

12. Appendices

Appendix A. Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) Floriculture Advisory Staff

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Vineland, Department of Plant Agriculture
University of Guelph
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Vineland, Department of Plant Agriculture
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A complete list of Ontario Ministry of Agriculture, Food and Rural Affairs advisory staff is available on the ministry website at www.ontario.ca/crops.

Agricultural Information Contact Centre

Provides province-wide, toll-free technical and business information to commercial farms, agri-businesses and rural businesses.
1 Stone Rd. W.
Guelph, ON N1G 4Y2
Tel: 519-826-4047
Toll-free: 1-877-424-1300
Fax: 519-826-7610
Email: ag.info.omafra@ontario.ca

Appendix B. Ontario Ministry of the Environment and Climate Change – Regional Offices Contact Information

| REGION County | Address | Telephone/Fax |
|--|--|---|
| Central Region Toronto, Halton, Peel York, Durham | 5775 Yonge St., 8th Floor Toronto, ON M2M 4J1 | Tel: 416-326-6700 Toll-free: 1-800-810-8048 Fax: 416-325-6345 |
| West-Central Region Haldimand-Norfolk, Niagara, Hamilton-Wentworth, Dufferin, Wellington, Waterloo, Brant | Ontario Government Building 119 King St. W., 12th Floor Hamilton, ON L8P 4Y7 | Tel: 905-521-7640 Toll-free: 1-800-668-4557 Fax: 905-521-7820 |
| Eastern Region Frontenac, Hastings, Lennox & Addington, Prince Edward, Leeds & Grenville, Prescott & Russell, Stormont/Dundas & Glengarry, Haliburton, Peterborough, Victoria, Northumberland, Renfrew, Ottawa-Carleton, Lanark, (Townships of Airy, Murchison, Dickens, Lyell and Sabine) | P.O. Box 22032 1259 Gardiners Rd., Unit 3 Kingston, ON K7M 8S5 | Tel: 613-549-4000 Toll-free: 1-800-267-0974 Fax: 613-548-6908 |
| Southwestern Region Elgin, Middlesex, Oxford, Essex, Kent, Lambton, Bruce, Grey, Huron, Perth, Simcoe | 733 Exeter Rd., 2nd Floor London, ON N6E 1L3 | Tel: 519-873-5000 Toll-free: 1-800-265-7672 Fax: 519-873-5020 |
| Northern Region | Thunder Bay Regional and District Office 435 James St. S., Suite 331 Thunder Bay, ON P7E 6S7 | Tel: 807-475-1205 Toll-free: 1-800-875-7772 Fax: 807-475-1754 |
| | Sudbury District Office 199 Larch St., Suite 1201 Sudbury, ON P3E 5P9 | Tel: 705-564-3237 Toll-free: 1-800-890-8516 Fax: 705-564-4180 |
| | Timmins District Office Ontario Government Complex P.O. Bag 3080 5520 Hwy 101 East South Porcupine, ON P0N 1H0 | Tel: 705-235-1500 Toll-free: 1-800-380-6615 Fax: 705-235-1520 |
| Standards Development Branch | Pesticides Section 40 St. Clair Ave. W., 7th Floor Toronto, ON M4V 1M2 | Tel: 416-327-5519 Fax: 416-327-2936 |
| Approvals Branch | Pesticides Licensing 2 St. Clair Ave. W., 12A Floor Toronto, ON M4V 1L5 | Tel: 416-314-8001 Toll-free: 1-800-461-6290 Fax: 416-314-8452 |

Appendix C. Greenhouse Media, Nutrient Solutions and Tissue Testing Laboratories in Ontario

Contact the individual laboratory for a listing of greenhouse-related analytical tests available.

| Company | Address | Contact Details | Contact |
|---|--|---|---------------------------------|
| Agri-Food Laboratories | 503 Imperial Rd., Unit #1 Guelph, ON N1H 6T9 | Tel: 519-837-1600 Toll-free: 1-800-265-7175 Fax: 519-837-1242 Website: www.agtest.com Email: ca.agri.guelph.lab@sgs.com | Jack Legg |
| Stratford Agri Analysis Inc. | P.O. Box 760 1131 Erie St. Stratford, ON N5A 6W1 | Tel: 519-273-4411 Toll-free: 1-800-323-9089 Fax: 519-273-4411 Website: www.stratfordagri.ca Email: info@stratfordagri.ca | Keith Lemp Tina Beaucage |
| A & L Canada Laboratories East | 2136 Jetstream Rd. London, ON N5V 3P5 | Tel: 519-457-2575 Toll-free: 1-855-837-8347 Fax: 519-457-2664 Website: www.alcanada.com Email: alcanadalabs@alcanada.com | Ian McLachlin Greg Patterson |
| Exova Accutest Laboratories | 146 Colonnade Rd., Unit #8 Nepean, ON K2E 7Y1 | Tel: 613-727-5692 Fax: 613-727-5222 Website: www.exova.ca Email: lorna.wilson@exova.com | Lorna Wilson |
| Forest Resources and Soils Testing Laboratory | 955 Oliver Rd., Thunder Bay, ON P7B 5E1 | Tel: 807-343-8639 Lab: 807-343-8026 Website: www.lucas.lakeheadu.ca/forest/ Email: forestlab@lakeheadu.ca | Joel Symonds Breanne Neufeld |
| Soil and Nutrient Lab | University of Guelph, 95 Stone Rd. W. Guelph, ON N1H 8J7 | Tel: 519-767-6226 Toll-free: 1-877-863-4235 Fax: 519-767-6240 Website: www.guelphlabservices.com/ Email: affinfo@uoguelph.ca | Nick Schrier |

Appendix D. Other Contacts

Agriculture and Agri-Food Canada Research Centres

Eastern Cereals and Oilseeds Research Centre

960 Carling Ave.
Ottawa, ON K1A 0C6
Tel: 613-759-1952
Website: www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1180546650582&lang=e

Greenhouse and Processing Crops Centre

2585 County Road 20
Harrow, ON NOR 1G0
Tel: 519-738-2251
Website: www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1180624240102&lang=e

Southern Crop Protection and Food Research Centre

1391 Sandford St.
London, ON N5V 4T3
Tel: 519-457-1470
Website: www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1180640801098&lang=e

Vineland Research Farm
4902 Victoria Ave. N.
Vineland, ON LOR 2E0
Tel: 905-562-4113

Canadian Food Inspection Agency Regional Offices (Plant Protection)

www.inspection.gc.ca/english/toce.shtml

Belleville
345 College St. E.
Belleville, ON K8N 5S7
Tel: 613-969-3332

Brantford
625 Park Rd. N., Unit 6
Brantford, ON N3T 5L8
Tel: 519-753-3478

Hamilton
709 Main St. W., Suite 101
Hamilton, ON L8S 1A2
Tel: 905-572-2201

London
1200 Commissioners Rd. E., Unit 19
London, ON N5Z 4R3
Tel: 519-691-1300
Fax: 519-691-1314

Niagara Falls
P.O. Box 9, 350 Ontario St., Unit 13
St. Catharines, ON L2R 5L8
Tel: 905-357-5981

Ottawa District
38 Auriga Dr., Room 8
Ottawa, ON K2E 8A5
Tel: 613-274-7374, ext. 221

Toronto
1124 Finch Ave. W., Unit 2
Downsview, ON M3J 2E2
Tel: 416-665-5055
Fax: 416-665-5069

University of Guelph

Main Campus
Guelph, ON N1G 2W1
Tel: 519-824-4120
Website: www.uoguelph.ca

Alfred College
Alfred, ON K0B 1A0
Tel: 613-679-2218
Fax: 613-679-2423
Website: www.alfredc.uoguelph.ca

Kemptville College
Kemptville, ON K0G 1J0
Tel: 613-258-8336
Fax: 613-258-8384
Website: www.kemptvillec.uoguelph.ca

Ridgetown College
Ridgetown, ON N0P 2C0
Tel: 519-674-1500
Website: www.ridgetownc.on.ca

Department of Plant Agriculture
Website: www.plant.uoguelph.ca

Department of Plant Agriculture, Guelph
50 Stone Rd. E.
Guelph, ON N1G 2W1
Tel: 519-824-4120, ext. 56083
Fax: 519-763-8933

Department of Plant Agriculture, Simcoe
P.O. Box 587, 1283 Blueline Rd.
Simcoe, ON N3Y 4N5
Tel: 519-426-7127
Fax: 519-426-1225

Department of Plant Agriculture, Vineland
P.O. Box 7000, 4890 Victoria Ave. N.
Vineland Station, ON LOR 2E0
Tel: 905-562-4141
Fax: 905-562-3413

Lab Services Division

Website: www.uoguelph.ca/labserv
Pesticide and Trace Contaminants
P.O. Box 3650, 95 Stone Rd. W.
Guelph, ON N1H 8J7
Tel: 519-767-6299
Pest Diagnostic Clinic
Tel: 519-767-6256

Vineland Research and Innovation Centre

P.O. Box 4000, 4890 Victoria Ave. N.
Vineland Station, ON LOR 2E0
Tel.: 905-562-0320
Fax: 905-562-0084
Website: www.vinelandontario.ca

Appendix E. Diagnostic Service

Samples for disease diagnosis, insect or weed identification, nematode counts and *Verticillium* testing can be sent to:

Pest Diagnostic Clinic
Laboratory Services Division
University of Guelph
95 Stone Rd. W.
Guelph, ON N1H 8J7
Tel: 519-767-6299
Fax: 519-767-6240
Website: www.guelphlabservices.com
Email: afinfo@uoguelph.ca
Payment must accompany samples at the time of submission.
Submission forms are available at:
www.guelphlabservices.com/AFL/submit_samples.aspx

How to sample for nematodes

Soil

When to sample

Soil and root samples can be taken at any time of the year that the soil is not frozen. In Ontario, nematode soil population levels are generally at their highest in May and June, and again in September and October.

How to sample soil

Use a soil sampling tube, trowel or narrow-bladed shovel to take samples. Sample soil to a depth of 20–25 cm (8–10 in.). If the soil is bare, remove the top 2 cm (1 in.) prior to sampling. A sample should consist of 10 or more subsamples combined. Mix well. Then take a sample of 0.5–1 L (1 pint–1 quart) from this. No single sample should represent more than 2.5 ha (6.25 ac). Mix subsamples in a clean pail or plastic bag.

Sampling pattern

If living crop plants are present in the sample area, take samples within the row and from the area of the feeder root zone (with trees, this is the drip line).

Number of subsamples

| | |
|---|---------------|
| Based on the total area sampled: | |
| 500 m ² (5,400 ft ²) | 10 subsamples |
| 500 m ² –0.5 ha (5,400 ft ² –1.25 ac) | 25 subsamples |
| 0.5 ha–2.5 ha (1.25–6.25 ac) | 50 subsamples |

Roots

From small plants, sample the entire root system plus adhering soil. For large plants 10–20 g (½–1 oz.), dig fresh weight from the feeder root zone and submit.

Problem areas

Take soil and root samples from the margins of the problem area where the plants are still living. If possible, also take samples from healthy areas in the same field. If possible, take both soil and root samples from problem and healthy areas in the same field.

Sample handling

Soil samples

Place in plastic bags as soon as possible after collecting.

Root samples

Place in plastic bags and cover with moist soil from the sample area.

Storage

Store samples at 5–10°C (40–50°F) and do not expose them to direct sunlight or extreme heat or cold (freezing). Only living nematodes can be counted. Accurate counts depend on proper handling of samples.

Submitting plants for disease diagnosis or identification

Sample submission forms

Forms can be obtained from your local Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) office. Carefully fill in all of the categories on the form. In the space provided, draw the most obvious symptom and the pattern of the disease in the field. It is important to include the cropping history of the area for the past three years and pesticide use records from this year.

Choose a complete, representative sample showing early symptoms. Submit as much of the plant as is practical, including the root system or several plants showing a range of symptoms. If symptoms are general, collect the sample from an area where they are of intermediate severity. Completely dead material is usually inadequate for diagnosis.

With plant specimens submitted for identification, include at least a 20–25 cm sample of the top portion of the stem with lateral buds, leaves, flowers or fruits in identifiable condition. Wrap plants in newspaper and put in a plastic bag. Tie the root system off in a separate plastic bag to avoid the soil drying out and contaminating the leaves. Do not add moisture, as this encourages decay in transit. Cushion specimens and pack in a sturdy box to avoid damage during shipping. Avoid leaving specimens to bake or freeze in a vehicle or in a location where they could deteriorate.

Delivery

Deliver to the Pest Diagnostic Clinic as soon as possible by first class mail or courier at the beginning of the week.

Submitting insect specimens for identification

Collecting samples

Place dead, hard-bodied insects in vials or boxes and cushion with tissues or cotton. Place soft-bodied insects and caterpillars in vials containing alcohol. Do not use water, as this results in rot. Do not tape insects to paper or send them loose in an envelope.

Place live insects in a container with enough plant “food” to support them during transit. Be sure to write “live” on the outside of the container.

Appendix F. The Metric System

Metric units

Linear measures (length)

| | | |
|----------------------|---|-------------------|
| 10 millimetres (mm) | = | 1 centimetre (cm) |
| 100 centimetres (cm) | = | 1 metre (m) |
| 1,000 metres | = | 1 kilometre (km) |

Square measures (area)

| | | |
|---------------------------------------|---|---------------------------------------|
| 100 m × 100 m = 10,000 m ² | = | 1 hectare (ha) |
| 100 ha | = | 1 square kilometre (km ²) |

Cubic measures (volume)

Dry measure

| | | |
|--|---|---------------------------------------|
| 1,000 cubic millimetres (mm ³) | = | 1 cubic centimetre (cm ³) |
| 1,000,000 cm ³ | = | 1 cubic metre (m ³) |

Liquid measure

| | | |
|------------------------|---|-------------------|
| 1,000 millilitres (mL) | = | 1 litre (L) |
| 100 L | = | 1 hectolitre (hL) |

Weight-volume equivalents (for water)

| | | |
|-----------------------|---|------------------|
| (1.00 kg) 1,000 grams | = | 1 litre (1.00 L) |
| (0.50 kg) 500 g | = | 500 mL (0.50 L) |
| (0.10 kg) 100 g | = | 100 mL (0.10 L) |
| (0.01 kg) 10 g | = | 10 mL (0.01 L) |
| (0.001 kg) 1 g | = | 1 mL (0.001 L) |

Weight measures

| | | |
|-----------------------|---|--------------------------|
| 1,000 milligrams (mg) | = | 1 gram (g) |
| 1,000 g | = | 1 kilogram (kg) |
| 1,000 kg | = | 1 tonne (t) |
| 1 mg/kg | = | 1 part per million (ppm) |

Dry-liquid equivalents

| | | |
|-------------------|---|--------|
| 1 cm ³ | = | 1 mL |
| 1 m ³ | = | 1000 L |

Metric conversions (approximate)

| | | |
|---------|---|-----------|
| 5 mL | = | 1 tsp |
| 15 mL | = | 1 tbsp |
| 28.5 mL | = | 1 fl. oz. |

Application rate conversions

Metric to Imperial or U.S. (approximate)

| | | |
|---------------------------------|---|----------------------------|
| litres per hectare × 0.09 | = | Imp. gallons per acre |
| litres per hectare × 0.11 | = | U.S. gallons per acre |
| litres per hectare × 0.36 | = | Imp. quarts per acre |
| litres per hectare × 0.43 | = | U.S. quarts per acre |
| litres per hectare × 0.71 | = | Imp. pints per acre |
| litres per hectare × 0.86 | = | U.S. pints per acre |
| millilitres per hectare × 0.014 | = | U.S. fluid ounces per acre |
| grams per hectare × 0.015 | = | ounces per acre |
| kilograms per hectare × 0.89 | = | pounds per acre |
| tonnes per hectare × 0.45 | = | tons per acre |

Application rate conversions (con't)

Imperial or U.S. to metric (approximate)

| | | |
|---------------------------------|---|---------------------------------|
| Imp. gallons per acre × 11.23 | = | litres per hectare (L/ha) |
| U.S. gallons per acre × 9.35 | = | litres per hectare (L/ha) |
| Imp. quarts per acre × 2.8 | = | litres per hectare (L/ha) |
| U.S. quarter per acre × 2.34 | = | litres per hectare (L/ha) |
| Imp. pints per acre × 1.4 | = | litres per hectare (L/ha) |
| U.S. pints per acre × 1.17 | = | litres per hectare (L/ha) |
| Imp. fluid ounces per acre × 70 | = | millilitres per hectare (mL/ha) |
| U.S. fluid ounces per acre × 73 | = | millilitres per hectare (mL/ha) |
| tons per acre × 2.24 | = | tonnes per hectare (t/ha) |
| pounds per acre × 1.12 | = | kilograms per hectare (kg/ha) |
| pounds per acre × 0.45 | = | Kilograms per acre (kg/acre) |
| ounces per acre × 70 | = | grams per hectare (g/ha) |

Liquid rate conversions (approximate)

| litres/hectare | approximate gallons/acre |
|----------------|--------------------------|
| 50 L/ha | = 5 gal./acre |
| 100 L/ha | = 10 gal./acre |
| 150 L/ha | = 15 gal./acre |
| 200 L/ha | = 20 gal./acre |
| 250 L/ha | = 25 gal./acre |
| 300 L/ha | = 30 gal./acre |

Dry weight rate conversions (approximate)

| grams or kilograms/hectare | ounces or pounds/acre |
|----------------------------|-----------------------|
| 100 g/ha | = 1½ oz./acre |
| 200 g/ha | = 3 oz./acre |
| 300 g/ha | = 4¾ oz./acre |
| 500 g/ha | = 7 oz./acre |
| 700 g/ha | = 10 oz./acre |
| 1.10 kg/ha | = 1 lb./acre |
| 1.50 kg/ha | = 1¼ lb./acre |
| 2.00 kg/ha | = 1¾ lb./acre |
| 2.50 kg/ha | = 2¼ lb./acre |
| 3.25 kg/ha | = 3 lb./acre |
| 4.00 kg/ha | = 3½ lb./acre |
| 5.00 kg/ha | = 4½ lb./acre |
| 6.00 kg/ha | = 5¼ lb./acre |
| 7.50 kg/ha | = 6¾ lb./acre |
| 9.00 kg/ha | = 8 lb./acre |
| 11.00 kg/ha | = 10 lb./acre |
| 13.00 kg/ha | = 11½ lb./acre |
| 15.0 kg/ha | = 13½ lb./acre |

**Conversion tables –
metric to imperial (approximate)**

Length

| | | |
|-------------------|---|--------------|
| 1 millimetre (mm) | = | 0.04 inch |
| 1 centimetre (cm) | = | 0.40 inch |
| 1 metre (m) | = | 39.40 inches |
| 1 metre (m) | = | 3.28 feet |
| 1 metre (m) | = | 1.09 yards |
| 1 kilometre (km) | = | 0.62 mile |

Area

| | | |
|--|---|---------------------|
| 1 square centimetre (cm ²) | = | 0.16 square inch |
| 1 square metre (m ²) | = | 10.77 square feet |
| 1 square metre (m ²) | = | 1.20 square yards |
| 1 square kilometre (km ²) | = | 0.39 square mile |
| 1 hectare (ha) | = | 107,636 square feet |
| 1 hectare (ha) | = | 2.5 acres |

Volume (dry)

| | | |
|---------------------------------------|---|------------------|
| 1 cubic centimetre (cm ³) | = | 0.061 cubic inch |
| 1 cubic metre (m ³) | = | 1.31 cubic yards |
| 1 cubic metre (m ³) | = | 35.31 cubic feet |
| 1,000 cubic metres (m ³) | = | 0.81 acre-foot |
| 1 hectolitre (hL) | = | 2.8 bushels |

Volume (liquid)

| | | |
|-------------------|---|--------------------|
| 1 millilitre (mL) | = | 0.035 fluid ounce |
| 1 litre (L) | = | 1.76 pints |
| 1 litre (L) | = | 0.88 quart |
| 1 litre (L) | = | 0.22 gallon (Imp.) |
| 1 litre (L) | = | 0.26 gallon (U.S.) |

Weight

| | | |
|-----------------|---|-----------------|
| 1 gram (g) | = | 0.035 ounce |
| 1 kilogram (kg) | = | 2.21 pounds |
| 1 tonne (t) | = | 1.10 short tons |
| 1 tonne (t) | = | 2,205 pounds |

Pressure

| | | |
|--------------------|---|------------------------------|
| 1 kilopascal (kPa) | = | 0.15 pounds/in. ² |
|--------------------|---|------------------------------|

Speed

| | | |
|----------------------|---|----------------------|
| 1 metre per second | = | 3.28 feet per second |
| 1 metre per second | = | 2.24 miles per hour |
| 1 kilometre per hour | = | 0.62 mile per hour |

Temperature

$$^{\circ}\text{F} = (^{\circ}\text{C} \times 9/5) + 32$$

**Conversion tables –
imperial to metric (approximate)**

Length

| | | |
|--------|---|---------|
| 1 inch | = | 2.54 cm |
| 1 foot | = | 0.30 m |
| 1 yard | = | 0.91 m |
| 1 mile | = | 1.61 km |

Area

| | | |
|---------------|---|---------------------|
| 1 square foot | = | 0.09 m ² |
| 1 square yard | = | 0.84 m ² |
| 1 acre | = | 0.40 ha |

Volume (dry)

| | | |
|--------------|---|---------------------|
| 1 cubic yard | = | 0.76 m ³ |
| 1 bushel | = | 36.37 L |

Volume (liquid)

| | | |
|----------------------|---|----------|
| 1 fluid ounce (Imp.) | = | 28.41 mL |
| 1 pint (Imp.) | = | 0.57 L |
| 1 gallon (Imp.) | = | 4.55 L |
| 1 gallon (U.S.) | = | 3.79 L |

Weight

| | | |
|---------|---|------------|
| 1 ounce | = | 28.35 g |
| 1 pound | = | 453.6 g |
| 1 ton | = | 0.91 tonne |

Pressure

| | | |
|-------------------------|---|----------|
| 1 pound per square inch | = | 6.90 kPa |
|-------------------------|---|----------|

Temperature

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 5/9$$

Handy metric conversion factor (approximate)
litres per hectare \times 0.4 = litres per acre
kilograms per hectare \times 0.4 = kilograms per acre

Abbreviations

| | | | | | | | | |
|-----------------|---|----------------------|----------------|---|---------------------|-----|---|----------------------------|
| % | = | per cent (by weight) | F | = | flowable | mL | = | millilitre |
| ai | = | active ingredient | g | = | gram | mm | = | millimetre |
| AP | = | agricultural powder | Gr | = | granules, granular | m/s | = | metres per second |
| cm | = | centimetre | ha | = | hectare | SC | = | sprayable concentrate |
| cm ² | = | square centimetre | kg | = | kilogram | SP | = | soluble powder |
| DG | = | dispersible granular | km/h | = | kilometres per hour | t | = | tonne |
| DF | = | dry flowable | kPa | = | kilopascal | W | = | wettable (powder) |
| DP | = | dispersible powder | L | = | litre | WDG | = | water dispersible granular |
| E | = | emulsifiable | m | = | metre | WP | = | wettable powder |
| e.g. | = | for example | m ² | = | square metre | | | |

