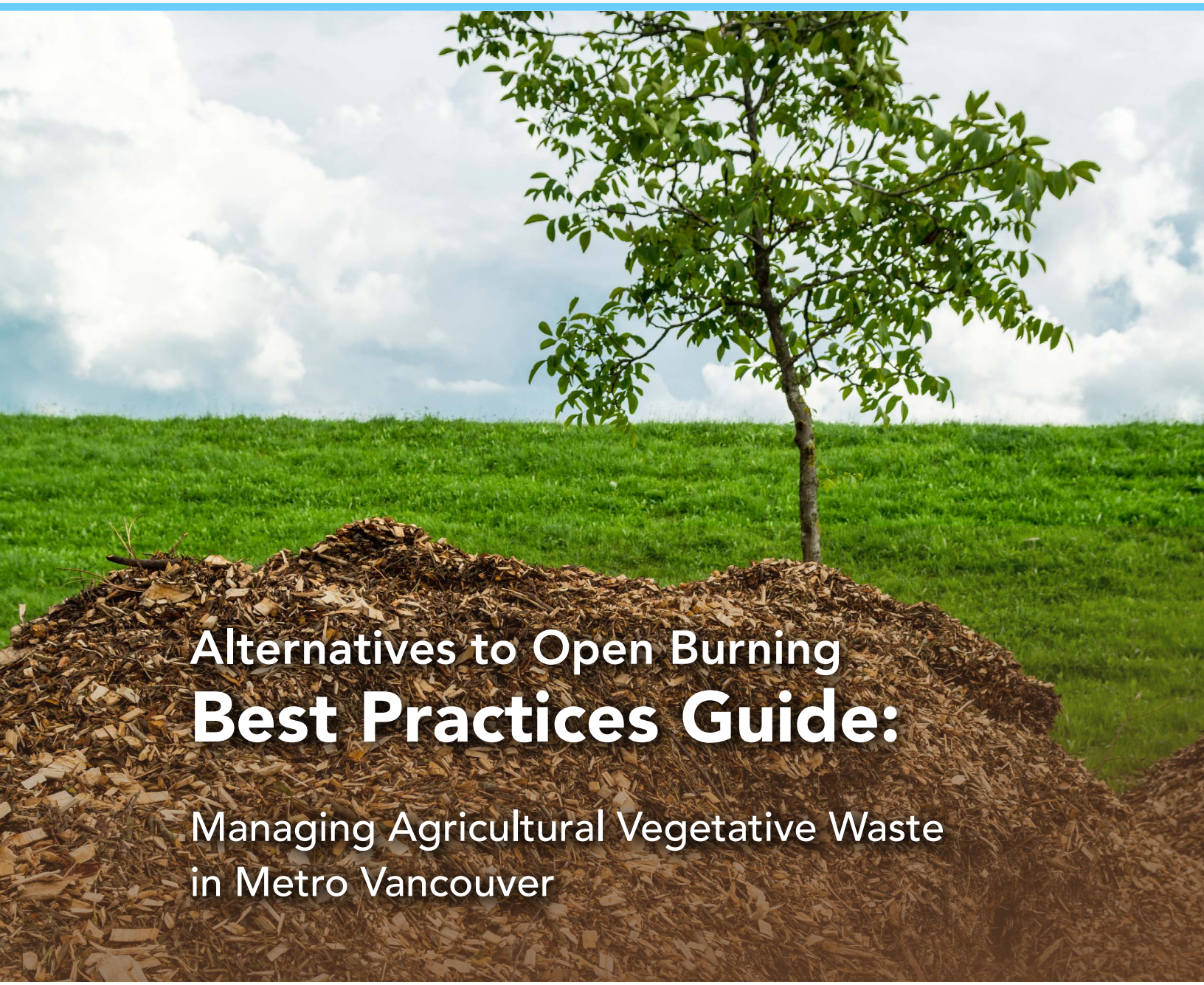


Alternatives to Open Burning

Best Practices Guide:

Managing Agricultural Vegetative Waste in Metro Vancouver

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: Katzie, Kwantlen, Kwikwetlem, Matsqui, Musqueam, Qayqayt, Semiahmoo, Squamish, Tsawwassen, and Tsleil-Waututh.

Metro Vancouver respects the diverse and distinct histories, languages, and cultures of First Nations, Métis, and Inuit, which collectively enrich our lives and the region.

This Best Practices Guide was developed for Metro Vancouver by Upland Agricultural Consulting Ltd. Upland would like to acknowledge the feedback from agricultural producers and industry specialists who provided valuable insight into the creation of this guide. The information in this document was compiled in late 2021.

upland
agricultural consulting

Contents

Purpose

The purpose of the Best Practices Guide is to provide information about alternative practices to open burning of agricultural vegetative waste material, in an effort to reduce air emissions. Guides for specific types of materials are included in an appendix (Appendix III). The guide also includes information that identifies when burning is necessary and how burning can be done safely and efficiently. The guide is tailored towards farm operators who are involved in crop pruning and removal, field renovations, and land or brush clearing on farmland in Metro Vancouver.

Regulatory Context

The Metro Vancouver Regional District consists of 21 municipalities, one Electoral Area, and one Treaty First Nation. Metro Vancouver is responsible for managing air quality in the region and regulating the discharge of air contaminants under authority delegated by the provincial government in the British Columbia Environmental Management Act (EMA). Under Section 31 of the EMA, Metro Vancouver has the delegated authority for air pollution control and air quality management within the Metro Vancouver region, including on agricultural land. The EMA states that the Metro Vancouver Board "may, by bylaw, prohibit, regulate and otherwise control and prevent the discharge of air contaminants."

Metro Vancouver manages air emissions from open burning of vegetative debris by issuing site-specific approvals under the Greater Vancouver Regional District (GVRD) Air Quality Management Bylaw 1082, 2008 (Bylaw 1082) or by authorizing controlled emissions through the Open Burning Emission Regulation Bylaw No. 1355, 2022 (Bylaw 1355). Metro Vancouver's current regulatory requirements with respect to open burning of vegetative debris, set out under Bylaws 1082 and 1355, are in addition to provincial requirements. Bylaw 1355 provides a more streamlined mechanism for the authorization of controlled emissions from open burning of vegetative debris, compared to the approvals process under Bylaw 1082. Bylaw 1355 came into effect on May 15, 2023. To find the most up-to-date and accurate information on how to burn within the law in the Metro Vancouver region, go to Metro Vancouver's Open Burning website.

Most Metro Vancouver jurisdictions have bylaws that include restrictions and conditions on open burning activities. Anybody who wishes to conduct open burning must also comply with local (including First Nation, if applicable), municipal, and fire department requirements. Farms are not necessarily exempt from these local bylaws. For a list of municipal contacts see Table 1 in Appendix I.

Where to find out more about air quality regulations in Metro Vancouver:

- Metro Vancouver Air Quality Regulatory Program
- Applying for an Open Burning Approval

Open Burning Challenges

There are several challenges associated with burning agricultural vegetative waste.

1. **Planning can be time consuming. Steps include:**
   - Checking with Metro Vancouver and municipal contacts to see if, and when, the material can be burned.
   - Developing a burn plan.
   - Applying for, and obtaining, necessary authorizations from Metro Vancouver, municipalities, and fire departments.

2. **Timing the burn to meet necessary conditions can be difficult:**
   - Weather conditions must be appropriate for dispersing smoke (appropriate 'venting') and conducive with fire safety standards for safe burning.
   - The decision of when or where to implement a fire ban is made by the BC regional fire centres depending on local fire hazards or dangers, the type of weather conditions forecasted, and the type and level of fire activity being experienced.

3. **Costs can quickly add up:**
   - There are application fees associated with acquiring permits and approvals for open burning from both Metro Vancouver and municipal governments.
   - There are costs associated with labour required to create a plan, prepare the material, build the pile(s), and supervise and manage the burn.
   - Poor management could result in an uncontrolled fire, with the risk of catastrophic impacts on the farm's operations and surrounding areas and subsequent fines.

4. **The burn may be perceived as socially unacceptable:**
   - With increasing risks of seasonal wildfire, the general public has become much more aware of open burning.
   - Neighbours or people driving past may be sensitive to smoke which may result in negative reactions to the smell and sight of burning.
   - Even if Metro Vancouver and other agencies have granted conditional authorization to conduct a burn, complaints may be received by neighbours or passers-by.
   - Open burning may be perceived by the public to be environmentally irresponsible.

Best Management Practices for Agricultural Vegetative Waste Material

Several on-farm best management practices (BMPs) are available for managing vegetative waste using an alternative to open burning. This document / Metro Vancouver also provides informational flow charts, which can help with best practices decision-making based on crop type (see Appendix III).

BMPs include:

- Chipping, grinding, or shredding
- Mowing

All methods should avoid processing treated or painted wood, including fence posts and agricultural buildings.

Chipping, Grinding or Shredding

Most vegetative material including stumps, field renovation material, root balls, greenhouse crops, orchards, and field crops can be chipped, ground, or shredded and then used on the farm or hauled off-site, if it is not contaminated with plastics or other non-vegetative materials.

The goal of chipping, grinding, and/or shredding is to reduce the overall volume of material and make it easier to handle for beneficial uses on the farm, or for hauling off-farm. The best processing method to choose will depend on the type and size of material. Small woody debris can be chipped, whereas logs and stumps are typically processed in a grinder. A shredder is usually employed to process large amounts of crop waste. The main difference between the equipment used in chipping, grinding, or shredding is the type and size of blades used to do the processing. The machinery can often be attached to a tractor and moved around a farm, or larger-sized equipment can be brought in and installed at a site on the farm for specific jobs.

Cost-Benefit Analysis Example

A farmer has a large volume of woody debris to process and is comparing the costs associated with hiring a contractor to process and remove the material versus renting grinding equipment to do the work themselves and keep the material on the farm:

Contractor's estimated fees:

1. Collecting a bin of vegetative debris and hauling it off-farm: $1,000 per 30 m^3 bin
2. Grinder rental: $5,000 per day

If the total vegetative material exceeds 150 m^3 (5 bins), it is more economical to process the material on site and re-use it on the farm.

Chipping

Chipping is best for small volumes of dry woody debris, such as leaves and branches, that do not contain soil. Chipping may be used during annual property maintenance, tree removal, clearing debris, removing small trees and shrubs, orchard pruning, or blueberry crop management (Figures 2 and 3).

Figure 2. Chipper used for blueberry pruning

Figure 3. Chipper used for orchard management.

Grinding

Grinding is best for larger volumes of large woody debris, and land clearing that produces materials such as stumps and root balls that may contain soil. Grinding may be used during tree removal, orchard pruning, greenhouse or field vegetable crop management, blueberry bush replacement, cranberry crop management, or other crop turnover (Figures 4 and 5). Grinding is best used for dry material, rather than green crop waste.

Figure 4. Large tub grinder for clearing land and orchards.
Photo credit: P. Doig.

Figure 5. Horizontal grinder for crop management.
Photo credit: Biocycle.net

Shredding

Shredding is best for whole plants including branches, green/wet plant material, and vines. Shredding may also be used for crop turnover, cranberry crop management, or field vegetables and berry crops. Shredders can be used over larger areas or in small narrow areas between crop rows (Figures 6 and 7).

Figure 6. Tractor with crop shredder attachment working over a large area.

Figure 7. Shredder working on trimmings in a narrow area.

Chipping, grinding, and shredding equipment can be purchased, rented, or a private contractor can be hired to carry out the work. Producers should ask contractors about the capacity for processing materials on a per hour basis prior to selecting the best equipment. See the Appendix I for a list of local equipment dealers.

Key steps for chipping, grinding, or shredding

- If renting equipment, be sure to read the operating manual of the equipment prior to use.
- Ensure there is a plan for storing any woody residue after processing.
- Remove as much soil and as many stones as possible.
- Place debris in piles for ease of equipment loading.
- With large volumes of debris, a grapple or loader may be required to load the materials into the processing equipment efficiently and safely.
- Use processed material on-farm (as a woody residue resource, mulch, or compost) or have it hauled off-site.

Mowing

Mowing involves processing small-diameter woody debris, such as prunings and field berry or vegetable crop debris, in the field. Mowing is usually followed by mulching, which involves leaving the material in place and/or incorporating it into the soil (Figure 8). Equipment such as flail mowers or bush hogs are attached to a tractor and slowly driven over the materials. The equipment can be purchased or rented, or a private contractor can be hired to carry out the work.

Figure 8. Mowing and mulching a field crop.

Key steps for mowing:

- If renting equipment, be sure to read the operating manual of the equipment prior to use.
- Ensure there is a plan for storing, using, or transporting the debris after processing.
- Distribute material evenly to avoid clogging the flail mower (this could damage mower equipment and the tractor).
- Drive slowly over pruned branches and debris to ensure that large pieces are properly processed. Two or more passes over the materials may be needed to achieve the desired result.
- Leave the material in the field or incorporate it into the soil (see Mulching, below).

Beneficial Uses of Agricultural Vegetative Waste Material

Woody Residue Re-Use

There are several on-farm beneficial uses for woody residue, including:

- Plant mulch or horticultural bedding (Figure 9)
- Soil conditioner or ground cover
- Component of growing media for horticulture
- An input for composting with agricultural by-products
- Confined livestock or poultry areas
- Animal/livestock bedding
- Lining an access way on farmland
- Fuel for wood-fired boilers (subject to Metro Vancouver's Agricultural Boilers Emission Regulation or permits)

Woody residue regulations

Storing, burying, and/or using woody residue is regulated under the Code of Practice for Agricultural Environmental Management (see section on Woody Residue). Residue must not be stored in the field for more than 12 months and must not be stored or applied in areas prone to seasonal flooding or where standing water occurs. Leachate, runoff, solids, or dust from the stored woody residue must not enter a watercourse, cross a property boundary, or go below the water table. If storing woody residue debris on-site for an extended period of time, place on an impermeable surface, cover, and manage leachate, runoff, solids, or dust. See the Code of Practice which identifies both acceptable uses and prohibited uses of wood residue.

Woody residue resources:

- Code of Practice for Agricultural Environmental Management (see section on Woody Residue)
- BC Environmental Farm Plan Reference Guide (see Chapter 2 page 2-40).

Figure 9. Sawdust mulch used on blueberry plants.

Composting

Composting is the process of active decomposition of organic materials at high temperatures. Composting creates a soil amendment and fertilizer that can be reused on the farm. Nearly any agricultural vegetative material can be composted, such as crop waste, grass clippings, or foliage. Composting can occur through the use of static piles, aerated piles in bays (Figure 10) or windrows, or forced aeration. The piles of composting material should be turned or mixed every few weeks (Figure 11). On-farm beneficial uses of adding finished compost (Figure 12) to soil include:

- Increasing organic matter content
- Improving nutrient retention and soil structure
- Suppressing plant diseases within soil

Figure 10. A three-bay composting system.

Figure 11. Turning compost using a tractor.

Key steps for composting:

- Select a type and location of the compost system as directed in the On-Farm Composting Guide.
- The location must be set back from drinking water sources (30 m), water courses (15-30 m), and property boundaries (4.5 m), as outlined within the Code of Practice for Agricultural Environmental Management (Section 17).
- Manage the compost pile or windrow according to directions outlined in the On-Farm Composting Guide for key factors including the C:N (carbon to nitrogen) ratio, moisture content, and temperature.
- Using a compost system to dispose other waste materials, that cannot be burned, such as livestock/poultry mortalities, or agricultural processing waste is acceptable but triggers additional regulations under the Code of Practice for Agricultural Environmental Management (Sections 71-73).

Selling Compost

Selling compost may require a Non-Farm Use approval through the Agricultural Land Commission and/or additional approvals through the Ministry of Environment's Organic Matter Recycling Regulation (OMRR). The Code of Practice for Agricultural Environmental Management and Federal Fertilizers Act and Regulations may also apply. Check about how to proceed by contacting the Agricultural Land Commission as a first step (see Appendix I for contact information).

Compost resources:

Details regarding the composting process and design guidelines are provided in the BC Ministry of Agriculture Food and Fisheries' On-Farm Composting Guide. As per the regulations in the Code of Practice for Agricultural Environmental Management (Sections 25), the piles must not be placed over coarse-textured soil and must be covered from October 1 to April 1.

Figure 12. Finished compost ready for use. Photo credit: Marcy

Mulching

Mulching involves leaving crop debris on the surface of the soil or incorporating it into the top layer (Figure 13). It is often done after mowing, and can benefit the soil in many ways, such as:

- Adding a protective layer to the soil
- Reducing weed growth
- Moderating soil temperature
- Reducing evaporation
- Improving moisture retention

Figure 13. Mulch added to a garlic crop in BC.

Off-Farm Disposal

Off-farm disposal involves transporting vegetative material to a recycling and waste transfer station, a recycling area at a landfill, or to a commercial composting facility. The hauling can be done by the farm operator or through a private contractor. As an optional first step, the materials can be chipped, ground or shredded on the farm. Considerations associated with hauling off-site include:

- Agricultural vegetative waste are not typically accepted by municipal transfer stations therefore arrangements must be made with privately-owned facilities.
- Receiving facilities charge a disposal fee, which can vary depending on waste type and volume.
- Private contractors will charge a hauling fee.

Case Study: Preparing Vegetative Waste for Off-Farm Composting

A Delta greenhouse operation growing vine crops has switched to using biodegradable twine. This allows the farm operator to shred plant material on-site (including twine) and then haul the material to an off-site location for composting.

Figure 14 indicates the locations of facilities that may accept or haul agricultural waste.

Figure 14. Locations of off-site hauling options in the vicinity of Metro Vancouver.

Off-site hauling options within Metro Vancouver are listed in Table 2 in the Appendix I. These facilities can also recommend private contractors to haul material. This information is accurate as of Spring 2023.

Best Practices for Disposal of Invasive Species and Noxious Weeds

Invasive species are plants and animals that have been introduced to an area without the predators and pathogens from their native habitats that would otherwise help keep them in check. They can threaten agriculture as well as the ecological health and diversity of the natural environment. Invasive plants, such as Himalayan blackberry, can negatively impact farming by overwhelming land and choking waterways. Metro Vancouver has created an online resource of Best Management Practices for different invasive species found in the region. Physical management options include hand pulling or mowing followed by on-site desiccation or off-site disposal at specific locations.

Noxious weeds are regulated under law through the *Weed Control Act*, which legally requires land occupiers to control designated plants. Some noxious weeds are also invasive species. For a guide to identifying noxious weeds see the BC Field Guide. Contact the BC Ministry of Agriculture Food and Fisheries for best management options of noxious weeds: 1-888-221-7141.

Invasive species and noxious weeds resources:

- Invasive Species Council of Metro Vancouver
- Invasive Species: Best Management Practices for Practitioners
- Field Guide to Noxious Weeds of BC

Disposal of Diseased Vegetative Debris

There may be situations when open burning is a necessary approach. The most common need to burn in an agricultural setting is to eliminate plant pathogens, diseased plants, or insect infestations. Currently, authorization to open burn must be obtained through the open burning approval application process or following requirements under the Metro Vancouver Bylaw 1355 that came to effect in May 15, 2023 for simplified authorization process.

Information about obtaining authorization from Metro Vancouver can be found on the Open Burning Advisory website. An authorization sets out conditions for burning vegetative material and may include the following key steps:

- In addition to a Metro Vancouver open burning requirements, a permit to burn may also be required from the local municipality and/or fire department (municipal contact information is provided in the Appendix I).
- Diseased or infected debris must be verified as infested by an insect or pathogen listed in OBSCR Schedule 1 by a registered Professional Agrologist, Professional Biologist, Professional Forester or Registered Forest Technician.
- At least half (50%) of the vegetative debris being burned must be diseased.
- Under Bylaw 1355, all occupants within 500 m of the planned burn must be notified no later than 24 hours beforehand. All reasonable effort must be made to inform occupants and managers of all residences, businesses, schools, hospitals and community care facilities.
- Before you burn, determine whether ventilation index and other conditions are favourable for that day by calling Metro Vancouver's open burning advisory phone line 604-436-6777 after 8:30 am.
- The length of the burn should not exceed one day and the burn should finish by the later of 4pm or two hours before the sunset.
- The Metro Vancouver region is within a High Smoke Sensitivity Zone, therefore the burn conditions must comply with minimum distances from residences, businesses, schools and hospitals, ensuring debris has been properly seasoned pile size is appropriate, among other considerations.

The BC Ministry of Environment and Climate Change Strategy has created a fact sheet outlining some of the key steps to plan and prepare for a safe and efficient burn. The equipment required to produce a low-emission burn can be rented from supply companies (see list of equipment suppliers in the Appendix I). Any equipment and burning methods used must also be compliant with the Metro Vancouver authorization.

Air Curtain Burners

Air curtain burners (incinerators) burn vegetative debris in a partially enclosed space with an open top over which a high-speed flow (or 'curtain') of air is directed (Figures 15 and 16). The partially enclosed space can be an above-ground, self-contained unit or an excavated trench. The curtain of air provides additional oxygen to the fire, raising the burning temperature and trapping the smoke. The result is an almost smokeless burning activity, with nearly complete combustion of all debris. Other names are Air Curtain Incinerators, Burn Boxes or Air Curtain Burners. Metro Vancouver Bylaw 1355 sets the requirements for open burning using air curtain technology. The BC Ministry of Environment and Climate Change produces a Factsheet on Air Curtain Incinerators.

Figure 15. Air curtain burner used in crop renovations.

Figure 16. Air curtain burner used at a vineyard.

Appendix I: Contact Information

Government Contact Information

Metro Vancouver

Email: icentre@metrovancouver.org
Phone: 604-432-6200

Ministry of Agriculture, Food and Fisheries

Email: AgriServiceBC@gov.bc.ca
Phone: 1-888-221-7141

BC Ministry of Environment and Climate Change Strategy

Code of Practice for Agricultural Environmental Management: AEMCoPenquiries@gov.bc.ca

Organic Matter and Recycling Regulation (for selling compost): env.omrr.reg.reviews@gov.bc.ca

Agricultural Land Commission

Email: ALC.southcoast@gov.bc.ca

Municipalities

Table 1. Contact information for municipalities within Metro Vancouver.

Municipality	Solid Waste or Engineering Department	Fire Department
Village of Anmore	604-469-6622	604-469-9877
Village of Belcarra	604-937-4100	604-937-4100
Bowen Island Municipality	604-947-2255	604-947-9324
City of Burnaby	604-294-7972	604-294-7195
City of Coquitlam	604-636-3521	604-927-6400
City of Delta	604-946-3260	604-946-8541
Electoral Area A	604-432-6383	604-436-6806
City of Langley	778-765-3662	604-514-2852
Township of Langley	604-530-3939	604-532-7500
Village of Lions Bay	604-921-9333	604-690-4908
City of Maple Ridge	604-463-5545	604-463-5880
City of New Westminster	604-526-4691	604-519-1004
City of North Vancouver	604-681-5600	604-980-5021
District of North Vancouver	604-681-5600	604.990.3682
City of Pitt Meadows	604-465-2434	604-465-2401
City of Port Coquitlam	604-927-5496	604-927-5288
City of Port Moody	604-469-4574	604-469-7795
City of Richmond	604-276-4010	604-278-5131
City of Surrey	604-591-4152	604-543-6700
Tsawwassen First Nation	604-943-9492	604-943-9492
City of Vancouver	604-873-7000	604-873-7000
District of West Vancouver	604-925-7176	604-925-7370
City of White Rock	604-541-2181	604-541-2121

BC's Recycling Hotline

BC's Recycling Hotline provides advice on depots for yard trimmings, green waste, and agricultural debris hauling. The Hotline will provide a list of private companies that can be contacted for detailed information on accepted waste and associated pricing.

Lower Mainland: 604-RECYCLE

Facilities Accepting Agricultural Vegetative Waste

Note: This information is valid as of Spring 2023. Facilities listed are not endorsed by Metro Vancouver. More current information can be found by searching under "Green Waste" through Metro Vancouver Recycles

Table 2. Facilities that may accept agricultural vegetative waste material in Metro Vancouver and surrounding areas.

Company Location	Accepted Materials	Cost per Tonne*	Notes
Ecowaste City of Richmond	Tree and shrub trimmings, plants, grass clippings, trees and stumps	Low	
Great West Disposal (GWD) City Surrey	Yard trimmings and brush.	Medium	Waste can be dropped off or removed through a bin service (8 – 30 m^3 bins)
Green For Life (GFL) Various locations	Leaves, plants, branches, food waste	Variable	Accepted items may vary by area.
Meadows Landscape Recycling Centre City of Pitt Meadows	Leaves, moss, vines, sawdust, grass and garden clippings, branches, roots, heavy vines, small trees	Low	Self-serve disposal yard
Net Zero Waste City of Abbotsford	Yard trimmings, branches and stumps, agricultural waste	High	Rocks and soil not accepted. Cost of disposal varies depending on waste type
Revolution Resource Recovery Various locations	Leaves, plants, branches, food waste	Variable	
Southernstar Enterprises City of Vancouver	Woody material, leaves, tree stumps and branches	Medium	Material must be able to go into a grinder
Vancouver Landfill City of Delta	Yard trimmings (grass, leaves, plants, clean unfinished wood and branches)	Low	Material intake decisions made on a case-by-case basis. Sod, soil, food waste is not accepted

Note: Low: $60-$80; Medium: $80-$100; High: $100-$120 as of December 2021

Equipment Supplier Contact Information

Note: This information is valid as of December 2021. Companies listed are not endorsed by Metro Vancouver.

Table 3. Equipment Supplier Contacts.

Contact	Location	Equipment
Bob's A to Z Rentals	Maple Ridge	Mower
Dynamic Rentals	Port Coquitlam	Chipper Grinder/Shredder
Fraser Valley Equipment	Surrey	Chipper
Kerrisdale Equipment	Vancouver, Richmond, Burnaby, Surrey	Chipper
Sunbelt Rentals	Vancouver, North Vancouver, Richmond, Burnaby, Surrey, Coquitlam, Port Coquitlam, Cloverdale	Chipper Mower
United Rentals	Vancouver, Surrey, Richmond	Chipper Mower
Westerra Equipment	Abbotsford	Chipper Grinder/Shredder
Williams Machinery	Surrey	Chipper Grinder/Shredder

There is one air curtain burner available for rent in the Lower Mainland (Table 4). The unit can be delivered for a fee of approximately $1,000 and rented for $2,500 per week, as of December 2021. The unit can process between 3 – 5 tonnes of vegetative debris per hour.

Table 4. Air Curtain Rental Contact.

Contact	Location	Equipment
Dave Lutton 604-613-8720	Abbotsford	Air Curtain Burner

Appendix II: Glossary

Agricultural vegetative debris

From the Code of Practice for Agricultural Environmental Management

a. includes, subject to paragraph (b),

(i) cuttings and prunings of 7 cm or less in diameter, and leaves, from trimming and pruning activities,

(ii) corn cobs, corn husks, straw, stalk, seed hulls and other crop residue from harvest activities, and

(iii) weeds, and

b. does not include woody residue or other by-products from wood processing.

Composting

An agricultural composting process is a process whereby agricultural by-products, woody residue, mortalities or processing waste, or a combination of any of them are mixed or layered and managed to decompose aerobically with either periodic turning or forced aeration. Compost is a product that is:

a. a stabilized earthly matter having the properties and structure of humus,

b. beneficial to plant growth when used as a soil amendment,

c. produced by composting, and

d. derived only from organic matter.

Open burning

The combustion of vegetative debris (such as branches, stalks, and other pieces of vegetative matter with or without leaves including woody residue) that is conducted outside a building and does not vent to a chimney or stack.

Soil amendments

Includes all materials managed to provide nutrients for crops (fertilizers) and/or all materials managed for their beneficial impact on the biological, physical or chemical nature of the soil (soil conditioners).

Woody residue

Woody residue means wood or a wood product that

a. is chipped or ground,

b. originates from

(i) wood processing,

(ii) the clearing of land, if the majority of greenery is removed and no soil is present, or

(iii) trimming or pruning activities,

c. has not been treated or coated with chemicals, including preservatives, glues, paints, varnishes, oils or finishing materials,

d. does not contain a foreign substance harmful to humans, animals or plants when combusted,

e. has not been exposed to salt water, and

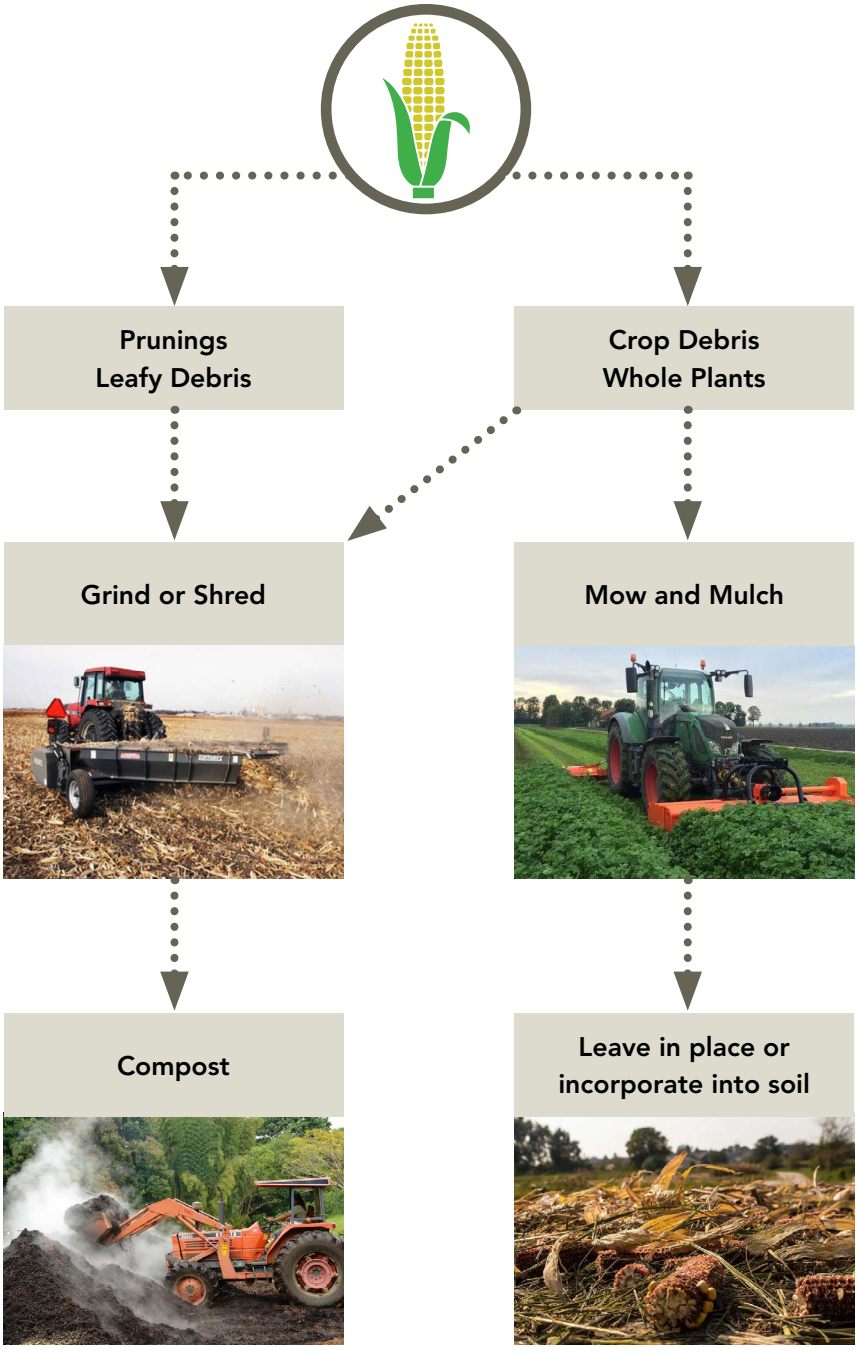
f. has not been used for or recovered from construction or demolition activities.

Vegetative debris

Branches and other pieces of vegetative matter targeted for disposal with or without leaves and plant stalks including woody residue. It does not include salt-laden wood.

Appendix III: One-Page Guides

Options for Field Vegetables and Forage Crop Management



Best Management Practices

Grinding or Shredding: Grinding is best for larger plant materials, stumps, and root balls that may contain soil, and can include wet and green materials. Shredding is best for green, fresh, or wet plant material. Shredding is less suitable for root balls and large woody materials.

Key Steps

- Have a plan for storing woody residue
- Remove as much soil and stones as possible
- Place debris in piles for ease of equipment loading

Mowing and Mulching: Best for processing plant debris in the field and leaving in place.

Key Steps

- Ensure there is a plan for storing, using, or transporting the processed debris
- Distribute material evenly to avoid clogging the flail mower (this could damage mower equipment and the tractor)
- Drive slowly over debris to ensure that large pieces are properly processed. Two or more passes over the materials may be needed to achieve the desired result
- Leave material in the field or incorporated into the soil

Note: Equipment can be purchased, rented, or a private contractor can be hired to carry out the work. You should ask contractors the hourly capacity for processing the materials before selecting the best option.

Scan this QR code for contacts to companies in the Lower Mainland:

Beneficial Uses

Composting: Composting vegetative waste creates a soil amendment that can be reused on the farm. Compost benefits soil by:

- Increasing organic matter content
- Improving nutrient retention and soil structure
- Suppressing plant diseases within soil

Determine the type of on-farm composting system that best meets the needs of your farm operation as directed in the On-Farm Composting Guide.

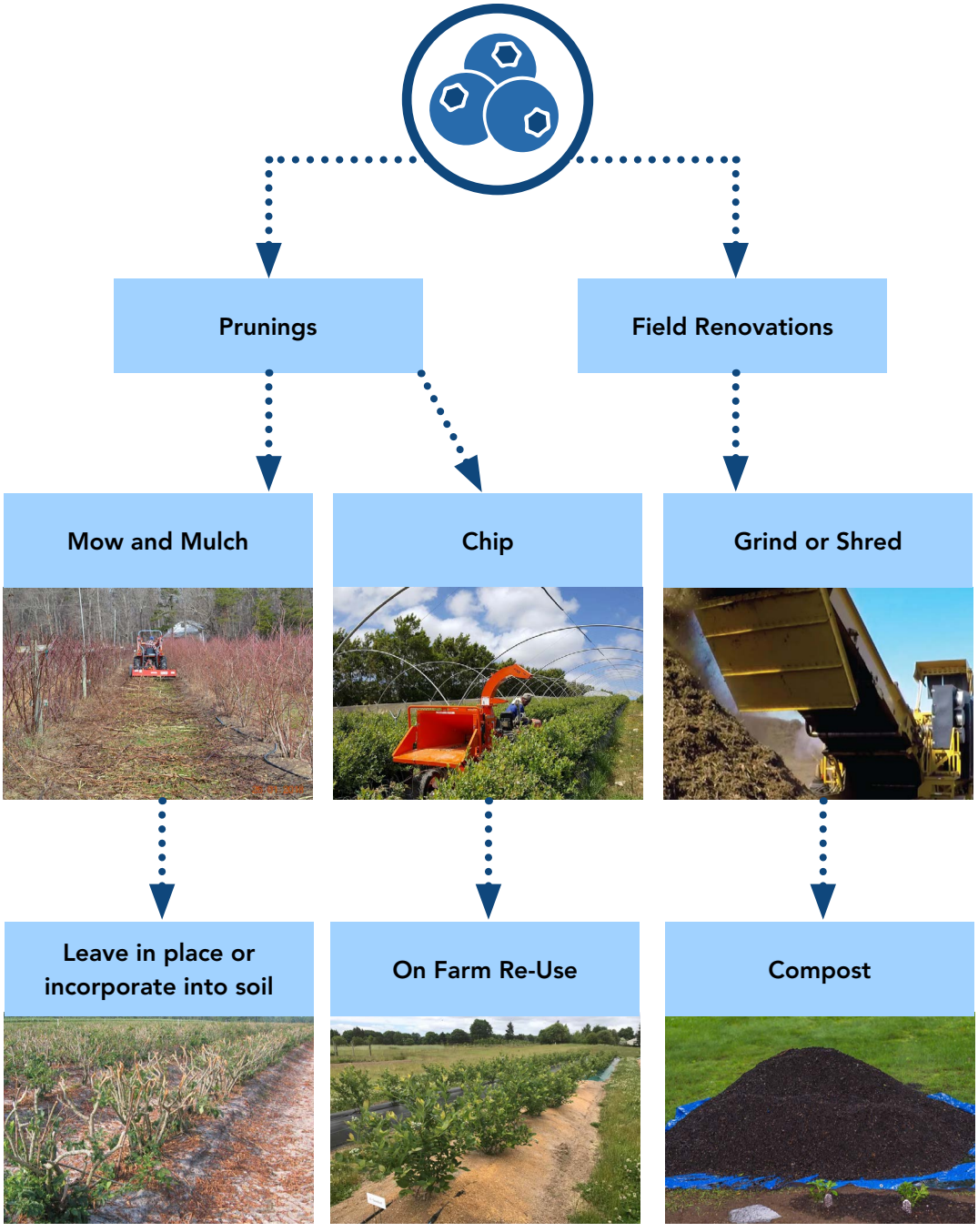
Leaving in Place or Incorporating into Soil: Leaving crop debris on the surface of the soil or incorporating it into the top layer of the soil can achieve many benefits such as:

- Adding a protective layer to the soil
- Reducing weed growth
- Moderating soil temperature
- Reducing evaporation
- Improving moisture retention

Refer to the full **Alternatives to Open Burning: Best Practices Guide** on Metro Vancouver's website for more information about:

- Equipment rentals and private contractors
- Off-farm disposal options for managing vegetative waste
- Best methods to dispose of invasive species, noxious weeds and diseased vegetation
- Regulations and best practices related to open burning

Options for Blueberry Crop Management



Best Management Practices

Chipping: Best for small volumes of dry debris.

Grinding or Shredding: Grinding is best for larger plant materials, and root balls that may contain soil, and can include wet and green materials. Shredding is best for green, fresh, or wet plant material. Shredding is less suitable for root balls and large woody materials.

Key Steps

- Ensure there is a plan for storing woody residue after processing
- Allow space for equipment to access and manoeuvre around the material
- Remove as much soil and stones as possible
- Place debris in piles for ease of equipment loading

Mowing and Mulching: Best for processing plant debris in the field and leaving in place.

Key Steps

- Ensure there is a plan for storing, using, or transporting the processed debris
- Distribute material evenly to avoid clogging the flail mower (this could damage mower equipment and the tractor)
- Drive slowly over debris to ensure that large pieces are properly processed. Two or more passes over the materials may be needed to achieve the desired result
- Leave material in the field or incorporated into the soil

Note: Equipment can be purchased, rented, or a private contractor can be hired to carry out the work. You should ask contractors the hourly capacity for processing the materials before selecting the best option.

Scan this QR code for contacts to companies in the Lower Mainland:

Beneficial Uses

Woody residue can be re-used as:

- Plant mulch or horticultural bedding
- Soil conditioner or ground cover
- Component of growing media for horticulture
- Animal/livestock bedding
- Lining an access way on farmland
- Fuel for wood-fired boilers (subject to Metro Vancouver's *Agricultural Boilers Emission Regulation* or permits)
- An input for composting

Composting: Composting vegetative waste creates a soil amendment that can be reused on the farm. Compost benefits soil by:

- Increasing organic matter content
- Improving nutrient retention and soil structure
- Suppressing plant diseases within soil

Determine the type of on-farm composting system that best meets the needs of your farm operation as directed in the On-Farm Composting Guide.

Mulching: Leaving crop debris on the soil or incorporating it into the top layer of the soil can:

- Add a protective layer to the soil
- Reduce weed growth
- Moderate soil temperature
- Reduce evaporation
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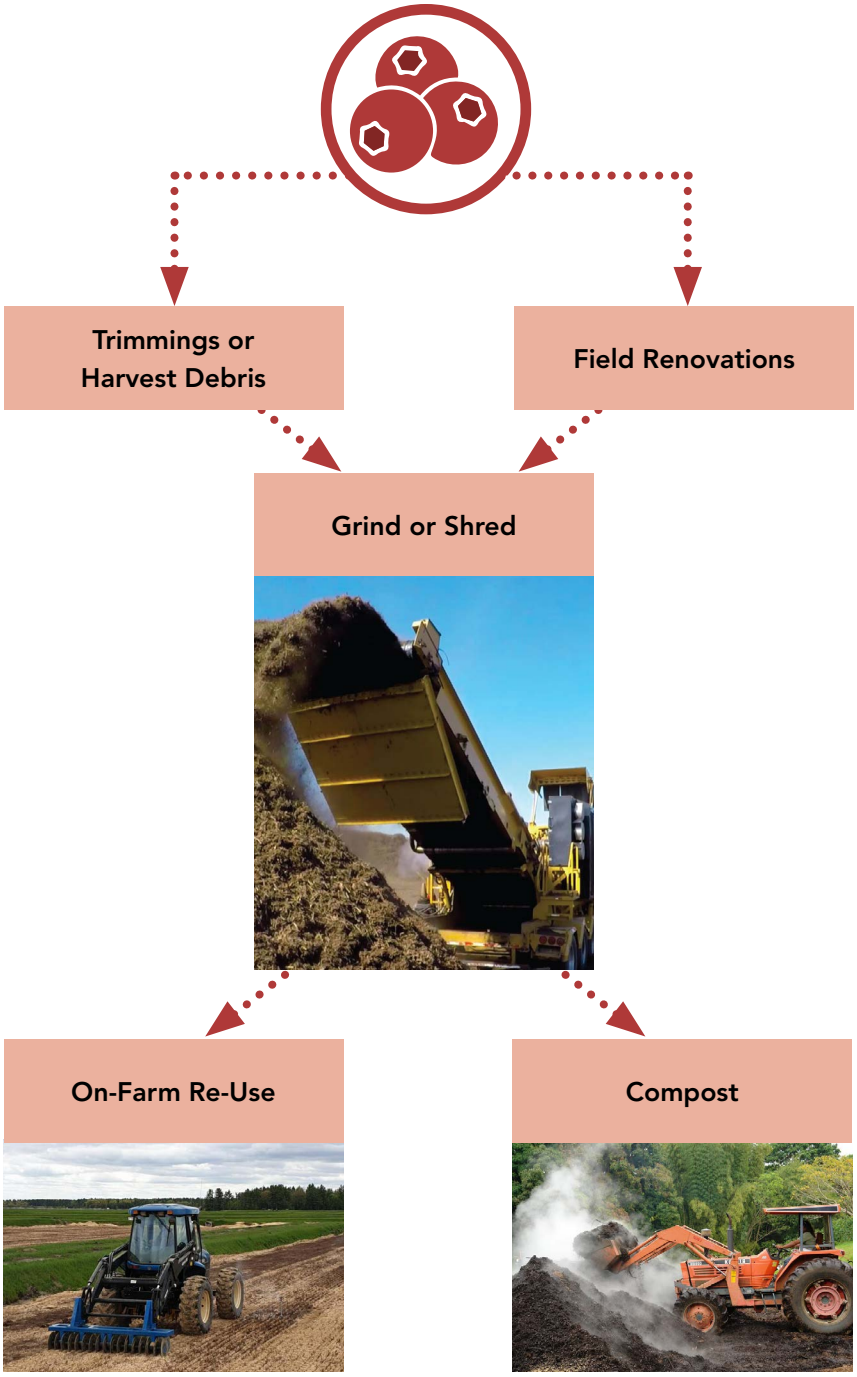
- Best methods to dispose of invasive species, noxious weeds
- Regulations and best practices related to open burning

Options for Cranberry Crop Management



Best Management Practices

Grinding or Shredding: Grinding is best for larger plant materials, and root balls that may contain soil, and can include wet and green materials. Shredding is best for green, fresh, or wet plant material. Shredding is less suitable for root balls and large woody materials.

Key Steps

- Ensure there is a plan for storing woody residue after processing
- Remove as much soil and stones as possible
- Place debris in piles for ease of equipment loading

Mowing and Mulching: Best for processing plant debris in the field and leaving in place.

Note: Equipment can be purchased, rented, or a private contractor can be hired to carry out the work. You should ask contractors the hourly capacity for processing the materials before selecting the best option.

Scan this QR code for contacts to companies in the Lower Mainland:

Cost-Benefit Analysis Example

A contractor's estimated fees:

1. Collecting a bin of vegetative debris and hauling it off-farm: $1,000 per 30 m^3 bin
2. On-farm grinding: $5,000 per day

Therefore, if the total vegetative material exceeds 150 m^3 (5 bins), it is more economical to process the material on site and re-use it on the farm.

Beneficial Uses

Woody residue can be re-used as:

- Plant mulch or horticultural bedding
- Soil conditioner or ground cover
- Component of growing media for horticulture
- Animal/livestock bedding
- Lining an access way on farmland
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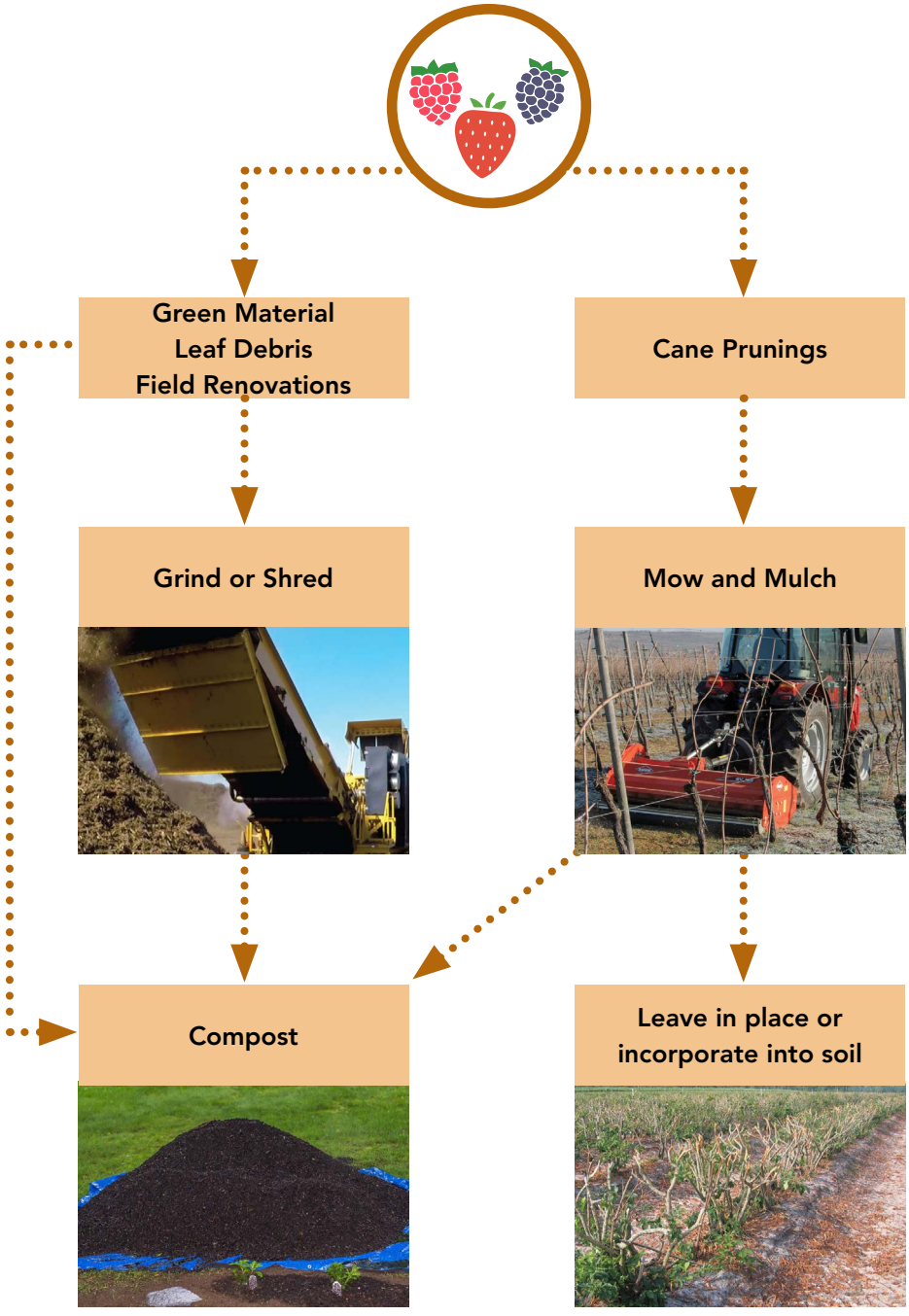
Options for Raspberry, Strawberry, and Blackberry Crops Management



Options for Raspberry, Strawberry and Blackberry Crop Management

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Key Steps

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Mowing and Mulching: Best for processing plant debris in the field and leaving in place.

Key Steps

- Ensure there is a plan for storing, using, or transporting the processed debris
- Distribute material evenly to avoid clogging the flail mower (this could damage mower equipment and the tractor)
- Drive slowly over debris to ensure that large pieces are properly processed. Two or more passes over the materials may be needed to achieve the desired result
- Leave material in the field or incorporated into the soil

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- Best methods to dispose of invasive species, noxious weeds
- Regulations and best practices related to open burning

Options for Greenhouse Vine Crop Management

Whole Plants (including soil media)
Trimming
Prunings

Grind or Shred

Compost

Best Management Practices

Grinding or Shredding: Grinding is best for larger plant materials, stumps, and root balls that may contain soil, and can include wet and green materials. Shredding is best for green, fresh, or wet plant material. Shredding is less suitable for root balls and large woody materials.

Key Steps

- Ensure there is a plan for storing woody residue after processing
- Remove as much soil and stones as possible
- Place debris in piles for ease of equipment loading

Case Study: Preparing Vegetative Waste for Off-Farm Composting

A Delta greenhouse operation growing vine crops has switched to using biodegradable twine. This allows the farm operator to shred plant material on-site (including twine) and then haul the material to an off-site location for composting.

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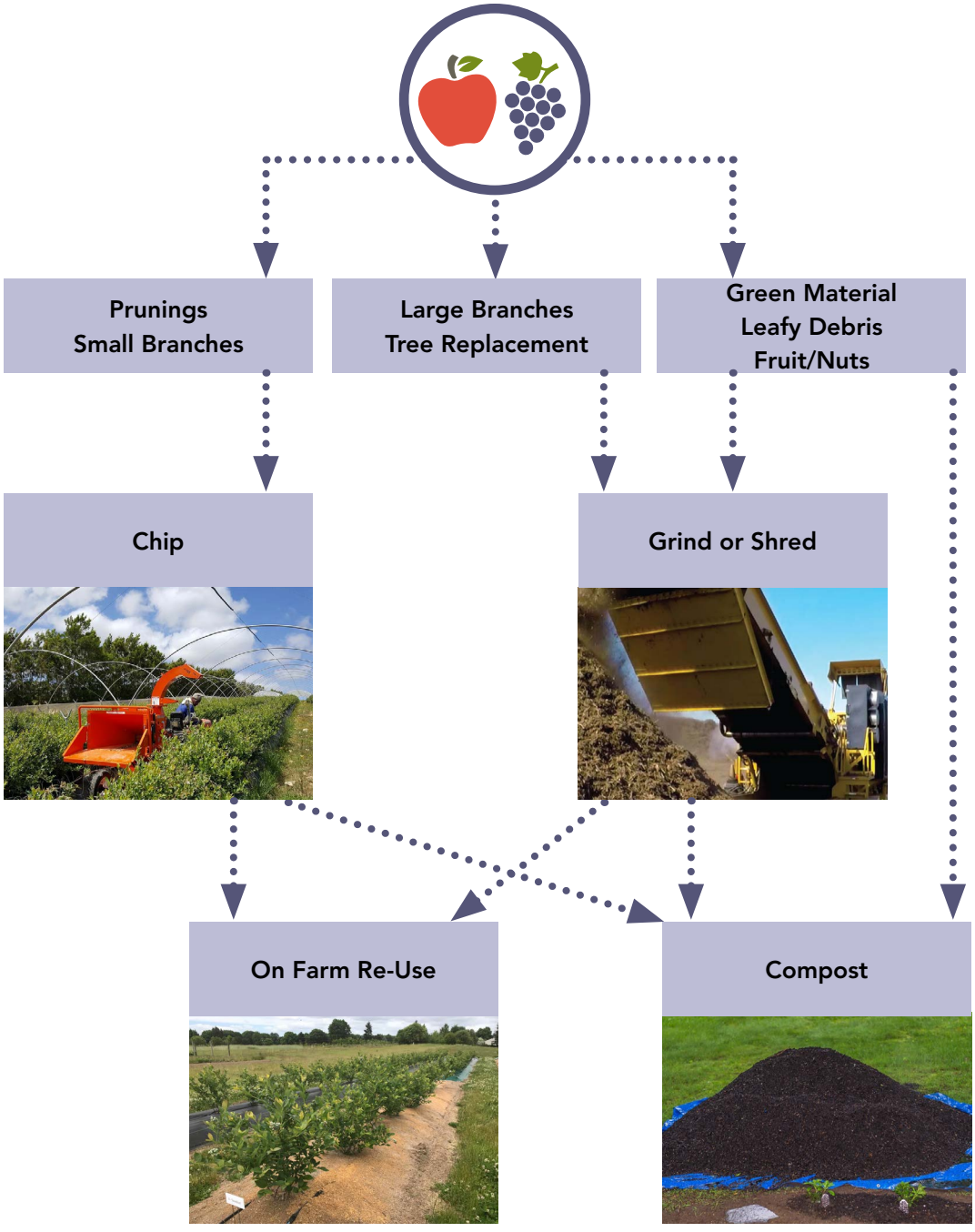
Options for Orchard and Vineyard Management



Best Management Practices

Chipping: Best for small volumes of dry debris.

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Key Steps

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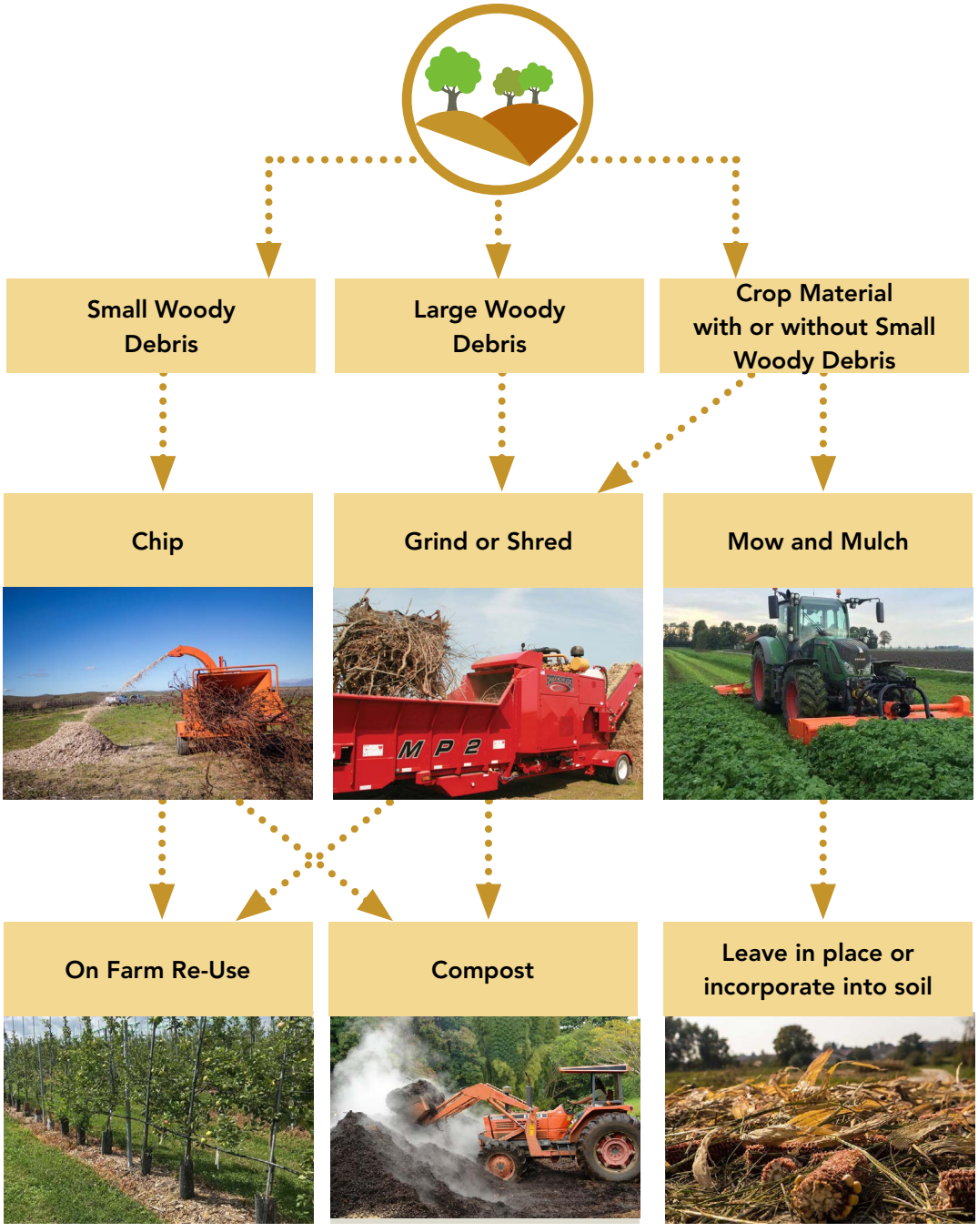
Options for Crop Renovation or Turn-Over



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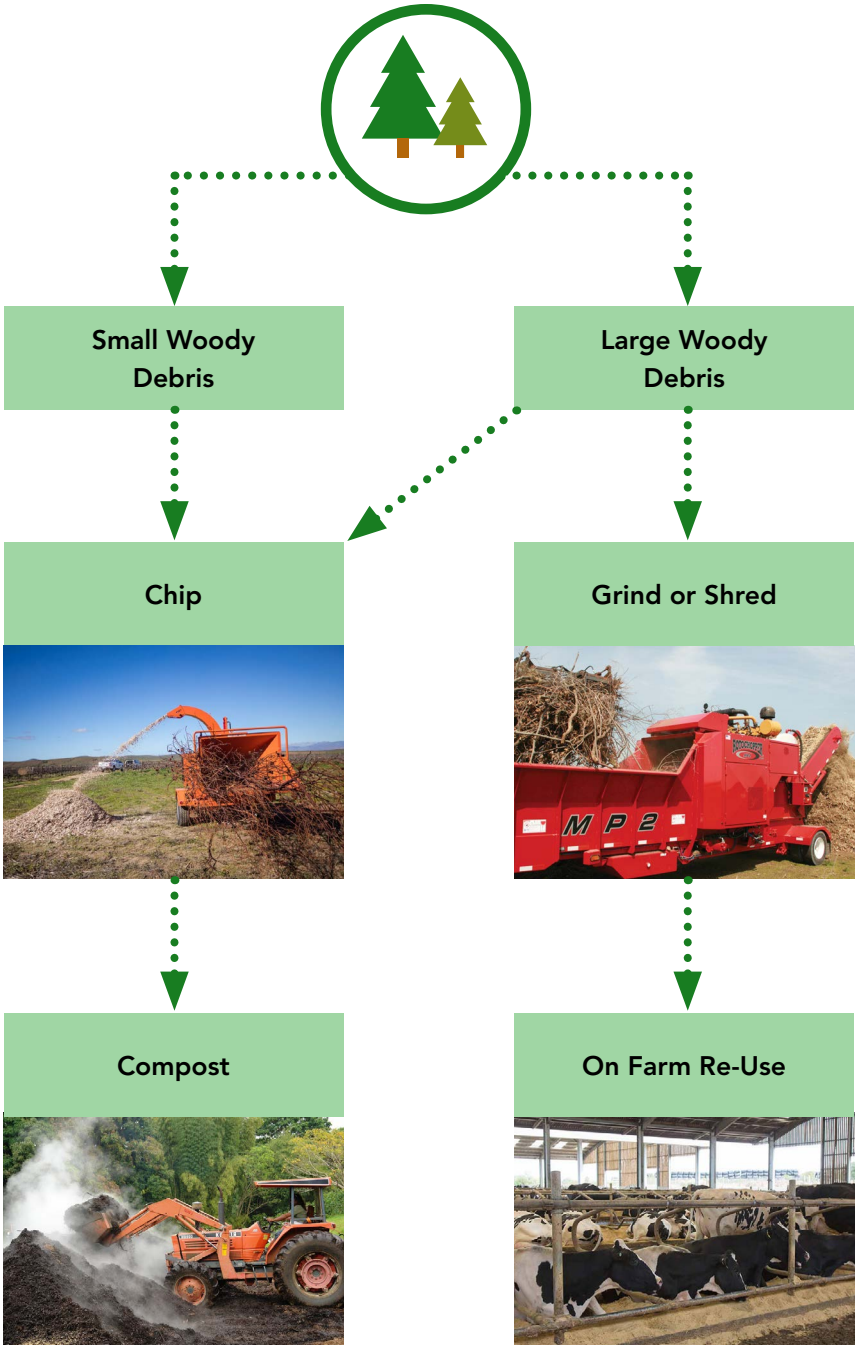
Options for Tree Removal or Brush Clearing



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