẃaθən məsteyəx<sup>w</sup> (Tsawwassen), and sélílwəta?t (Tsleil-Waututh). Indigenous Peoples have an intrinsic relationship with the natural world, built on reciprocity and stewardship. Many native plants and animals have cultural and spiritual significance for Indigenous Peoples, in addition to being important food and medicine sources. Indigenous communities in BC have collectively called for measures to prevent, manage, and control invasive species due to their negative impact on cultural practices, human health, ecosystems, and the economy. Further collaboration with Indigenous Peoples will deepen our understanding about the impact invasive species, such as Japanese beetle, have on Indigenous ways of life and our shared environment.



CREDIT: JOSEPH BERGER, BUGWOOD.ORG

### Introduction

The impacts of invasive species on ecological, human, and economic health are of concern in the Metro Vancouver region. Successful control of invasive species requires concerted and targeted efforts by many participants. This document - "*Guidebook for Japanese beetle (Popillia japonica) in the Metro Vancouver Region*" - is one of a series of species-specific guides developed for use by practitioners (e.g., local government staff, crews, project managers, contractors, consultants, developers, stewardship groups, and others who have a role in invasive species management) in this region. The best practices and guidance within this document have been applied by many scientific field and operational experts as the result of a multi-year, local response to Japanese beetle. Japanese beetle (*Popillia japonica*<sup>1</sup>) is an established pest in many parts of North America and Europe. It originates from the main island of Japan and was unintentionally introduced to North America in 1916. It is a federally regulated<sup>2</sup> and quarantine pest<sup>3</sup> in Canada under the *Plant Protection Act* and *Regulations*. Japanese beetle was first detected in the False Creek Area of Vancouver, BC in 2017 during routine pest surveillance by the Canadian Food Inspection Agency (CFIA). While it has been detected in the Metro Vancouver region during each consecutive year following the initial detection, Japanese beetle is not yet considered established in BC.

<sup>1 &#</sup>x27;Popillia japonica' is the internationally-recognized scientific name of this insect, while 'Japanese beetle' is the common name recognized by the Entomological Society of Canada (ESC) (Entomological Society of Canada, 2023). The common names of plants or insects frequently include the geographic region or country of origin. The ESC and the Entomological Society of America are both currently reviewing the common name of this insect in response to concerns raised by members of the general public and the scientific community. The common name is often abbreviated and referred to as 'JB'. The scientific name may also be shortened to 'P. japonica'.

<sup>2</sup> A regulated pest in Canada is subject to transport restrictions due to the risk the pest poses if it spreads (CFIA, 2023).

<sup>3</sup> A quarantine pest is a pest of potential economic concern that is not yet present in Canada, or present but not widely distributed, that is being officially controlled (CFIA, 2023).

Within its native habitat, Japanese beetle is controlled by natural predators. In North America, Japanese beetle is a destructive insect, known for its voracious appetite and ability to quickly defoliate plants, damaging landscapes and reducing crop yields. This insect causes severe damage during two life stages - the larval and adult stages. The larvae (also called grubs) feed on fibrous root systems, and prefer turf, but they will also consume roots of other plants if populations are high. The damage caused by larvae will kill grass. The larvae may also attract predators such as raccoons, skunks, and birds, which can cause additional damage to lawns and gardens as they dig and pull up turf looking for the calorie-dense grubs in winter and spring. Adult beetles can cause extensive damage to over 300 types of plants and crops such as elm, maple, rose, apple, grape, zinnia, corn, asparagus, fruit trees (peach, apple, apricot, cherry, and plum), and berries (blueberries, raspberries, and blackberries) (CFIA, 2017).

If it becomes widespread, the Japanese beetle could result in significant crop losses and ongoing management costs for BC's agricultural and horticultural sectors. Given the potential extensive impact of this pest, a variety of prevention and treatment strategies have been implemented in the Metro Vancouver region, including larvicide application and public outreach. The successful eradication of this invasive insect requires collaborative efforts from government, industry, special interest groups, and the general public. Response to the Japanese beetle is critical to protecting the environment and the region's agricultural and horticultural industries. The purpose of this guidebook is to provide a resource for local government staff, landscapers, contractors, land managers, and other practitioners who may be interested in the Japanese beetle story, are involved in the response, or could be involved at some later date. As a comprehensive reference for understanding the beetle's life cycle, potential impacts, and the roles and responsibilities of each organization participating in the collective response, this guidebook can serve as an introduction for staff who are new to the Japanese beetle response in the Metro Vancouver region.

Academic institutions, government, and non-government organizations continue to study this species in BC. As researchers and practitioners learn more about the biology and control of Japanese beetle, it is anticipated that the recommended best practices may evolve. This document will be updated to reflect these changes as the information becomes available. Please check metrovancouver.org regularly to obtain the most recent version of this guidebook.

## Identification

The Japanese beetle belongs to the family *Scarabaeidae*. Unless otherwise noted, the following identification information was collected from CFIA (2022) and ISCBC (2020).

The Japanese beetle life cycle includes four stages - egg, larva, pupa and adult. Unlike many other pests, the Japanese beetle causes damage during two life stages – larva and adult.

**Grubs:** Mature grubs, also called larvae, have a C-shaped cream-coloured body and yellow-brown head with six prominent legs. Several look-a-like beetle grubs, including European chafer beetle grubs, can be found in the Metro Vancouver area. Japanese beetle grubs can be distinguished by the pattern created by fine hairs on their tail end, also known as the 'raster pattern' (Holden, 2018). A microscope is necessary to confirm the species (BC MAF, 2020).

**Adults:** 10 millimetres long and 6 millimetres wide. Metallic green head and thorax, metallic copper-brown wing coverings with six distinct tufts of white hair around each side and back of the abdomen.

**Feeding damage:** Horticulture and crop plant leaves appear skeletonized (lacy and webbed with much of the tissues between leaf veins eaten) indicating the presence of Japanese beetle adults. Brown spots in grassy fields, visible as early as March, may indicate the presence of grubs (CFIA, 2021). The following photos show the Japanese beetle life stages and morphology:



Japanese beetle life stages: egg, 3 stages of larvae, pupa, adult CREDIT: D. SHETLAR



Japanese beetle larval raster pattern CREDIT: D. HOLDEN, CFIA



Adult Japanese beetle CREDIT: JOSEPH BERGER, BUGWOOD.ORG

#### SIMILAR SPECIES

Some species commonly mistaken for Japanese beetle in Metro Vancouver are shown below. Additional look-alikes are pictured in the following fact sheets:

- Japanese beetle Look-Alikes ISCBC
- Japanese beetle CFIA

#### NATIVE SPECIES

• **Ten-lined June beetle** (*Polyphylla decemlineata*) can often be found in sandy soils in BC. Adults are 20 to 35 millimetres long, substantially larger than the Japanese beetle, and they do not cause economic damage to plants (Washington State University, 2023).



Ten-lined June beetle CREDIT: DON LOARIE, FLICKR

• Golden buprestid/metallic wood boring beetle (Buprestis aurulenta) lives on and in dead trees and under the bark on logs (both larvae and adults). These beetles are also metallic green in colour, but are 20 millimetres in length and more elongated than Japanese beetle (ISCBC, 2020).



Golden buprestid CREDIT: GERRY THOMASEN, FLICKR

#### NON-NATIVE SPECIES

• Brown marmorated stink bug (Halyomorpha halys) or 'BMSB' is an invasive insect that was first detected in BC in 2015. It feeds on more than 100 plant species and easily spreads in shipping containers, packing material and vehicles (Government of BC, 2023). BMSB adults are shield-shaped, 13-17 millimetres long with brown mottled colour. They have alternating white markings on the outer edge of the abdomen, and distinctive white bands on the last two segments of the antennae (Government of BC, 2023). Nymphs (immature adults) are black.



Brown marmorated stink bug CREDIT: SUSAN ELLIS, BUGWOOD.ORG

• European chafer beetle (Amphimallon majale), another locally invasive beetle, is brown rather than shiny green like the Japanese beetle, but the European chafer larvae are almost indistinguishable and they live in turf roots as well. The larvae can be differentiated by the arrangement of the hairs on their tail ends (raster pattern) under a microscope. The hairs on the tail of the European chafer grub are arranged in a diverging row of spines, similar to an open zipper. The Japanese beetle raster has only a few hairs that are not arranged in long lines. Note that European chafer causes significant damage only during its larval stage, while Japanese beetle causes damage in both the larval and adult stages.



European chafer beetle larvae (left) and Japanese beetle larvae (right) CREDIT: D. HOLDEN, CFIA



European chafer beetle raster pattern (like a zipper) CREDIT: OHIO STATE UNIVERSITY



Japanese beetle raster pattern



Adult European chafer beetle CREDIT: MICHAEL REDING, USDA AGRICULTURAL RESEARCH SERVICE



Adult Japanese beetle CREDIT: JOSEPH BERGER, BUGWOOD.ORG

### HABITAT

Turf grass is the most frequent host plant of the Japanese beetle larvae, but the roots of other plants may also be targeted (CFIA, 2017). The adult beetles will feed on over 300 plant species, including landscape and ornamental plants, fruits and vegetable gardens, nurseries, orchards and agricultural crops (CFIA, 2017). The Invasive Species Council of BC's Japanese beetle host plants fact sheet lists plants that may be targeted. Adult beetles were found feeding on *Persicaria amplexicollis* plants and roses in David Lam Park in Vancouver, in 2018.



This garden could be suitable habitat for the Japanese beetle (note the surveillance trap in the bottom left corner) CREDIT: D. HOLDEN, CFIA

#### **REPRODUCTION AND SPREAD**

Japanese beetle has four life stages - egg, larva, pupa, and adult. One generation occurs per year. In July and August, a female beetle deposits up to 60 eggs in moist soil, usually in turf, 2-5 centimetres below the surface. Eggs hatch in about two weeks and moisture is needed for egg development. The larvae feed on grass roots through the end of summer and fall, then begin a downward migration deeper into the soil. The larvae spend the winter 5-30 centimetres below the surface, only deep enough to avoid freezing, and can continue feeding on grass roots all winter as temperature allows. Once larvae are fully grown, they pupate in the soil in May or June for two weeks before they emerge as adult beetles. Adult beetles emerge from the soil from June to July and they actively mate and feed on fruit, flowers, and foliage of a variety of plants for 6-8 weeks. In Canada, the beetle flight period typically occurs from June 15 to October 15 annually or when temperatures are above 21° Celsius (CFIA, 2023).



The lifecycle of the Japanese beetle CREDIT: ISCBC

#### **IMPACTS**

The Japanese beetle causes damage during two phases of its life cycle - the larval and adult stages. Larvae feed on the roots of grass, ornamentals plants, shrubs, and garden crops (CFIA, 2022). Damage caused by this feeding reduces the plant's intake of water and nutrients. Infested lawns may die resulting in patches of spongy, brown grass that can be easily pulled up.

Adult beetles are leaf skeletonizers, eating the leaf tissue and leaving the veins behind. Attacked leaves appear like lace that soon withers and dies. The beetles will also feed on flower buds and fruit.

The potential consequences of Japanese beetle establishment in BC include severe damage to nurseries, farms, lawns, landscapes, golf courses, gardens and parks, and negative impacts on BC's horticultural and agricultural sectors (CFIA, 2023). The spread of this beetle would result in increased costs to impacted municipalities, industry and the public due to crop and plant losses and the cost of control measures (Government of BC, 2023).



Persicaria leaf with damage caused by Japanese beetle feeding CREDIT: D. HOLDEN, CFIA BC is the only Category 1<sup>4</sup> Japanese beetle pest-free province in Canada. Establishment of this beetle may result in the loss of BC's Japanese beetle pest-free status and onerous industry requirements to establish and maintain Japanese beetle-free certification programs (CFIA, 2023).

Japanese beetle does not pose a risk to human or animal health or food safety (ISCBC, 2020).

### **CLIMATE CHANGE ADAPTATION**

Climate models predict that the Metro Vancouver region will experience warmer temperatures year round; a decrease in snowpack; longer dry spells in summer months; more precipitation in autumn, winter and spring; more intense extreme events; and an extended growing season. In the past, the region had an average of 252 days in the growing season. In lower elevations, 45 days will be added to the growing season by the 2050s, and 56 days by the 2080s, resulting in nearly a year-round growing season of 357 days on average. In higher elevation ecosystems, the growing season length will increase by 50% to 325 days by the 2080s (Metro Vancouver, 2016). These changes will stress many sensitive ecosystems, increasing their vulnerability to competition from invasive species.

The Japanese beetle may benefit from the region's future climate in several ways:

• Warmer temperatures: Japanese beetle observed in field studies in Illinois, United States showed higher leaf consumption with increasing temperatures up to 37° Celsius, at which point plant mortality increased (Niziolek, Berenbaum, & DeLucia, 2013). This study suggests that elevated temperatures may increase feeding damage by Japanese beetle.

- natural spread from an infested area is not imminent or likely;
- pest impact can only be mitigated to an acceptable level by applying certification programs or protocols;

<sup>4</sup> Category 1 'Uninfested / Quarantine pest' areas have the following characteristics:

<sup>•</sup> Japanese beetle is not known to be established based on annual official surveys;

<sup>•</sup> there is risk of entry via artificial means;

<sup>•</sup> phytosanitary measures are in place to prevent the entry of Japanese beetle; and

<sup>•</sup> an official eradication effort and/or official control measures are put in place for any incursions or incipient populations. (CFIA, 2023)

• Extended growing season: An increase in the number of days in the growing season is associated with an increase in the probability of two Japanese beetle life cycles per year (biannual) in northern latitudes around the world, including parts of Canada (Kistner-Thomas, 2019).

Models by Kistner-Thomas (2019) predict a Japanese beetle northward range expansion across Canada and a southern expansion in the United States in the future.



### NORTH AMERICA REGULATORY STATUS Categories:

- 1 Pest Free Area
- 2 Area of Low Pest Prevalence
- 3 Partially or generally infested
- 4 Not known to be infested

Regulatory status of Japanese beetle in North America CREDIT: CFIA

#### **REGULATORY STATUS**

Japanese beetle is a federally regulated and quarantine pest in Canada under the *Plant Protection Act* and *Regulations*. In line with the federal plant health directive, Phytosanitary Requirements to Prevent the Spread of Japanese Beetle (*Popillia japonica*) in Canada and the United States (D-96-15), regulated areas are implemented to prevent Japanese beetle from spreading into areas where it has not been established. The CFIA currently regulates the movement of 'plants with soil or soil-related matter attached', which are the highest risk pathways for the beetle to spread.

### HISTORY AND DISTRIBUTION

Japanese beetle is an established pest in many parts of North America and Europe. It originates from the main island of Japan and was unintentionally introduced to North America in 1916. Now, the eastern United States and eastern Canada are considered partially or generally infested with Japanese beetle. The Prairie provinces are not considered to be at risk of establishment by Japanese beetle. As of 2023, BC, California, Oregon, and Washington are considered pest-free, as Japanese beetle is not considered 'established' in these areas. BC will maintain its Japanese beetle pest-free status while an eradication response is underway.

In July of 2017, Japanese beetle was detected in David Lam Park in the False Creek area of Vancouver by the CFIA during routine annual surveillance. This was the first time Japanese beetle was found in BC and it is not known how the beetles arrived. Adult beetles are active flyers and can travel on clothing, vehicles, or other methods, and can be transferred through soil and plant movements.

In 2018, a multi-agency Japanese beetle response was initiated (see 'Japanese beetle Response Collaboration' Section for additional information). The following table summarizes Japanese beetle detections and key events in the BC response. Japanese beetle survey reports, including locations of detections in BC, can be found on the CFIA website.

YEAR	# OF JAPANESE BEETLES DETECTED IN BC	DETECTIONS AND KEY EVENTS
2017	958	• Japanese beetle was first detected in BC during routine CFIA surveillance.
2018	8276	The Japanese Beetle Steering Committee and Subcommittees were formed.
		• A Japanese beetle regulated area (RA) was established in Vancouver via Federal <i>Ministerial Order</i> . Plants with soil and soil related matter attached, green waste and soil alone required CFIA permission to be moved out of the regulated areas.
		• The CFIA issued a Notice to Treat public lands within the RA.
		• 2088 traps were deployed across BC's Lower Mainland.
		• Several beetles were found west of the RA. One beetle was detected in Delta.
2019	1157	• The RA was expanded to include Stanley Park and Kitsilano Point in Vancouver.
		• The CFIA issued a <i>Notice to Treat</i> public lands within the RA.
		• The number of beetle detections declined, indicating the efficacy of treatment.
2020	214	• The Government of BC issued a <i>Notice to Treat</i> public lands within the RA.
		• Two beetles were found outside the RA - one in Vancouver and one in Port Coquitlam.
2021	79	• The Government of BC issued a <i>Notice to Treat</i> public lands within the RA and areas outside the RA where the beetle was detected in Burnaby and Vancouver.
		• 50 beetles were detected outside the RA in Vancouver, Burnaby and Port Coquitlam, suggesting at least two new satellite populations had established in Burnaby and Vancouver.
2022	201	• The Vancouver RA was expanded and a new RA was created in Burnaby.
		• The Government of BC issued a <i>Notice to Treat</i> public lands at and near detection sites in Burnaby, Vancouver, and Port Coquitlam.
		• Over 5800 surveillance traps were deployed across BC's Lower Mainland.
		<ul> <li>Beetles were detected outside existing RAs, in Burnaby, Port Coquitlam, Richmond, and Vancouver.</li> </ul>
2023	643	• The Vancouver and Burnaby RAs were expanded in those cities. A new Japanese beetle regulated area was created in Port Coquitlam and Coquitlam.
		• The 2018 Federal Japanese beetle Ministerial Order was revoked. Only 'plants with soil and soil related matter attached' required CFIA permission to be moved out of the regulated areas.
		• The Government of BC issued a <i>Notice to Treat</i> public lands at and near detection sites in Burnaby, Vancouver, and Port Coquitlam.
		• Beetles were detected outside existing RAs, in Burnaby, Port Coquitlam and Vancouver.

## Japanese Beetle Response Collaboration

In 2018, it was determined that no one organization held the key to eradication success and as a result, a multi-agency Japanese beetle response was initiated. Members of the response include the federal, provincial, and municipal governments, along with industry and other stakeholders.

#### COMMITEES AND PARTICIPATING AGENCIES

A Japanese Beetle Steering Committee oversees the response activities and three Subcommittees:

- The **Treatment Subcommittee** develops the treatment plan, including a timeline, locations, and roles. Different approaches are required for public and private lands. This Subcommittee ensures the documentation and mapping of all treatment areas (including private properties). This Subcommittee also provides support for monitoring and surveillance efforts.
- The **Movement Control Subcommittee** provides support for regulations that restrict the movement of regulated articles from the regulated areas to reduce the unintentional human-assisted movement spread of Japanese beetle. This Subcommittee also provides support to the monitoring and surveillance efforts.
- The **Communications Subcommittee** leads coordinated communications efforts to ensure that industry, members of the public, and users of public spaces are informed about regulated areas, movement restrictions and eradication efforts.

These committees collaborate with each other and provide information for interested organizations and the public. Experts and representatives from many agencies participate in the Subcommittees, including:

• The **Canadian Food Inspection Agency (CFIA)** – The CFIA oversees Japanese beetle surveillance efforts with pheromone traps each summer to understand where the beetles are located and to determine if treatments are effective. It also implements movement restrictions and guidelines for plants with soil attached originating from the regulated areas in BC, issues movement certificates, and accepts reports of Japanese beetles or feeding damage.

- The BC Ministry of Agriculture and Food (BC MAF or 'The Government of BC') – The Government of BC is leading the coordinated effort to eradicate Japanese beetle in cooperation with the response members. The Government of BC may issue Notice to Treat orders on public and private lands, as required, and coordinates treatment plans with municipalities, the CFIA, licensed pesticide applicators, private property owners, and others.
- Municipal governments (the Cities of Vancouver, Burnaby, Port Coquitlam, Coquitlam and Richmond) – Impacted local governments are responsible for treating public lands within their jurisdictions. The Cities of Vancouver, Burnaby, Port Coquitlam, and Richmond have implemented programs to respond to varying levels of Japanese beetle presence in their respective jurisdictions.
- Metro Vancouver Metro Vancouver is a federation of 21 municipalities, one electoral area, and one treaty First Nation that collaboratively plans for and delivers regionalscale services, including drinking water, wastewater, solid waste, and air quality management, regional growth planning, regional parks, and affordable housing. Metro Vancouver is involved in the Japanese beetle response to support coordination across the region regarding solid waste and invasive species management.

- The BC Landscape and Nursery Association (BCLNA) The BCLNA provides industry perspective and outreach to its members who are or may be directly impacted by the Japanese beetle response. Members include landscape trades, garden centres, wholesale and retail nurseries, suppliers and others.
- The Invasive Species Council of BC (ISCBC) The ISCBC is a registered charity that works in collaboration with local partners, governments, and businesses with the goal of reducing the introduction and spread of invasive species across BC. At the request of governments and industry, the ISCBC is serving as project facilitator for multi-agency planning, meeting, and information exchange across government and non-government stakeholders involved in the Japanese beetle response.

Other organizations have provided funding, letters of support, and other contributions to the collaborative effort:

- The **BC Agriculture Council (BCAC)** BCAC is an industry advocate for agricultural sector priorities in BC, and a stakeholder in the collaborative response.
- The BC Plant Protection Advisory Council (BCPPAC)

   The BCPPAC provides a forum to address plant health and plant quarantine issues of concern to BC. The BCPPAC Japanese Beetle Technical Advisory Committee (JB TAC) has provided annual scientific recommendations regarding surveillance activities, treatment activities and movement restrictions since 2018. The BCPPAC JB TAC also provided a review of a biocontrol project proposed by Agriculture and Agri-Food Canada in 2022.
- The Canadian Agricultural Partnership (CAP) From 2018 until 2023, CAP has been a federal, provincial, and territorial government initiative intended to strengthen and grow Canada's agriculture, agri-food and agribased products sector. CAP has provided funding to the Japanese beetle response since 2018. In 2023, CAP was replaced by the Sustainable Canadian Agricultural Partnership (Sustainable CAP), which is in effect until 2028.

- The Invasive Species Council of Metro Vancouver (ISCMV) – The ISCMV is a regional invasive species organization that delivers education and support to land managers within the Metro Vancouver region working on invasive species management. The ISCMV provides public education and Japanese beetle training to government staff working in regulated areas.
- The Investment Agriculture Foundation of BC (IAF)

   The IAF provides funding opportunities to support BC's agriculture and food sectors. This foundation has provided support and funding to the Japanese beetle response since 2018.
- Contracted treatment applicators The BC MAF has contracted several experienced treatment companies to support the Japanese beetle response effort by providing services for private lands.

In the future, if beetles are detected in additional jurisdictions via annual surveys, impacted organizations will be invited to participate in the collaborative effort and become members of the Japanese Beetle Steering Committee and/or Subcommittees.

### ANNUAL CALENDAR OF ACTIVITIES

The activities associated with the Japanese beetle response align with its lifecycle. The following table highlights major annual events in the Japanese beetle response in Metro Vancouver, although it should be noted that treatment timing is both weather and temperature dependent.

MONTH(S)	ACTIVITIES	
Year-round	• Movement certificates are issued by the CFIA, as needed, as per federal requirements for the regulated areas.	
	• Outreach and awareness activities take place based on identified needs.	
January	Planning for the upcoming season continues for all response members.	
	• Work plans for Japanese beetle-focused seasonal staff (e.g., ISCBC ambassadors and CFIA students) are developed.	
	• New treatment applicators are recruited, as needed, by the BC MAF and impacted municipalities.	
February	Hiring process for Japanese beetle seasonal staff begins.	
	• BC MAF designates treatment areas and issues treatment orders, as needed, based on previous-year surveillance results.	
March	• The BC MAF allocates treatment areas to treatment applicators, as needed, based on previous-year surveillance results and in consultation with impacted municipalities.	
	• Websites and communications products are updated, as required.	
April	• Federally regulated movement restrictions are updated publicly, as needed, based on previous-year surveillance results.	
	• The CFIA begins Japanese beetle surveillance (trap deployment) in BC's Lower Mainland.	
	Provincially-led training session for applicators.	
	• Required public land treatments begin, as required and weather permitting.	
	• Voluntary private land treatments begin, as required and weather permitting.	
	• The BCLNA hosts a technical training session for landscapers working in the Japanese beetle regulated areas.	
May	• Training programs launch for both federal and municipal staff, in addition to, contractors, as needed.	
	Treatment applications continue, as required and weather permitting.	

MONTH(S)	ACTIVITIES
June	• June 15 - the adult Japanese beetle flight period officially starts in Canada.
	• The CFIA begins checking traps; traps are checked every 1-3 weeks during the adult Japanese beetle flying season (June 15 to October 15).
	• If present, adult beetles may begin to emerge and/or become caught in traps.
	• Treatments applications continue, as required and weather permitting.
July	The CFIA changes lures at the start of July.
	• Treatments usually finish by mid-July, when turf becomes too dry to treat.
	• If present, adult beetles may be caught in traps.
August	The CFIA change lures a second time in mid-August.
	If present, adult beetles may be caught in traps.
September	If present, adult beetles may be caught in traps.
	• The BC MAF designates or updates treatment areas and issues treatment orders, as needed, based on
	current-year surveillance results.
	• Public land treatments may take place, as required and weather permitting, based on current-year
	surveillance results.
October	October 15 - the adult Japanese beetle flight period ends in Canada.
	If present, adult beetles may be caught in traps.
	The CFIA retrieves traps after the flight period ends.
November	• Surveillance data is compiled by the CFIA and the results are shared with the committees.
	• ISCBC facilitates an annual Japanese beetle season wrap-up meeting to review response activities and
	collectively propose actions for the following season.
	• Survey results are assessed by the Japanese beetle Steering Committee (including the related
	Subcommittees) and the BC Plant Pest Advisory Committee JB Technical Advisory Committee
	(BCPPAC JB TAC) to determine recommendations for future response actions related to treatment,
December	Planning for next season begins.
	Recommendations are reviewed and, if accepted, implemented,
	<ul> <li>External posting of Japanese beetle survey results on CFIA website.</li> </ul>

## Surveillance

The CFIA is the federal government agency responsible for tracking Japanese beetle presence. Detection data is used in the establishment of the Japanese beetle regulated areas in BC and to inform movement controls. Detection data is also used to inform stakeholders about the efficacy of treatment activities and identify where treatment should be applied.

The CFIA conducts annual surveillance activities during the adult Japanese flight period in Canada, which occurs between June 15 and October 15. Surveys are conducted by placing Japanese beetle traps in a grid formation throughout the Lower Mainland of BC. Traps are concentrated in areas that are considered 'high-risk' and where Japanese beetle has been found. Placement of the traps begins in late April to accommodate the large number of traps deployed. Traps use a lure with a floral and sex pheromone combination that attracts Japanese beetles. Traps are effective at catching beetles and do not pose a risk to humans, pets, birds, animals, or other insects.

Traps have a green and/or yellow wing vane over a funnel that is attached to a collection chamber or bag. Traps are usually placed at ground level, 1-2 metres high, attached to poles, trees, or fences. 'Canopy traps' are also placed high in trees. Several factors determine trap placement, such as location, proximity to previous detections, environmental conditions, and accessibility. Traps are placed to deter interference, vandalism, and intrusion on daily human activities. Each trap has a label or tag attached that explains its purpose and requests it be left alone. Damaged or missing traps should be reported to the CFIA as soon as possible.

During adult Japanese beetle flight season, traps are checked every three weeks. In areas where beetles have been previously detected, traps are checked more frequently. Lures are changed twice per season, typically at the beginning of July and during the middle of August. Beetles collected in the traps are sent for lab analysis and confirmation.

Traps are collected following the end of the Japanese beetle flight period on October 15. Surveillance data is compiled by the CFIA and shared with members of the Japanese beetle response. The results are also made publicly available on the CFIA's website. To access the most up-to-date surveillance data, visit the BC Japanese beetle survey reports.



Example of the traps used in the Japanese beetle surveillance program CREDIT: CFIA



Tag attached to a Japanese beetle surveillance trap

#### REPORTING

The CFIA's Japanese beetle surveillance program is designed to provide robust coverage across BC. Any Japanese beetles observed outside a surveillance trap, and any feeding damage that may have been caused by Japanese beetle, should be reported to the CFIA as soon as possible at **604-292-5742** or BCPF.Japanese.beetle@ inspection.gc.ca. On its website, the CFIA offers additional guidelines on how to submit photographs and collect suspect Japanese beetles.

Residents should be encouraged to become familiar with the Japanese beetle's characteristics and report beetles, suspected feeding damage, and missing or damaged surveillance traps to the CFIA.

## **Movement Restrictions**

Prevention is the most economical and effective way to reduce the spread of Japanese beetle over the long-term. Federal regulations are in effect to prevent the spread of Japanese beetle. Landscapers, groundskeepers, construction crews, practitioners, residents, and others working in areas where Japanese beetle has been detected are required to follow these regulations. Anyone working in a Japanese beetle regulated area should plan ahead to understand how restrictions may impact their work.

#### **REGULATED AREAS**

Under the authority of the federal *Plant Protection Act* and *Regulations*, the CFIA enforces movement restrictions to prevent Japanese beetle spread in BC and maintain BC's Category 1 pest-free status. Movement controls are identified in the plant health directive, which is updated to reflect changes to movement controls based on surveillance data collected. Additional information about the required movement controls, and recommended best practices, can be found in the CFIA's Guidance for the movement of plants with soil or soil-related matter attached that are leaving a Japanese beetle regulated area located in BC. Municipal bylaws and provincial laws must also be followed.

As of May 2023, Japanese beetle regulated areas are in effect in the Cities of Burnaby, Port Coquitlam, Coquitlam, and Vancouver. Considerations when establishing the boundaries of a regulated area include the location of all current and previous years detections, geography, impact to stakeholders, expectations concerning natural and human assisted spread of the beetle, and ease of communication to the public.



Sod is a regulated article CREDIT: SLGCKGC, FLICKR



Bedding plants are a regulated article CREDIT: DIANE DUANE, FLICKR

#### **REGULATED ARTICLES**

'Plants with soil or soil-related matter attached'<sup>5</sup> are Japanese beetle regulated articles. These regulated articles are items that are infested or likely to be infested with Japanese beetle when originating from a regulated area, or items that may be high-risk for the movement of Japanese beetle eggs, larvae, pupae and/or adults.

Examples of **regulated articles** include:

- turf grass, sod, and ornamental grasses;
- annuals, perennials, bulbs, shrubs, and bedding plants;

<sup>5 &</sup>quot;Soil" is defined as the loose surface of the earth in which plants grow, in most cases consisting of disintegrated rock with an admixture of organic matter, including related matter, such as clay, silt, sand, soil minerals, humus, compost, earthworm castings, muck, plant litter and debris, either individually or as a combination of these or other similar materials.

<sup>&</sup>quot;Soil-related matter" is defined as humus, compost, earthworm castings, muck, plant litter and debris, either individually or in combination.

- other plants for planting, including plants grown in commercially produced soil-less growing media, and plants that need to be returned to the original supplier outside of a regulated area;
- potted houseplants (non-commercial) that have been grown outdoors or used as patio plants; and
- plants with roots and soil attached that are intended for disposal.

Items that are unlikely to carry or be infested with live Japanese beetle eggs, larvae, pupae, or adults are considered 'exempted articles' and do not require a CFIA movement certificate.

#### Examples of **exempted articles** include:

- Soil and soil-related matter, when not attached to plants;
- Above-ground plant parts with no soil attached, such as clippings, cuttings, or trimmings;
- Plant waste that has been chipped or ground, and is substantially free from soil<sup>6</sup>;
- Gravel, aggregate, rocks, concrete, asphalt, silt and other types of inorganic construction waste, or combinations of inorganic material that are substantially free from soil;
- Plants, including nursery stock and houseplants, which have been exclusively indoors within a regulated area during the beetles' flight period;
- Below-ground plant root systems, such as roots, dormant bulbs, tubers, corms, or rhizomes that are substantiallyfree from soil;

- Fresh fruits and vegetables for consumption; and
- Regulated articles transiting through the regulated area without stopping within a regulated area.

Any person or business who violates the prohibitions or restrictions of movement related to Japanese beetle may be subject to a fine and/or liable to prosecution in accordance with the CFIA's Compliance and Enforcement Policy.

#### **MOVEMENT CERTIFICATES**

The movement of regulated articles <u>into</u> or <u>within</u> regulated areas is permitted, and therefore no movement certificate is required. A CFIA-issued movement certificate is required **year-round** to move regulated articles <u>out</u> of a Japanese beetle regulated area.

To obtain a movement certificate, an application form must be completed. The CFIA will assess the application and determine whether a movement certificate is required. Anyone who is unsure whether a movement certificate is required, may request a CFIA site assessment by calling 604-292-5742 or emailing BCPF.JapaneseBeetle@inspection.gc.ca.

When issued, a movement certificate will list a set of conditions that must be followed to mitigate the risk of spreading the beetle from a regulated area to a pestfree area. Agencies may apply for an annual multi-use movement certificate on behalf of all staff at the agency to accommodate multiple worksites and frequent work within the regulated area. These certificates require a movement control log to record the movement of all regulated articles outside of a regulated area. Logbooks or records may be subject to audit by the CFIA.

<sup>6</sup> Articles are considered "substantially free from soil" when the articles have been cleaned, brushed, shaken and/or washed, and the maximum size of any individual clump of soil remaining on the material is less than 12.7 millimetres in diameter (CFIA, 2023).



This map shows where Japanese beetle regulated article movement is permitted and where movement is restricted<sup>7</sup> CREDIT: CFIA

<sup>7</sup> The regulated areas shown in this map are from 2023. Please check the CFIA's interactive map to confirm the current regulated areas.

#### STANDARD OPERATING PROCEDURES

Practitioners play an important role in preventing the unintentional human-assisted spread of the Japanese beetle and they can help to protect organizations that could be negatively impacted. To reduce the risk of further spreading Japanese beetle and other invasive pests or plant diseases, changes to standard operating procedures (SOPs) may be necessary. For example, the City of Burnaby has SOPs for handling green waste, parks operations (securing material, cleaning, etc.), and for movement of regulated material outside parks. It is recommended to review SOPs on a regular basis with staff and contractors.

#### **BEST MANAGEMENT PRACTICES**

Practitioners should consider following best management practices, such as:

- Leave soil and plant waste on site whenever possible.
- Mulch or compost plant waste within the same regulated area.
- Keep a map of the regulated areas in crew vehicles or have it handy for easy reference on a mobile device.
- When possible, use the green/compost bins that are picked up by your city to dispose of regulated plant waste that is substantially-free from soil, such as pruning waste, grass clippings, leaves, weeds, or spent flowers. Municipal requirements for green bins must still be followed.
- Leave root balls and below-ground parts in the ground, and dispose of the above-ground portion, as needed, and in accordance with current regulations.
- Clean all soil from boots, clothing, equipment and tools, including lawn mowers, rakes, shovels, trimmers, wheelbarrows, brooms, etc., before going to another site or leaving a regulated area. Aerating and power raking equipment presents a significant risk for carrying Japanese beetle at various life stages, so avoid using this equipment within the regulated areas as much as possible.

- Check for Japanese beetle hitchhikers on clothing, footwear, tools, equipment, and vehicles.
- Prior to leaving a regulated area, and before leaving a disposal facility, sweep out tarps, grass catchers, and vehicles (e.g., truck boxes, containers, dump trucks) used to transport regulated material, where possible.
- Ensure loads have been adequately covered / tarped to prevent Japanese beetles from flying out. This video demonstrates how to property tarp a load.
- From June 15 to October 15, shake plants to remove any Japanese beetles prior to disposal or prior to loading it into your vehicle for transport to a CFIAapproved disposal site (CFIA, 2023).

## Disposal

Improper disposal of regulated articles and other items can be a potential pathway for Japanese beetle movement.

# ON SITE DISPOSAL AND SEPARATION OF PLANTS FROM SOIL

When working in a regulated area, plants should be separated from soil before disposal, and soil and plant material should be kept on site whenever possible. If possible, root balls and below-ground plant parts should be left in the ground. Plant waste should be mulched or chipped on site or composted within the same regulated area.

Commercial landscapers working in regulated areas should use the customers' green bins for any yard trimmings. Municipal requirements for green bins must be followed.

Plants with soil or soil-related matter attached do not require a movement certificate if they are staying on site, within a Japanese beetle regulated area.

#### OFF SITE DISPOSAL OF REGULATED ARTICLES

Regulated articles may need to be taken off site for disposal outside of a Japanese beetle regulated area. Before moving these items, a CFIA-issued movement certificate is required. All regulated articles must be treated or disposed of in a CFIA-approved manner, such as heat treatment, composting or deep burial. CFIA approval is required prior to using any new treatment or disposal options. The CFIA's guidance document provides more information.

### Treatment

Treatment application can be highly effective in reducing beetle populations. Within the original Japanese beetle regulated area in Vancouver, the total number of Japanese beetles detected each year has decreased by over 97% since 2018, confirming the efficacy of current treatment methods.

The BC MAF is leading the Japanese beetle response's treatment program. Based on data provided by the CFIA, and with the support of impacted municipalities and private licensed treatment applicators, the BC MAF coordinates treatment of private and public lands. When one Japanese beetle is detected, the Government of BC may issue a *Notice to Treat* public or private lands at and around the detection site(s). Public lands include parks, boulevards, and other provincially or municipally-maintained sites that have turf grass or other Japanese beetle host plants. Private lands include residences, stratas, commercial properties, horticulture nurseries, and agricultural production sites that are privately owned. Treatment areas are not always within regulated areas, particularly if Japanese beetles have not been previously detected at the site.



Surveillance trap attached to a tree CREDIT: D. HOLDEN, CFIA

Pesticides (e.g., herbicides, insecticides, fungicides) are regulated by the Federal and Provincial governments, and municipal governments often have pesticide bylaws.

- Health Canada evaluates and approves chemical pest control products as per the Pest Control Products Act.
- The BC Integrated Pest Management Act sets out the requirements for the use and sale of pesticides in BC. This Act is administered by the BC Ministry of Environment and Climate Change Strategy.
- Several municipalities have adopted bylaws that prohibit the use of certain pesticides.

Everyone who uses pesticides must be familiar with all relevant laws.

#### PESTICIDE USE

When a treatment order is issued, it will identify the pest control product that should be used, as well as what to treat and when. Treatments are applied with ground equipment by trained and licensed applicators and contractors, in accordance with the federal Pest Management Regulatory Agency standards. The site characteristics, goals and objectives are considered when a pesticide is prescribed in accordance with legal requirements.

The use of pesticides is highly regulated in BC. This summary of BC's Integrated Pest Management Act provides general guidance on the use of pesticides in BC, while Schedule 2 of the BC Integrated Pest Management Regulation identifies exceptions for pesticide use.

#### PESTICIDE LICENCE AND CERTIFICATION

A valid pesticide licence is required to:

- offer a service to apply most pesticides;
- apply most pesticides on public land including local government lands<sup>8</sup>; and
- apply pesticides to landscaped areas on private land, including outside office buildings and other facilities.

Pesticide licence holders are required to obtain a pesticide applicator certificate in the appropriate category. To determine which certificate category is required for the intended pesticide uses, refer to the Provincial Pesticides & Pest Management webpage or contact Integrated Pest Management program staff as noted below.

Applicators are required to have a valid 'landscape' category of pesticide use licence to apply pesticide for Japanese beetle treatment. Personnel supervising or monitoring pesticide application contracts should also maintain a pesticide applicator licence. Assistant applicator training is also available and the online course and exam are free.

For more information on how to obtain a licence, and the requirements when working under the provincial *Integrated Pest Management Act* and *Regulation*, please review the Noxious Weed & Vegetation Management section on gov.bc.ca/PestManagement.

<sup>8</sup> on up to 50 ha/year by a single organization. Organizations looking to treat over 50 ha of land per year are also required to submit a Pest Management Plan and obtain a Pesticide Use Notice confirmation.

ONLY companies or practitioners with a valid Pesticide Licence and staff who are certified applicators (or working under a certified applicator) may apply pesticide on invasive species located on <u>public lands</u> in BC. Applicators must be either the land manager/owner or have permission from the land manager/owner prior to pesticide application.

Questions? Contact the BC Integrated Pest Management Program:

Telephone: (250) 387-9537

Email: bc.ipm@gov.bc.ca

#### PESTICIDE LABELS

Individual pesticide labels must always be reviewed thoroughly prior to use. This will ensure precautions, application rates, and all directions (related to use, specific site and application methods), are strictly followed. Under the federal Pest Control Products Act and the BC Integrated Pest Management Regulation, persons are legally required to use pesticides only for the use described on the label and in accordance with the instructions on that label. Failure to follow label directions could cause damage to the environment, create poor control results, or pose a danger to health. Disobeying laws and regulations may lead to the cancellation or suspension of a licence or certification, a requirement to obtain a qualified monitor to assess work, additional reporting requirements, a stop work order, or prohibition from acquiring authorization in the future. A conviction of an offence under legislation may also carry a fine or imprisonment.

Pesticide labels include information on both the front and the back. The front of the label typically includes the trade or product name, formulation, class, purpose, registration number, and precautionary symbols. Instructions on how to use the pesticide and what to do in order to protect the health and safety of both the applicator and public are provided on the back of the label.

Labels can also be found by using the Pest Management Regulatory Agency's online pesticide label search or mobile application. These label documents may include booklets or material safety data sheets (MSDS) that provide additional information about a pesticide product. Restrictions on site conditions, soil types, and proximity to water may be listed. If the insecticide label is more restrictive than Provincial legislation, the label must be followed.

#### PESTICIDE OPTIONS

Provincial treatment orders state the product to use, along with where and when to apply it. Currently, the product used in the Japanese beetle response in BC is Acelepryn™ (active ingredient *Chlorantraniliprole*). Acelepryn™ is a commercial larvicide that must be applied by licensed applicators. It is applied once per year to turf where Japanese beetle has been detected to target Japanese beetle larvae, which contact or ingest the pesticide while feeding on turf and plant roots. Applications typically occur between April and September. Acelepryn™ controls root-eating grubs and will not harm people, pets, mammals, birds, bees, butterflies or other plants and animals, including any animals that eat the treated grubs. BeetleGONE!<sup>™</sup> is a product that contains *Bacillus thuringiensis* subsp. galleriae (BtG) and can be used to reduce the number of adult beetles present. This product is registered for use in Canada and is available in garden centres. BtG is a naturally occurring bacterium found in soil and plants that can be applied to foliage during the adult Japanese beetle flight period in areas where beetles or feeding damage is detected. Btg is not currently being used as part of the Government of BC's mandated treatment program.

Private lands located within treatment zones may be eligible for free treatment with Acelepryn<sup>™</sup>. If eligible, treatment costs are covered by the Government of BC. Private landowners also have the option of hiring a certified applicator at any time to treat their property. Outside of Japanese beetle treatment zones, landowners may use any registered product for treatment of Japanese beetle at their own cost. Treatments are not needed in areas where Japanese beetle have not been detected or established. Note that the application of pesticides that manage European chafer beetle will also help control any Japanese beetles in the area and vice versa.

#### PESTICIDE APPLICATION METHODS

Ground application on large turf areas is completed with boom sprayers. Application to turf and high risk ornamentals in smaller areas and landscape beds is completed with hose and reel hand sprayers or backpack sprayers (Government of BC, 2023).



Handheld hose application to a turf treatment area in a Vancouver park CREDIT: ISCBC



Boom sprayer application to a turf treatment area in a Vancouver park CREDIT: VANCOUVER BOARD OF PARKS AND RECREATION



Example of signage installed at a treatment area in Vancouver CREDIT: CITY OF VANCOUVER

# Alternative Control Options

Pesticide application continues to be the recommended method of control, but alternative control options are being considered for efficacy towards eradicating the beetle population. The following alternative options have been assessed:

#### MANUAL OR MECHANICAL CONTROL: NOT RECOMMENDED

Manual (e.g., hand digging) or mechanical (e.g., tilling with machinery) control is not effective for control of Japanese beetle in BC. These methods are time-consuming and result in further destruction of lawn and landscaped areas. The likelihood of eradication would be low since every grub present in the soil would have to be removed or killed.

Mass trapping is not an effective Japanese beetle control method. Although traps remove some adult beetles from the environment, they are not effective for population control and have no effect on larvae that may be present. Japanese beetle traps are readily available online and in some local landscape supply stores, but they do not contain the same lures as the traps used by the CFIA during surveillance activities.

If Japanese beetle is detected in a commercially-purchased and privately deployed trap, the beetle(s) should be collected and the CFIA contacted to report the findings (BCPF.Japanese.Beetle@inspection.gc.ca or 604-292-5742).

### CULTURAL CONTROL: NOT AVAILABLE

No references were found in the scientific literature suggesting cultural control practices (e.g., habitat manipulation) for Japanese beetle that are appropriate for the Metro Vancouver region. A cultural method is unlikely to be successful since there are many known Japanese beetle host plants and widespread growth of turf.

#### BIOLOGICAL CONTROL: NOT CURRENTLY AVAILABLE

There are no biological control agents currently available in BC for Japanese beetle, but Agriculture and Agri-Food Canada is researching the use of the Winsome fly (*Istocheta aldrichi*) as a potential biological control method.

Application of parasitic nematodes or microbial larvicides to control European chafer beetle populations may also help control Japanese beetle larvae populations in the area. In other regions where both pests are established, practitioners often manage these beetles using the same techniques, as the life cycles and timing of both pests are similar. Unlike European chafer beetle, which is destructive only during its larval life cycle stage, Japanese beetle causes damage during two life cycle stages (larvae and adults).

Spiders, insects, birds, and medium-sized mammals (e.g., crows, skunks, racoons, etc.) may consume the grubs (and less commonly adult beetles) as a food source. These predators are likely to do additional damage at sites, tearing up lawns and garden beds to seek the grubs.

### Communications & Outreach

Agencies involved in the Japanese beetle response have conducted outreach individually and collectively to promote awareness about the insect's presence in the region and to encourage reporting. Information and communications products have been developed for those directly impacted by detections, living/working within or near a regulated area, and other specific audiences who may have an interest or role in response activities.

Local outreach tools include:

- Signage (road signs, on municipal collections trucks, treatment placards).
- Pamphlets, posters, fact sheets, stickers, temporary tattoos, etc. for in-person distribution at municipal transfer stations, municipal construction permit offices, retail locations, public events, etc. ISCBC has developed Japanese beetle factsheets on yard waste, look-alike species, community gardens, host plants and the response.
- Information cards and letters distributed via Canada Post to landowners in or near regulated areas (information on regulated areas, movement restrictions, or treatment).
- ISCBC Japanese beetle Ambassadors (paid staff) conduct outreach at farmer's markets, home and garden shows, local festivals, schools, master gardener meetings; nurseries/retail locations, tourist destinations, transfer stations, etc. Ambassadors assist the CFIA with trap deployment, maintenance, and monitoring, and are also available onsite during treatment activities on public lands.
- ISCBC videos describing various activities associated with the response (trapping methods, how to tarp a landscape load leaving a regulated area, etc.)

- BCLNA facilitates landscaper and retailer technical education sessions targeted to industry members.
- Social media messaging and online geo-targeted advertising (via municipal waste collection apps and other platforms).
- Agency-specific webpages on Japanese beetle:
  - BCLNA: www.bclna.com/japanesebeetle/
  - CFIA:
    - inspection.canada.ca/JB [English]
    - inspection.canada.ca/SJ [French]
  - City of Burnaby: www.burnaby.ca/japanesebeetle
  - City of Port Coquitlam: www.portcoquitlam.ca/ japanesebeetle
  - City of Richmond: www.richmond.ca/services/ climate/environment/invasivespecies
  - City of Vancouver: www.vancouver.ca/japanesebeetle
  - Government of BC: www.gov.bc.ca/japanesebeetle
  - ISCBC: www.bcinvasives.ca/invasives/japanesebeetle/
  - Metro Vancouver: https://metrovancouver.org/ services/solid-waste/japanese-beetle
- The ISCBC has a Japanese beetle mascot costume that is available for use at outreach events.

Examples of local Japanese beetle signage are show below:



Government of BC info sign used to accompany private land treatments CREDIT: GOVERNMENT OF BC

Entering a Japanese beetle regulated area.	Début d'une zone réglementée pour le scarabée japonais.	
inspection.canada.ca/jb	inspection.canada.ca/sj	
Government Gouvernement	Canadă	

Roadside sign placed at entry points to a regulated area CREDIT: CFIA



Vehicle sign available for jurisdictions participating in the response efforts CREDIT: ISCBC

Existing resources are the best place to start when developing Japanese beetle communications materials. Some resources are available in Simplified Chinese, Traditional Chinese, English, French, Italian, Japanese, Korean, Punjabi, Tagalog and Vietnamese (CFIA, 2022). Other resources may also exist. It is important to consider the audience (government staff, elected officials, contractors, homeowners, public, etc.) when developing outreach materials. Agencies that are part of the Japanese beetle response team are willing to share content and provide support on resource development.

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# Additional Resources

For more information, please refer to the following resources.

Canadian Food Inspection Agency

- Japanese beetle in British Columbia An ongoing response 2018 to 2023
- Guidance for the movement of plants, plant parts and soil leaving a Japanese beetle regulated area located within British Columbia
- Japanese beetle plant pest identification card

Ministry of Agriculture and Food, Government of BC

• Government of British Columbia

#### Local governments

- City of Burnaby
- City of Port Coquitlam
- City of Richmond
- City of Vancouver
- Metro Vancouver

Invasive Species Council of BC

• General information and factsheets

BC Landscape and Nursery Association

- Japanese beetle
- Technical Information for Landscapers

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Questions about detections or surveillance activities (trapping) can be directed to BCPF.Japanese.Beetle@ inspection.gc.ca or 604-292-5742.

All Japanese beetle media queries for the CFIA should be directed to cfia.media.acia@inspection.gc.ca.

To request edits or additions to this guidebook, contact Laurie Bates-Frymel, Senior Planner, Metro Vancouver at 604-436-6787 or laurie.bates-frymel@metrovancouver.org.

