Viticulture Pilot Addendum to the Canada-Ontario Environmental Farm Plan (EFP) Program

Developed for Ontario’s Viticulture Sector as a component of Sustainable Winemaking Ontario: An Environmental Charter for the Wine Industry

A partnership between the Wine Council of Ontario, Grape Growers of Ontario, Ontario Farm Environmental Coalition, Agriculture and Agri-Food Canada, and the Ontario Ministry of Agriculture, Food and Rural Affairs
Background and context
This Viticulture Pilot Addendum is based on the draft document: Sustainable Winemaking Ontario - Environmental Best Practice for Wineries and Vineyards, one of the elements of the program Sustainable Winemaking Ontario: An Environmental Charter for the Wine Industry. This draft document was the subject of considerable review, including pilots and workshops. As a result, questions for vineyards, wineries and hospitality were separated.

The consistent comment made in pilots, workshops and some stakeholder meetings for vineyards was that there was some duplication with vineyard material and the Canada-Ontario Environmental Farm Plan. Vineyard questions are now found in this Viticulture Pilot Addendum for the Canada-Ontario Environmental Farm Plan Program, Third Edition Workbook.

The viticulture questions included in the piloted version were reviewed by a working group consisting of: Hugh Fraser, Neil Carter and Donna Speranzini, all of the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA); Mark Neufeld, representing the Grape Growers of Ontario; Gerry Walker of AgriCorp and Narelle Martin, for the Wine Council of Ontario. The input of Wendy McFadden-Smith and Leslie Huffman is also appreciated. The questions have been redrafted to be more consistent with the format of the Environmental Farm Plan.

The Wine Council of Ontario is very pleased the viticulture aspect of Sustainable Winemaking Ontario is able to be delivered as part of the Canada-Ontario Environmental Farm Plan and thanks all partners for their assistance in making this possible.

Relationship with Other Documents
This document is one of a series developed since October 2004 as part of Sustainable Winemaking Ontario. Related documents developed as part of the first phase of this project include:

Sustainable Winemaking Ontario: An Environmental Charter for the Wine Industry
- Eco-Winegrowing 101
- Sustainable Winemaking Ontario: Environmental Best Practice for Wineries
- Sustainable Winemaking Ontario - Viticulture Pilot Addendum to the Canada-Ontario Environmental Farm Plan
- Sustainable Winemaking Ontario- Environmental Best Practice for Winery Hospitality Services
- Sustainable Winemaking Ontario - A Newcomer’s Primer: the Environment and the Wine Industry in Ontario

Of these documents, Sustainable Winemaking Ontario - Environmental Best Practice for Wineries and Sustainable Winemaking Ontario-Environmental Best Practice for Winery Hospitality Services have also been developed as an interactive spreadsheet, allowing businesses to instantly receive feedback on their scoring and progress over time.

One of the priorities identified through discussions with the industry was to increase energy efficiencies for wineries. Research was undertaken and workshops were presented to the industry. Two publicly available documents on energy efficiency have been produced:


- Energy Best Practice for Wineries, Narelle Martin for the Wine Council of Ontario.

In addition, Niagara College is developing training programs for current industry members, as well as including more emphasis on environmental requirements and expectations in the curriculum for new industry members.

Members of the wine industry in Ontario who require all documents to review their operations should contact the Wine Council of Ontario. Copies of most documents are now available in a disc through the Wine Council of Ontario.

This document was compiled by:
- Donna Speranzini, Nutrient Management Planning Specialist, OMAFRA
- Hugh Fraser, Agriculture Engineer, OMAFRA
- Neil Carter, Tender Fruit and Grape IPM Specialist, OMAFRA

The technical content of this document was completed January 31, 2007.

This document has been reviewed by:
- Ken Slingerland, Tender Fruit and Grape Specialist, OMAFRA
- Narelle Martin, Two Hemispheres Environmental Consulting Inc. for the Wine Council of Ontario
- Mark Neufeld, Grape Growers of Ontario and EFP Program Representative for Niagara, OSCIA
- Anne Verhallen, Soil Management Specialist, OMAFRA
- Leslie Huffman, Weed Management Specialist, OMAFRA
- Wendy McFadden-Smith, McSmith Consulting, Vineland
- Kevin Kez, KCMS Applied Research and Consulting
- Gerry Walker, AgriCorp
- H.J. Smith, OMAFRA
- Cindy Bradley-MacMillan, OMAFRA

This Pilot Viticulture Addendum will be provided concurrently with the Canada-Ontario Environmental Farm Plan Program Workbook at EFP workshops delivered by the Ontario Soil and Crop Improvement Association. Grape grower participants in the program will complete the relevant sections in the Canada-Ontario Environmental Farm Plan Program Workbook and all of the associated Addendum questions, pertaining to their operation. The completion of both documents will ensure that all questions that may pertain to a grape growing operation from the Canada-Ontario Environmental Farm Plan Program Workbook are completed. If a grape growing operation also has livestock and/or some field cropping, then the appropriate sections of the Canada-Ontario Environmental Farm Plan Program Workbook also need to be completed.

Funding for the Canada-Ontario Environmental Farm Plan is provided by Agriculture and Agri-Food Canada and the Ontario Ministry of Agriculture, Food and Rural Affairs under the Agricultural Policy Framework (APF). The APF is an agreement among federal, provincial and territorial governments to make Canada's agricultural sector a world leader in environmentally sustainable production. Agricultural support for the program is led by the Ontario Farm Environment Coalition.
### Viticulture Worksheet 1: Farm Waste and Material Handling

(Pilot Addendum to EFP Worksheet #6)

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| 1. Waste reduction for farm and office (glass, paper, cardboard, plastics) | All of the following:  
- The amount of waste generated is measured  
- Targets for waste reduction are set and achieved  
- Staff are aware of the company/farm's expectations to reduce the amount of waste produced  
- Staff are encouraged to identify ways to reduce, reuse and recycle waste, wherever possible  
- Signage to reduce, reuse and recycle  
- Suppliers are encouraged to reduce waste (packaging, or reusable and recycled products) | Any 4 items in BEST column | Any 2 or 3 items in BEST column | Any 1 or no items in BEST column | A | B | C | D | E |
| 2. Hazardous Wastes (solvents, acids, varnishes, oils, old compressed gas cylinders, tires, batteries) | Materials are disposed of in a timely fashion at municipally designated collection centres and if present in large amounts are reported to MOE | Waste material is stored on farm | | A | B | C | D | E |
| 3. WHIMIS | All of the following:  
- Staff have been trained  
- All chemicals have appropriate labels and hazard warnings  
- Chemical data sheets are available | Any 2 items in BEST column | Any 1 item in BEST column | No items in BEST column | A | B | C | D | E |
| 4. Environmentally friendly purchases | All of the following:  
- Non-aerosol vs aerosol dispensers  
- Water based paints vs oil based  
- Rechargeable vs non-rechargeable batteries  
- Low toxicity cleaning products  
- Recyclable picking containers | Any 2 items in BEST column | Any 1 item in BEST column | No items in BEST column | A | B | C | D | E |
| 5. Emergency management and planning | All of the following:  
- You have an established Farm Emergency Plan  
- The phone numbers of emergency organizations are posted  
- Staff are trained in spill prevention and clean up procedures  
- Clean up materials are available (e.g. kitty litter, temporary berm, etc.) | Any 2 items in BEST column | Any 1 item in BEST column | No items in BEST column | A | B | C | D | E |
### Viticulture Worksheet 2: Relations with Neighbours

(Pilot Addendum to EFP Worksheet #12)

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#### Identifying Number of Potential Point Source Nuisances Within 1,000 Feet of One, or More, Neighbouring Homes

1. **Odour point sources**
   - None
   - Any 1 or 2 items from column 1
   - Any 3 or more of following 7 items:
     - Permanent storages for manure, pomace or other organic materials
     - Livestock facility
     - Compost piles
     - Temporary field storages for solid manure or other organics (pomace)
     - Livestock pasturing near residences (e.g., horses)
     - Manure or other organic material field application
     - Pesticide applications

2. **Noise (or vibration) point sources**
   - None
   - Any 1 or 2 items from column 1
   - Any 3 or more of following 7 items:
     - Cropping equipment
     - Night time grape harvest
     - Bird scaring devices
     - Wind machines for crop protection
     - Wind turbines for electrical generation
     - Livestock ventilation fans
     - Engine-driven irrigation pumps

3. **Fly insect point sources**
   - None
   - Any 1 item from column 1
   - Any 2 or more of following 6 items:
     - Permanent storages for manure or other organic materials
     - Livestock facility
     - Compost piles
     - Temporary field storages for solid manure or other organic materials
     - Livestock pasturing near residences (e.g., horses)
     - Manure or other organic material field application

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Sustainable Winemaking Ontario: Viticulture Addendum to the Canada-Ontario Environmental Farm Plan Program, Third Edition Workbook

Worksheet 2 - Page 1
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| 4. Smoke point sources | None | Any 1 item from column 1 | Any 2 or more of following 3 items:  
- Burning prunings  
- Burning farm wastes  
- Burning organic materials for heating shops, greenhouses, etc. | Sites | A | B | C | D | E |
| 5. Light point sources (between period of 30 minutes after sunset and 30 minutes before sunrise when it is considered nighttime) | None | Any 1 item from column 1 | Any 2 or more of following 4 items:  
- Lights in greenhouses  
- Grape harvester and equipment lights during fall grape harvest  
- Grape harvester and equipment lights during ice-wine harvest  
- Yard security lighting | | | | | | |
| 6. Dust point sources | None | Any 1 item from column 1 | Any 2 or more of following 4 items:  
- Traffic on unpaved roads  
- Soil erosion by wind from laneways and bare fields  
- Livestock ventilation fans  
- Field tillage | | | | | | |
| 7. Keeping neighbours informed about what you do on your farm | All of the following:  
- Identify person, or team, responsible for providing information to neighbours  
- Talk to neighbours through a variety of methods: periodic visits, phone calls, community parties, after hours number to call  
- Inform neighbours when nuisances are about to begin, such as noise (e.g. cannons, wind machines, or harvesting) or odours (e.g. manure spreading or spraying) | Any 2 items in BEST column | Any 1 item in BEST column | None | Sites | A | B | C | D | E |
### MINIMIZING NOISE COMPLAINTS BY NEIGHBOURS

8. **Propane, fixed bird-scaring cannons (bird-bangers) to protect grapes from scavenging**

Any 11 or more of the following 15 items:
- Identify person or team responsible for providing information about cannons to neighbours living within 800 ft of them
- A combination of bird deterrent methods are used, not just cannons
- Cannon are first turned on at veraison, then until harvest
- A contact and phone number is given to neighbours within 800 ft to call if a cannon is operating incorrectly, i.e. at night
- No more than one cannon is used per 5 acres of vineyard
- Cannons are only used during daylight hours, between 30 minutes before local sunrise and 30 minutes after local sunset, with sunrise and sunset times you’d read in the newspaper, or hear on the radio
- Timers and sensors are adjusted at least once per week, as sunrise and sunset both change daily about two minutes
- Cannons are moved to other locations at least once per week, so birds don’t get used to them being in one place only
- Cannons are never fired more often than between 2 to 4 minutes between firing sequences, less often, if possible (Note: A triple-firing cannon sequence is three firings in the space of about 10 seconds)
- Cannon tripods are adjusted to be level so they fire uniformly in all directions over time, and not more often in one direction
- Cannons are never directed down a grape row towards a neighbour’s house as the row canopy channels the sound
- Cannon are kept at least 400 ft from a neighbour’s house, provided they are properly balanced to fire in all directions evenly, further if this is not the case
- Alkaline batteries are used to ensure continuous operation during cold weather operations (ice-wine)

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| 9. Wind machines to protect grapes from cold injury | Any 8 or more of the following 12 items:  
- Identify person, or team, responsible for providing information about wind machine need and operation plans to neighbours that could be impacted by noise  
- While wind machines are placed in the optimum location for protecting the grapes, the location of neighbours' houses is taken into account as well  
- Wind machines are located according to the best available information on the area they help protect, topography of the land, and the natural drift of the land in the area  
- More cold-sensitive varieties are planted in locations further from neighbours' houses, so that wind machines are also further from the neighbours, if possible  
- Grape variety selection, planting location, and seasonal management techniques are all practiced in order to improve winter hardiness and thus minimize the time needed for wind machine use  
- Air temperature sensors are located near vine level to see if cold damaging temperatures are present and at least 15 m above the vineyard to see if a strong temperature inversion is present to tell if using the wind machine would assist in warming up the vineyard  
- Wind speeds are monitored closely to see if they are greater than about 10 km/h which would eliminate the effectiveness of a temperature inversion, possibly cause wind machine damage, and cause a 'chopping' noise by the wind machine  
- A contact number is made available to neighbours, either directly or posted at the farm, to voice any complaints that a wind machine may be operating, by mistake or at times when temperature conditions would obviously mean it should not be operating  
- Automatic temperature sensors, that activate wind machines, are calibrated to ensure operation only when necessary and readjusted according to best available information on plant hardiness  
- Automatic shutdown mechanism for high wind conditions  
- Safety regulations are followed for fuel systems and storage  
- Attend workshops on wind machine BMPs | Any 5 to 7 items in BEST column | Any 1 to 4 items in BEST column | | | | | | |
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<td><strong>10. Dealing with neighbours</strong></td>
<td>All of following:</td>
<td>Any 1 or 2 items in BEST column</td>
<td>None</td>
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<td>• Identify person, or team, responsible for responding, logging, and following up on complaints</td>
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<td>• A written procedure is in place for staff to follow in the case of complaints</td>
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<td></td>
<td>• Staff are made aware of and trained in procedures for them to follow in the case of complaints</td>
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<td>COMMUNITY ACTION</td>
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<td><strong>11. Dealing with broader community issues</strong></td>
<td>All of following:</td>
<td>Any 1 or 2 items in BEST column</td>
<td>None</td>
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<td></td>
<td>• Participate in local Municipal planning issues such as watershed management plans through local Conservation Authorities, or commenting on new local By-Laws</td>
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<td>• Participate in local agricultural research issues such as on-farm applied research trials, trying new varieties, or water conservation trials with local Conservation Authorities</td>
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<td></td>
<td>• Participate in local development issues such as monitoring proposals for development and discussing with developers on any proposed development near your property</td>
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# Viticulture Worksheet 3: Water Efficiency

(Pilot Addendum to EFP Worksheet #13)

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<tbody>
<tr>
<td><strong>1. Water consumption</strong></td>
<td>Have calculated water consumption per tonne of grapes produced including natural rainfall</td>
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<td>Water use is unknown and not considered</td>
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<td><strong>2. Water conservation</strong></td>
<td>Targets have been established for reduction of water use per tonne of production</td>
<td></td>
<td>No targets have been established for reduction of water use per tonne of production</td>
<td></td>
<td></td>
<td>Water use is unknown and not considered</td>
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<td></td>
<td>A team or person has been assigned to identify ways to reduce water use</td>
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<td><strong>3. Water supplied for drinking water for farm workers</strong></td>
<td>Have investigated potential requirements for ensuring safe supply of drinking water for farm workers where drinking water comes from a source other than municipal water (e.g. well or surface water, etc.)</td>
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<td>Not aware that there are requirements for drinking water supply</td>
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<td><strong>4. Irrigation system design</strong></td>
<td>The irrigation system was designed and sized to match the water requirements of your operation (e.g. water storage volumes, pond sizing, run lengths and pressure, etc.)</td>
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<td>Water requirements unknown</td>
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</table>
| **5. Storm water management** | Any 2 of the following 3 items:  
• You have mapped and know the outlets for all storm water drains  
• Drains/inlets are protected from possible contamination (e.g. fuel, pesticides, etc.)  
• You are recycling or recovering storm water (e.g. in ponds, toilets, garden etc.) | Any 1 item in BEST column | | | | None |
<p>| <strong>6. Irrigation water quality and food safety risks</strong> | Irrigation source water is assessed for potential upstream risks and irrigation water is tested for all quality parameters (including pH, bacteria and salts) and treatment systems are in place for when quality is below acceptable standards and records are kept of both sampling and treatment details | | | | | |
| | Irrigation source water is assessed for potential upstream risks and irrigation water is tested for all quality parameters (including pH, bacteria and salts) | | | | | |
| | Irrigation source water is never tested and potential upstream risks are not considered | | | | | |</p>
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| 7. Fertigation | Any 5 of the following 6 items:  
- Installed anti-backflow devices to prevent source water contamination  
- Source water pH is known  
- Injection equipment is calibrated  
- Knowledge of time to prime system with fertilizer is known  
- Rates are adjusted throughout the season to match crop demand  
- Lines are completely flushed with clear water | Any 4 items in BEST column | Any 3 items in BEST column | Any 2 or less items in BEST column | | | | | |
**Viticulture Worksheet 4: Energy Efficiency**

(Pilot Addendum to EFP Worksheet #14)

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| 1. Planning & monitoring | Any 4 of the following 6 items:  
  - Identify a person, or team, responsible for energy management  
  - Advise staff to use energy saving practices  
  - Monitor & record energy use for each grape production area (i.e. fuel)  
  - Compare year to year energy consumption per tonne production  
  - Keep up to date on energy efficiency technologies  
  - Heating, Ventilation and Air Conditioning (HVAC), building, lighting & machinery systems on a regular cleaning/maintenance schedule to improve energy efficiency | Any 3 items in BEST column | Any 2 items in BEST column | Any 1 item in BEST column | A | B | C | D | E |
| 2. Economics | All of the following 4 items:  
  - Capital budget plan is in place to increase energy efficiency  
  - Keep aware of changes occurring in Ontario energy market  
  - Understand energy rates and negotiate best prices possible  
  - Identify opportunities to switch to off-peak power to reduce costs | Any 3 items in BEST column | Any 2 items in BEST column | Any 1 item in BEST column | A | B | C | D | E |
| 3. Lighting type, where used more than 5 hours per day | T-8 fluorescent lighting with high efficiency ballast  
  - OR high intensity discharge with electronic dimming  
  - OR high pressure sodium lights or metal halide (H.L.D) | T-12 fluorescent lighting with standard ballast | Compact fluorescent lights | All incandescent lights | A | B | C | D | E |
| 4. Lighting type, where used less than 5 hours per day | All of the following:  
  - Compact fluorescents with dimmers  
  - Timer controls  
  - Motion sensors  
  - Task lighting  
  - Unnecessary lights are identified and removed | Any 3 items in BEST column | Any 2 items in BEST column | All incandescent lights | A | B | C | D | E |
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<td>5. Use of fuels</td>
<td>Any 4 of following 7 items:</td>
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<td>• Tractor size matched to size of implements</td>
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<td>• Multiple operations done at same time, whenever possible</td>
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<td>• Practice ‘gear up &amp; throttle down’ driving</td>
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<td>• Tires inflated properly</td>
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<td>• Field work is planned ahead where possible to reduce tractor use</td>
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<td>• Timely maintenance of equipment</td>
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<td>• Minimum idling time</td>
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<td>6. Sustainable</td>
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<td>• Attend workshops or engage professionals to investigate sustainable</td>
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<td></td>
<td>'greener' power sources (e.g. wind power, passive solar hot water,</td>
<td></td>
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<tr>
<td></td>
<td>solar photovoltaics, hybrid vehicles, anaerobic digesters,</td>
<td></td>
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<tr>
<td></td>
<td>alternative fuel sources for machinery, etc.)</td>
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<tr>
<td></td>
<td>• Purchase green power when available through electricity grid</td>
<td></td>
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<tr>
<td></td>
<td>• Understand impact of greenhouse gas credits on operation</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

SUSTAINABLE WINEMAKING ONTARIO: VITICULTURE ADDENDUM TO THE CANADA-ONTARIO ENVIRONMENTAL FARM PLAN PROGRAM, THIRD EDITION WORKBOOK

WORKSHEET 4 - PAGE 2
## Viticulture Worksheet 5: Soil Management

*(Pilot Addendum to EFP Worksheet #15)*

<table>
<thead>
<tr>
<th>Rating</th>
<th>Best</th>
<th>Sites</th>
<th>Y R R A T I N G</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Land highly erodible by water</strong></td>
<td>Established and new vineyards have permanent year round ground cover between rows and no evidence of slumping, water erosion or water pollution OR measures taken to reduce soil movement off-site (e.g. permanent sod headlands, erosion control structures and grassed waterways)</td>
<td>Established and new vineyards have fall, winter and spring cover between rows and little evidence of bank slumping, water erosion or water pollution.</td>
<td>![ ] ![ ] ![ ] ![ ] ![ ]</td>
</tr>
<tr>
<td><strong>2. Land highly erodible by wind</strong></td>
<td>Established and new vineyards have permanent year round ground cover between rows Driveways maintained to avoid dust and no evidence of wind erosion on or off farm OR measures taken to reduce soil movement off-site (e.g. Permanent sod headlands, erosion control structures and grassed waterways)</td>
<td>Established and new vineyards have fall, winter and spring cover between rows Driveways maintained to avoid dust and little evidence of wind erosion on or off farm</td>
<td>![ ] ![ ] ![ ] ![ ] ![ ]</td>
</tr>
<tr>
<td></td>
<td>Established and new plantings have fall, winter and spring cover for every other row Minimal cultivation OR some evidence of bank slumping, water erosion or water pollution</td>
<td>Established and new plantings have fall, winter and spring cover for every other row Minimal cultivation OR seasonal evidence of damage by wind erosion on and off farm. (i.e. dust moves from laneways)</td>
<td>![ ] ![ ] ![ ] ![ ] ![ ]</td>
</tr>
<tr>
<td></td>
<td>There is no fall, winter or spring cover between rows Several cultivation passes Potential new planting sites have bare soil OR evidence of bank slumping, gullies, and rill erosion in many places OR sediment reaches watercourse directly</td>
<td>There is no fall, winter or spring cover between rows Several cultivation passes Potential new planting sites are bare soil OR evidence of bank slumping, gullies, and rill erosion in many places OR frequent evidence of dust, drifting soil, dark brown snow drifts and crop damage</td>
<td>![ ] ![ ] ![ ] ![ ] ![ ]</td>
</tr>
</tbody>
</table>

*Sustainable Winemaking Ontario: Viticulture Addendum to the Canada-Ontario Environmental Farm Plan Program, Third Edition Workbook*
### 3. Timely tillage and reduced traffic

<table>
<thead>
<tr>
<th>Rating</th>
<th>Best 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>No-till</td>
<td>Hilling is done when soils are sufficiently dry and no unnecessary traffic on wet soils</td>
</tr>
</tbody>
</table>

### 4. Deep tillage (sub-soiling)

<table>
<thead>
<tr>
<th>Rating</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any 4 of the following 5 items:</td>
<td></td>
</tr>
<tr>
<td>• Maintain optimum soil health to reduce development of deep soil compaction</td>
<td></td>
</tr>
<tr>
<td>• Depth and thickness of compaction layer is identified</td>
<td></td>
</tr>
<tr>
<td>• Depth of deep tillage is set to below the identified compaction depth</td>
<td></td>
</tr>
<tr>
<td>• Soil is dry to the depth of deep tillage operation</td>
<td></td>
</tr>
<tr>
<td>• Sub-soil and top-soil are not mixed through deep tillage action</td>
<td></td>
</tr>
</tbody>
</table>

### 5. Laser land levelling

<table>
<thead>
<tr>
<th>Rating</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any 6 of the following 9 items:</td>
<td></td>
</tr>
<tr>
<td>• Deal with a reputable contractor</td>
<td></td>
</tr>
<tr>
<td>• Ensure proper separation of top soil and sub-soil (i.e., recognize and identify variability across the field)</td>
<td></td>
</tr>
<tr>
<td>• Top soil should not be piled for extended periods of time to help maintain soil structure and reduce compaction (i.e., less than 1 week)</td>
<td></td>
</tr>
<tr>
<td>• All work should be done when soil is dry to avoid deep soil compaction and reduce loss of topsoil structure</td>
<td></td>
</tr>
<tr>
<td>• Equipment used (e.g., tire size, inflation pressure, tillage implement) should minimize compaction</td>
<td></td>
</tr>
<tr>
<td>• Ensure sufficient slope for proper water and air drainage</td>
<td></td>
</tr>
<tr>
<td>• Understand the impact of levelling on surface water flow to adjacent properties (creeks, wetlands)</td>
<td></td>
</tr>
<tr>
<td>• Surface water flow is directed to a protected outlet to prevent bank erosion</td>
<td></td>
</tr>
<tr>
<td>• Land levelling is followed with a green manure crop to help re-establish soil structure and internal drainage</td>
<td></td>
</tr>
</tbody>
</table>

### Sites

<table>
<thead>
<tr>
<th>Your Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
</tr>
<tr>
<td>Excessive surface cultivation regardless of soil moisture</td>
</tr>
<tr>
<td>Hilling is done on wet soils</td>
</tr>
<tr>
<td>Frequent cultivation and surface tillage</td>
</tr>
<tr>
<td>Hilling is done on wet soils and no unnecessary traffic on wet soils</td>
</tr>
<tr>
<td>Moderate or conservation tillage (no discs, some chisels and cultivators)</td>
</tr>
<tr>
<td>Hilling is done when soils are sufficiently dry and no unnecessary traffic on wet soils</td>
</tr>
<tr>
<td>Rating</td>
</tr>
<tr>
<td>--------</td>
</tr>
</tbody>
</table>
| 6. Strategies for improved soil organic matter | Any 5 of the following 6 items:  
- Maturity and/or compost and/or other organic matter sources such as straw are incorporated  
- No-till interrow management (except for manure incorporation)  
- Cover crops are used between rows  
- Field prunings and grass clippings are mulched and left in the field  
- Water and wind erosion prone areas are stabilized to prevent erosion  
- Incorporate green manure crops the year before vineyard establishment | Any 4 items in BEST column | Any 3 items in BEST column | Any 2 or less items in BEST column | F | G | H | I | J |
### Viticulture Worksheet 6: Nutrient Management

(Pilot Addendum to EFP Worksheets #8, #12, #16, and #17)

<table>
<thead>
<tr>
<th>Rating</th>
<th>Best 4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>Sites</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
</table>
| **1. Pre-plant year soil and nutrient management** | Any 5 of the following 7 items:  
- Soil tests are taken for pH, organic matter and nutrients  
- Low pH levels are corrected with lime  
- Potassium and phosphorus are adjusted to recommended levels  
- Soil organic matter is known  
- A green manure crop is grown  
- Manure or compost is applied at recommended rates  
- A cover crop is used to provide winter soil cover | Any 4 items in BEST column | Any 3 items in BEST column | Any 2 items or less in BEST column | | | | | | |
| **2. Soil pH** | Any 4 of the following 6 items:  
- Soil tests are performed to measure and identify pH problems every 3 years  
- Records are kept of soil test results and associated field maps  
- Soil pH corrections are made in the pre-plant year  
- Low pH is corrected to a pH of 6.0 on clay soils and 6.5 on sandy soils when the soil test for pH is below 5.1 on a clay and 5.6 on sandier soils  
- The determination of limestone rates are based upon the soils buffer capacity, the agricultural index of the limestone used and the intended incorporation depth.  
- Dolomite limestone is used on soils with less than 100 ppm magnesium | Any 3 items in BEST column | Any 2 items in BEST column | Soil pH is unknown and not monitored | | | | | | |
| **3. Tissue (petiole) analysis** | Any 3 of the following 5 items:  
- Samples are collected at the same plant growth stage every year, late August to early September  
- Samples are collected from the same vines every year  
- Records of analysis are kept and trends noted  
- Proper sampling techniques are followed - samples include at least 100g of tissue and are free of contamination from soil  
- Soil samples are taken in conjunction | Any 2 items in BEST column | Any 1 item in BEST column | No tissue (petiole) samples taken | | | | | |
<table>
<thead>
<tr>
<th>Rating</th>
<th>Best 4</th>
<th>3</th>
<th>2</th>
<th>1 Sites</th>
<th>YOUR RATING</th>
</tr>
</thead>
</table>
| 4. Amount of nutrients | Fertilizer rates are based on any 3 of the following 5 items:  
- Tissue analysis compared to standard ranges  
- Soil test compared to calibrated response curves  
- Previous years growth and performance  
- Micronutrients applied in response to deficiencies  
- Visual assessment and vine health | Any 2 items in BEST column | Any 1 item in BEST column | No items in BEST column | A | B | C | D | E |
| 5. Nutrient Management Planning | All of the following:  
- You are aware of the Nutrient Management Act, 2002  
- You know if you are impacted by regulations under the Nutrient Management Act, 2002  
- You document all nutrient applications both organic and inorganic (e.g. dates, rates, analysis, location, and weather)  
- You have identified the potential transport pathways for nutrients off your vineyard (e.g. surface water via tiles, groundwater via sandy soil, shallow aquifers, location and state of wells)  
- You apply nutrients based on crop demands  
- You have an emergency plan for nutrient spills | Any 5 items in BEST column | Any 3 or 4 items in BEST column | Any 2 items or less in BEST column | A | B | C | D | E |
| 6. Manure application rates and adjustment to amount of fertilizer used | Low rate of manure used per year  
Less than 22 tonnes/ha (10 tons/acre) solid cattle, sheep or horse  
Less than 5.6 tonnes/ha (2.5 tons/acre) solid poultry  
and a manure analysis is taken to determine application rates of nutrients  
and amount of fertilizer is reduced by the nutrient value of the manure added (N,P,K and micros)  
and manure application rates are calibrated/confirmed | Moderate rate of manure used per year  
22-44 tonnes/ha (10-20 tons/acre) solid cattle, sheep or horse  
5.6-11.2 tonnes/ha (2.5-5 tons/acre) solid poultry  
and amount of fertilizer is reduced by the nutrient value of the manure added (N,P,K and micros)  
and a manure analysis is taken to determine application rates of nutrients | High rate of manure used per year  
Greater than 44 tonnes/ha (20 tons/acre) solid cattle, sheep or horse  
Greater than 11 tonnes/ha (5 tons/acre) solid poultry  
and amount of fertilizer is reduced by the nutrient value of the manure added (N,P,K and micros) | Rate unknown OR nutrient value of manure is not considered when determining amount of fertilizer to use | A | B | C | D | E |
<table>
<thead>
<tr>
<th>Rating</th>
<th>Best 4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>Sites</th>
<th>Your Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Distance to surface water for manure application</td>
<td>Solid manure is spread more than 15 m (50 ft) from surface water, liquid manure more than 30 m (100 ft) OR manure is applied based on separation distances from surface water as identified in Table 2 below and there is a permanently vegetated buffer, greater than 3 m (10ft.) wide, running alongside surface water sources and if soil test levels for phosphorus are more than 30 ppm, the P-Index is used to determine required greater separation distances</td>
<td>Solid manure is spread 9 - 15 m (29 - 50 ft) from surface water, liquid manure 18 - 30 m (51-100 ft) OR manure is applied based on separation distances from surface water as identified in Table 2 and there is a permanently vegetated buffer at least 3 m (10ft.) running alongside surface water sources and if soil test levels for phosphorus are more than 30 ppm, the P-Index is used to determine required greater separation distances</td>
<td>Solid manure is spread 5 - 8 m (15 - 25 ft) from surface water, liquid manure 10 - 15 m (30 - 50 ft) OR manure is applied at less than the separation distances from surface water as in Table 2</td>
<td>Solid manure is spread less than 5 m (15 ft) from surface water, liquid manure less than 10 m (30 ft) OR soil test levels for phosphorus are more than 30 ppm and the P-Index is not calculated</td>
<td>A</td>
<td>B</td>
</tr>
</tbody>
</table>

| 8. Storage and application of solid manure, or other organic materials | Any 5 or more of the following 6 items:  
• Identify person, or team, responsible for providing information about storage and application plans to neighbours within 300 m (1000 ft)  
• Permanent storages (always in the same place and storing long periods) sited according to MDS II (Minimum Distance Separation) formula  
• No more than one application of materials per year, resulting in one odour event per year  
• Materials are spread and incorporated within 24 hours, weather permitting  
• Materials spread on cool, breezy weekdays  
• Materials are spread under optimum soil conditions | Any 3 to 4 items in BEST column | Any 2 or less items in BEST column | | | | | |
<table>
<thead>
<tr>
<th>Rating</th>
<th>Best 4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>Sites</th>
<th>Your Rating</th>
</tr>
</thead>
</table>
| 9. Temporary storage of manure and/or solid prescribed materials | Manure is not stored more than the calculated maximum number of days of temporary storage as determined by OMAFRA Factsheet Temporary Field Storage of Solid Manure or Prescribed Materials. And all 11 of the following site requirements are met:  
• Minimum depth of soil to bedrock under the site and within 3 m (10 ft) of the side of the site is more than 0.3 m (1 ft)  
• Minimum depth of soil above the water table under the site and within 3 m (10 ft) of the side of the site is more than 0.9 m (3 ft)  
• The site is not located on an AA Hydrologic Soil Group  
• The storage site is not located in an area that, according to the flood plain mapping provided by the municipality or conservation authority, is subject to flooding more than once every 100 years.  
• The site does not have a slope greater than 3%.  
• There is a flow path that is at least 50 m (165 ft) to the nearest surface water or tile inlet, and located at least 0.3 m (1 ft) above bedrock.  
The site is not located within:  
• 45 m (150 ft) of a drilled well that has a depth of at least 6 m (20 ft) and a watertight casing to a depth of at least 6 m (20 ft) below ground level  
• 90 m (300 ft) of any other well, other than a municipal well  
• 100 m (330 ft) of a municipal well  
• 125 m (410 ft) of a single residence, or within 250 m (825 ft) of a residential area, if the area is used for storing manure, or other prescribed materials (but, not de-watered municipal sewage biosolids)  
• 200 m (660 ft) of a single residence, or within 450 m (1500 ft) of a residential area, if the area is used for storing de-watered municipal sewage biosolids | Manure/other prescribed material is not stored more than the calculated maximum number of days of temporary storage as determined by OMAFRA Factsheet Temporary Field Storage of Solid Manure or Prescribed Materials and 5 or more site requirements listed in the BEST column are met | Manure/other prescribed material is stored for more than the calculated maximum number of days of temporary storage as determined by OMAFRA Factsheet Temporary Field Storage of Solid Manure or Prescribed Materials and less than 5 site requirements in the BEST column are met | Manure/other prescribed material is stored in the same location year after year with no regard for management or site conditions and maximum number of days of storage |
### Table 1: Runoff Potential

<table>
<thead>
<tr>
<th>Hydrologic Soil Group (Drainage Class)</th>
<th>Maximum field slope within 150 m (500 ft) of surface water</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (Rapid)</td>
<td>&lt;3%</td>
</tr>
<tr>
<td>B (Moderate)</td>
<td>3 - &lt;6%</td>
</tr>
<tr>
<td>C (Slow)</td>
<td>6 - &lt;9%</td>
</tr>
<tr>
<td>D (Very Slow)</td>
<td>9 - &lt;12%</td>
</tr>
<tr>
<td></td>
<td>Very Low</td>
</tr>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>High</td>
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<tr>
<td></td>
<td>High</td>
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<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>High</td>
</tr>
</tbody>
</table>

Hydrologic Soil Groups for each field were determined in Worksheet 1 – Soil and Site Evaluation for each field. Group A is often associated with sand, Group B with loam, Group C with clay loam and Group D with clay soil textures.

Source: OMAFRA Publication 818 Nutrient Management Workbook (Table 1)

### Table 2: Minimum Separation Distances from Surface Water Sources (including established 3m buffer) for manure

<table>
<thead>
<tr>
<th>Runoff Potential (From Table 1)</th>
<th>Pre-crop year – Unincorporated on bare soil</th>
<th>Planted Vineyard or Pre-crop year - Incorporated or applied to a living cover crop or green manure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Liquid</td>
<td>Solid</td>
</tr>
<tr>
<td>High</td>
<td>30 m (100 ft)</td>
<td>15 m (50 ft)</td>
</tr>
<tr>
<td>Moderate</td>
<td>25.5 m (75 ft)</td>
<td>12 m (40 ft)</td>
</tr>
<tr>
<td>Low</td>
<td>15 m (50 ft)</td>
<td>12 m (40 ft)</td>
</tr>
<tr>
<td>Very Low</td>
<td>12 m (40 ft)</td>
<td>12 m (40 ft)</td>
</tr>
</tbody>
</table>

Source: OMAFRA Publication 818 Nutrient Management Workbook (Table 15)
**Viticulture Worksheet 7: Crop Management**

(Pilot Addendum to EFP Worksheets #18)

<table>
<thead>
<tr>
<th>Rating</th>
<th>Best 4</th>
<th>3</th>
<th>2</th>
<th>1 Sites</th>
<th>YOUR RATING</th>
</tr>
</thead>
</table>
| 1. Vineyard establishment | Any 4 or more of the following 6 items:  
- Know where easements or locations are for hydro, gas, roads, and drains  
- Map site contour levels and drainage patterns  
- Create a site vegetation plan that incorporates existing and new plantings for optimum air drainage, disease management, noise buffers, wildlife corridors, maintenance of native species and fish habitat, and soil erosion control  
- Maintain vegetated buffer strips next to watercourses and on headlands (properly sized for equipment turning)  
- Understand soil profile and texture limitations to production (i.e. textural changes that reduce drainage)  
- Understand principles of cold air drainage and  
  All necessary permits have been obtained (e.g. Niagara Escarpment Commission, Conservation Authorities, etc.) | Any 3 items in BEST column and  
All necessary permits have been obtained (e.g. Niagara Escarpment Commission, Conservation Authorities, etc.) | Any 2 items in BEST column  
and  
All necessary permits have been obtained (e.g. Niagara Escarpment Commission, Conservation Authorities, etc.) | Any 1 or no items in BEST column  
and  
Necessary permits not obtained (e.g. Niagara Escarpment Commission, Conservation Authorities, etc.) | [ ] | [ ] | [ ] | [ ] | [ ] |
| 2. Vineyard design | Any 4 or more of the following 6 items:  
- Consider the physical characteristics including woodlots, existing vegetation, drainage lines, waterways and cold air drainage lines when determining row orientation and length  
- Minimize equipment turnaround next to any public roadways  
- Minimize erosion  
- Incorporates slope of land, wind patterns and sun exposure  
- Choose a trellis system to match variety and optimize canopy management, and good air flow and spray penetration  
- Adjust vine spacing for soil fertility and vigour management | Any 3 items in BEST column | Any 2 items in BEST column | Any 1 or no items in BEST column | [ ] | [ ] | [ ] | [ ] | [ ] |
<table>
<thead>
<tr>
<th>Rating</th>
<th>Best 4</th>
<th>3</th>
<th>2</th>
<th>1 Sites</th>
<th>YOUR RATING</th>
</tr>
</thead>
</table>
| 3. Soil and drainage | Any 3 or more of the following 5 items:  
  - Tile drains spaced according to soil drainage characteristics (texture and profile) and installed at optimum depths  
  - Understand common law drainage problems  
  - Incorporate organic matter (manure, compost, green manure)  
  - Control perennial weeds, prior to planting  
  - Sample for nematodes | Any 2 or less items in BEST column | | | |
| 4. Grape variety selection & planting location | All of the following items:  
  - Attend workshops to identify current information on winter hardiness, disease resistance and vigour control for varieties and rootstocks  
  - Investigate grape varieties appropriate for soil fertility, local climate conditions, and site disease history  
  - Monitor on-site temperature conditions for five years prior to planting and identify history of weather patterns from closest reliable source (e.g. Environment Canada, Airport, Research station)  
  - Participate in trials and share information | Any 3 items in BEST column | Any 2 items in BEST column | Any 1 or no items in BEST column | | |
| 5. Seasonal management before winter | Any 4 or more of the following 5 items:  
  - Avoid September irrigation to reduce vigour  
  - Use training systems allowing good sunlight exposure to improve wood ripening  
  - Vine renewal strategy in place in case of winter cold injury  
  - Management regime in place to ensure healthy vines prior to onset of winter  
  - Remove crown gall before winter | Any 3 items in BEST column | Any 2 items in BEST column | Any 1 or no items in BEST column | | |
Viticulture Worksheet 8: Pest Management

(Pilot Addendum to EFP Worksheets #20)

Integrated pest management (IPM) is an approach to pest control that considers all management options to maintain pests below an economic injury level. Tools for the management of pests include cultural, physical, biological, behavioural and chemical methods. With IPM, adverse effects of pest management are minimized and economic returns are maintained.

IPM programs make extensive use of information collected in the cropping system and require careful management by the grower. To implement an IPM program you must understand:

- Pest identification, biology and behaviour
- Beneficial organisms
- Monitoring techniques
- Use and timing of appropriate management tools
- Record keeping
- Resistance management strategies
- Weed management
- Sprayer calibration

Information on IPM is available in OMAFRA Publication 360 – Fruit Production Recommendations and other OMAFRA publications and factsheets.

What can you do?

1. Learn about IPM strategies through OMAFRA and other resources.
2. Implement a reliable, regular monitoring program for each farm you operate.
3. Understand pest thresholds (where established) so that sprays are only applied when economically justified.
4. Use products and practices that are the least harmful to beneficial organisms.
5. Explore non-chemical means of pest control whenever available.

<table>
<thead>
<tr>
<th>Rating</th>
<th>Best</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>Sites</th>
<th>YOUR RATING</th>
</tr>
</thead>
</table>
| 1. Pest monitoring (general) | Any 5 or more of the following 6 items:  
- Vineyards are monitored for pests on a reliable and consistent basis  
- Monitor for beneficial insects and mites and consider these in your pest management decisions  
- Information obtained from pest monitoring is used to help make pest management decisions  
- Disease forecasting or prediction models are used (when available) to time fungicide applications  
- Action thresholds based on pest or damage levels (where established) are used to make pest management decisions  
- Regional pest reports are used (where available) to help refine monitoring procedures | Any 4 items in BEST column | Any 2 or 3 items in BEST column | Any 1 or no items in BEST column | □ | □ | □ | □ | □ |
<table>
<thead>
<tr>
<th>Rating</th>
<th>Best 4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>Sites</th>
<th>YOUR RATING</th>
</tr>
</thead>
</table>
| 2. Pest management (general) | Any 3 or more of the following 4 items:  
- Alternatives to pesticides are investigated and used  
- Reduced risk, IPM compatible pesticides are chosen wherever possible  
- Information on relative product toxicity is referred to when choosing pesticides (OMAFRA Publication 360 – Fruit Production Recommendations 2006-2007, page 3, Table 1-2, "Relative Acute Toxicity of Pesticides")  
- Rotation of pesticide families is used to reduce risk of pesticide resistance development | Any 2 items in BEST column | Any 1 item in BEST column | No items in BEST column | | |
| 3. Insect monitoring and management | Any 4 or more of the following 5 items:  
- You or your consultant undertake regular insect monitoring  
- Controls are only implemented based on monitoring and thresholds being exceeded  
- A targeted insecticide is used instead of a broad spectrum insecticide when control of only one insect is required  
- Treat only the hotspot where treatment is needed (e.g. border sprays are often sufficient for grape berry moth).  
- Regularly update and remind employees on ways to monitor and manage pests | Any 3 items in BEST column | Any 2 items in BEST column | Any 1 or no items in BEST column | | |
| 4. Alternative insect management techniques | Any 2 or more of the following 3 items:  
- Cultural practices are used to reduce dust for mite suppression (e.g. control speed of vehicles in laneways and roads, etc.)  
- Cultural practices for control of insects and mites are used (e.g. leaf removal and controlling vine vigour, etc.)  
- Mating disruption for grape berry moth is used | Any 1 item in BEST column | | No items in BEST column | | |
| 5. Disease monitoring | All of the following:  
- Monitor for diseases at least weekly and keep a written record  
- Consult weather forecasts and regional crop reports to determine when conditions are likely to be optimal for infection to occur and vines are susceptible to infection  
- Regularly update and remind employees on ways to monitor and manage diseases | Any 2 items in BEST column | | No items in BEST column | | |
<table>
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<tr>
<th>Rating</th>
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| 6. Fungicide product choice | All of the following:  
- Select products with the most efficacy during the periods of peak susceptibility of fruit to powdery mildew, downy mildew, black rot and botrytis bunch rot  
- Select fungicides based on their spectrum of activity (i.e. know which fungicides control one or more of the major fungal diseases).  
- Rotate among fungicide families to delay the development of resistance in pathogens  
- Avoid the application of site-specific fungicides once sporulation is observed  
- Use reduced-risk products where available  
- Use fungicides that are least prone to be washed off by rain or irrigation; fungicides only reapplied when necessary | Any 3 or 4 items in BEST column | Any 1 or 2 items in the BEST column | No items in BEST column |
| 7. Cultural practices for disease management | All of the following:  
- Use cultural practices to help reduce disease incidence and promote better spray coverage on berries such as canopy management, leaf removal and shoot thinning or positioning, remove infected prunings from the vineyard and burn; cultivate infected leaves/fruit to reduce spore release  
- If you use overhead irrigation, time the application to allow the shortest drying time possible to reduce conditions for fungal infection  
- Minimize physical damage to fruit caused by insects, spray toxicity, canopy management or early powdery mildew to reduce susceptibility of fruit to bunch rot | Any 2 items in BEST column | Any 1 item in BEST column | No items in BEST column |
| 8. Weed monitoring | All of the following:  
- Regularly monitor the vineyard for weeds  
- Map weeds to assist in future control and keep maps for a number of years  
- Scout for new weeds and spot treat patches  
- Look for sources of weeds and eradicate the sources | Any 2 items in BEST column | Any 1 item in BEST column | No items in BEST column |
| 9. Weed biology | All of the following:  
- Know the lifecycle of the weeds in your vineyard (e.g. annual, biannual or perennials)  
- Use lifecycle of your weeds to choose optimum time and method to manage them  
- You focus on targeting weeds at their most susceptible stage | Any 2 items in BEST column | Any 1 item in BEST column | No items in BEST column |
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| **10. Weed management**       | All of the following:  
  - Target weed control during the crops critical weed free period (i.e. early spring and summer)  
  - Mechanical means as well as spraying is used to keep the area under vines weed-free  
  - Target spot sprays are used rather than spraying the whole vineyard area through the season  
  - Choose herbicides with the least leaching potential and impact on water and soil  
  - Clean equipment between fields and weedy areas  
  - Manage row middles to reduce weed pressure  
  - Manage weeds on field edges to reduce seed set | Any 5 items in BEST column | Any 2 to 4 items in BEST column | Any 1 item in BEST column | | | | | | |
| **11. Pesticide application in vineyards** | Any 7 or more of the following 8 items:  
  - Follow minimum times required before last spray application and harvest  
  - Sprayers, when used are calibrated to ensure complete coverage of upper and lower leaf surfaces and all sides of the cluster and adjust application for fruiting zone-specific sprays (bunch rot, GJM)  
  - Check coverage of the sprayer (e.g. with water sensitive paper or spray, or use of a dye spray or a benign spray such as kaolin clay) and replace worn nozzles every year  
  - Monitor nozzle performance regularly each time you spray  
  - Adjust your operating practices e.g. recalibrate and check coverage as width of row changes and when spray volume changes due to canopy density  
  - Spray technologies that minimize drift and sprays, (e.g. hooded recycling sprayer or low volume sprayer) are used  
  - When purchasing equipment you consider low pressure, low volume, targeted, recycling type sprayers (rather than non targeted air blast sprayer)  
  - Ensure that there is no off site spray drift | Any 6 items in BEST column | Any 4 or 5 items in BEST column | Any 3 or less items in BEST column | | | | | | |
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| 12. Vertebrate management (e.g. birds, deer, groundhogs, raccoons, etc.) | Any 10 or more of the following 12 items:  
- Monitor your vineyard regularly for vertebrate pests (e.g. birds, deer, groundhogs and raccoons)  
- Identify how much loss you are prepared to accept before taking any action to reduce impact  
- Discuss with the Conservation Authority about ways of modifying the habitat to increase predators and reduce grape loss  
- Several different approaches to reduce bird damage such as reflectors, kites, hawks, noise deterrents and netting are used  
- Ensure proper clipping of netting to keep birds out  
- Multiyear, reusable netting is used where possible  
- Systematic checks on nets to humanely remove birds/animals accidentally caught  
- Old netting is recycled, where available and not burned  
- You have considered exclusion fencing for vertebrates to replace lethal means of control  
- Only problem areas of the vineyard are treated for vertebrate pests  
- Raptor perches and nest boxes are installed near the vineyard to encourage predators  
- If you use shooting, ensure that non lead ammunition is used | Any 8 or 9 items in BEST column | Any 6 or 7 items in BEST column | Less than 6 items in BEST column | □ | □ | □ | □ | □ |
## Viticulture Worksheet 9: Stream, Ditch and Floodplain

(Pilot Addendum to EFP Worksheets #21)

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<tbody>
<tr>
<td>1. Approvals for water course changes</td>
<td>All approvals for modifications to watercourses (e.g. dams, crossings, flow relocating, etc.) have been obtained (including permits from Department of Fisheries and Oceans, Ontario Ministry of Environment, Conservation Authorities, Municipalities and Niagara Escarpment Commission, etc.) and all permitted conditions have been met.</td>
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<td>Modifications were made with no approvals</td>
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| 2. Tile drainage | Any 5 or more of the following 7 items:  
- You have identified and mapped all drainage on the farm (location of tiles, municipal drains, drop inlets, hickenboorths, and tile outlets)  
- Drains are kept clear of vegetation (i.e. tree roots)  
- Drains outlets are kept clear  
- Rodent guards are installed on tile drain outlets and are regularly maintained  
- Tile outlets are not eroding ditch banks  
- Tile drainage system is designed to reduce potential erosion (e.g. use of headers to collect water from several tile runs)  
- Good soil management practices are conducted to maintain internal soil drainage to tiles (e.g. minimum tillage, prevent compaction, use of green manure and cover crops) | Any 4 items in BEST column | Any 3 items in BEST column | Less than 3 items in BEST column | □ □ □ □ □ |
| 3. Municipal drain management | Any 4 or more of the following 5 items:  
- Buildings and trees or vines are kept a sufficient distance from the drain to allow for maintenance.  
- Proper requirements were achieved for bridge, culvert or dam construction or maintenance  
- Debris (brush or plastics, etc.) are kept a sufficient distance away from drains so storm water does not allow them to enter drains.  
- Proper procedures and appropriate approvals are followed regarding drain maintenance.  
- Spoils are not piled adjacent to drain edge, used to raise drain banks, or fill in eroded areas along the drain and  
- All pesticides, fertilizers, waste waters, manure run-off, fuels, septage, etc. do not enter drains | Any 3 items in BEST column and  
All pesticides, fertilizers, waste waters, manure run-off, fuels, septage, etc. do not enter drains | Any 2 items in BEST column and  
All pesticides, fertilizers, waste waters, manure run-off, fuels, septage, etc. do not enter drains | Any 1 item in BEST column and/or  
pesticides, fertilizers, waste waters, manure run-off, fuels, septage, etc. enter drains | □ □ □ □ □ |
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<td>4. Watershed</td>
<td>You know which watershed(s) your vineyard is in and you contribute to or participate in planning for watershed protection efforts undertaken by your Conservation Authority</td>
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Grape Growers of Ontario

Or your local OSCIA Program Representative
www.onioscianet.org
1-866-265-3751
NTC 472
Quebec, Ontario
1 Stone Road West

Ontario Soil and Crop Improvement Association
For more information contact:

An Environmental Charter for the Wine Industry
Sustainable Winemaking Ontario:
Developed for Ontario Viticulture Sector as a component of
Environmental Farm Plan (EFP) Program
Viticulture Pilot Addendum to the Canada-Ontario

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Wine Council of Ontario