Basic Knowledge Requirements to Become a Master Gardener in Ontario

including Sample questions

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Master Gardeners of Ontario Inc.

PART A - Introduction

Purpose

The purpose of this is to define the minimum knowledge required by Master Gardeners in Training (MGITs) as they complete their certification and become Master Gardeners (MGs).

Expectations

It is not the intent of this document to make sure all Master Gardeners know the same things. There is no need for all Master Gardeners to be identical in terms of what they know about gardening. In fact, this diversity is good for the organization. Master Gardeners across Ontario will have different experience and context because of their local climates and environments. But there is a minimum level of knowledge required for Master Gardeners to perform their roles effectively. It is expected that the questions on an Interim Exam would not be so specific that it could not accommodate this expected variation in the knowledge base of individual MGs. One MG might know roses intimately but only have a passing understanding of clematis while another might know clematis intimately but only have a passing knowledge of roses. In these days of being able to quickly research and ask advice this should be considered a strength of the organization rather than a weakness.

This document defines the level of knowledge required so that MGITs will know what to expect from the Certification Exam and so that those designing and marking the exam will have guidelines on what constitutes fair content. This is not meant as a training manual but as an outline of subjects that MGs should know along with the scope of knowledge for each of these subjects. It is expected that MGs will continually be updating and increasing their knowledge of gardening, but this is the minimum they should know before being released on their own to advise the public under the MGOI banner.

Reference Material

There are many reference books available for studying the material and it depends on the abilities and wishes of the individual to find the best fit. However, we would recommend using the Reference Manual for Ontario Master Gardeners, which can be found on the MGOI website, www.mgoi.ca.

Other sources of information:

1. The Internet.
2. Public, Group and University Libraries.
3. Research on Questions asked at clinics and on hotlines.
4. Trevor Cole's ***The New Ontario Gardener***
5. John L. Farrar's ***Trees in Canada***

Preparing for the Examination, some Self-Study Strategies:

1. Set aside a time each day to study or make a realistic study schedule. Perhaps it can only be three days a week. Then stick to it!

2. You may bring any number of written resources with you to the examination, for example, the Reference Manual mentioned on the previous page, a small plant name dictionary and other favourite resources

3. Know your reference material inside and out so that you can quickly refer to a page if you draw a blank on the test. Post-it notes are very helpful to quickly get you to a page. Do this for all resources you bring to the examination.

4. Take some time to do the sample questions (pg 14-26) following the strategies below. It will give you a good idea of what to expect on the examination day.

5. The examination consists of 100 questions that are worth 1 mark each; a 2 ½ hour time allotment is given to do the examination. Some questions are quite easy and some are more difficult. Divide 150 minutes by 100 and you have a minute and a half to do each question. Keep this in mind as you are preparing for the examination.

When Writing the Examination:

1. Take a few minutes at the beginning to quickly scan the whole paper. This helps to familiarize yourself with the content. It is time well spent.

2. Do all the questions that you know first, then go back and do the ones you need to look up.

3. Even though it is an open-book examination, there simply is not enough time to look up all the answers. Have confidence in the knowledge that you have. Make note of the answers you want to double-check and go back at the end of the examination, if you have time.

PART B - Guidelines

Basic plant form and function

- MGs should have an understanding of basic plant form and function with enough understanding of the terminology and concepts to allow reading and understanding of scientific information useful in solving practical gardening problems, but not necessarily enough to engage in the research themselves.
- They should have a practical understanding of the basic underlying anatomy, physiology and the environmental factors involved in plant growth, survival, and reproduction.
- They should be familiar with the common growth habits and reproductive strategies that plants employ.

Soils

- MGs need to know enough about soil structure and both biotic and abiotic soil processes so that they can advise on ways to rebuild and maintain healthy soils.
- They need to have a clear and practical understanding of methods of composting, mulching, and soil amending by both organic and chemical methods.
- Practical methods that homeowners can use for assessing and improving soil structure and health should be understood. This should include chemical fertilizers and their alternatives along with an understanding of how to apply them.
- MGs need to understand the concept and importance of pH.

Lawns

- MGs should understand how to maintain a healthy lawn by both chemical and alternative means.
- They should know when it is appropriate to replace or renovate the turf in a lawn and how to go about it.
- They should know about available non-chemical ways of maintaining lawns.
- They should also know how to identify the primary grass species employed, along with their uses. They should know how to identify and control the common weeds, insects and diseases of turf.
- They should also know about alternative ground covers.
- They should understand Integrated Pest Management (IPM) as it applies to lawns.

Plants for indoor use

- MGs should know how to maintain and propagate the commonly used houseplants.
- They should know how to identify and control the common pests and diseases of houseplants.

Arboriculture

- MGs should understand how to choose (based on site conditions), plant, prune and otherwise maintain trees in healthy conditions.
- They should be familiar with the common insects, diseases and disorders that affect trees and how to deal with them.
- They should have a clear understanding of how to diagnose tree problems.
- They should understand the differences between evergreen and deciduous trees and shrubs.
- They should be aware of trees native to their area.

Pruning

MGs should be aware of pruning methods for all common shrubs and trees including fruit trees, hedges and perennials.

Fruit, Vegetable and Herb Gardening

MGs should be familiar with the cultural practices of fruits, vegetables and herbs that might be grown in a small garden. This includes vines, shrubs and small fruit trees. MGs should,, with the aid of reference material, be able to diagnose and advise on treatment of damage due to pests and diseases.

Plant Identification and Cultural Practices

- MGs should be able to understand the seed propagation process and the importance of food, light and water to grow plants from seeds.
- MGs should understand the value of pinching and deadheading.
- MGs should be able to identify and explain the cultural practices for a majority of the common genera of perennials, shrubs, trees, vines, annuals, fruit trees, and vegetables.
- As a minimum, methods of propagation should be understood in general terms rather than in detail for each plant.
- Although MGs will know a great deal about varieties and cultivars, the specifics will vary with the individual MG and are not included because they can be looked up and the information is too vast for anyone to retain it all. While it is preferred that MGs know both common and scientific names, as a minimum requirement, either will suffice.
- It is difficult to define a common minimum requirement for the plants that an individual MG should know that would be consistent across the province. Of course there would be differences from one growing zone to another, but often MGs have to know about plants that grow outside their zones in order to advise people on the risks of growing them. MGs should understand the environmental requirements of perennials so that

they can advise where best to grow them. As a minimum, MGs should be familiar with common plants grown in their areas and their cultural practices. Appendix A contains a list of commonly used genera of perennials, shrubs, and trees grown in Ontario with their scientific and common names. Included also is a guide to pronouncing the scientific names.

Problem Solving

With the help of reference material, MGs should be able to identify, diagnose and advise on the control of insects, diseases, and disorders affecting plants. Appendix B contains a list of pests and diseases commonly encountered in Ontario.

Cultural and organic methods should be understood as well as chemical ones. Integrated Pest Management (IPM) should be understood in this context. Strategies for diagnosing problems should be understood.

Weeds

MGs should be familiar with the common weed types and their growth habits. MGs should be able to advise on effective strategies for the management and control of weeds. MGs should be knowledgeable about both organic and chemical means of control as well as IPM methods. MGs should also have an understanding of common invasive species and how to deal with them.

Ecological horticulture

MGs should have an understanding of the ecological topics of xeriscaping, plant succession, naturalizing, ecosystem interactions and relationships. MGs should have some knowledge of beneficial organisms, e.g. predators, parasitoids, beneficial nematodes, and competing/antagonist microorganisms. They should be aware of practices that encourage the presence of these beneficial organisms.

Policies and public relations

MGs should know about MGOI policies on dealing with the public and how to research and present horticultural information to the public. They should know the pesticide policy and any other policy that MGOI approves. Although MGs will not be examined specifically for it, they should be aware of MGOI's mission statement:

> *Master Gardeners of Ontario is a volunteer organization comprised of individuals who are certified horticultural experts and who provide in depth sustainable gardening information to the general public.*

Similarly, MGs should be aware that all Coordinators possess a handbook that contains information about the organization such as bylaws, policies, etc. They are encouraged to consult this document for information.

Landscape design

MGs will want to become versed in landscape design but as a minimum they only need to understand very basic design concepts. This should include how to analyze and approach a garden design.

PART C

Some Perennials, Trees & Shrubs Commonly Grown in Ontario

(These may not necessarily grow in all soil and climate conditions)

Matthiola math-ee-OH-lah	Stock
Rudbeckia rud-BEK-ee-ah	Black-eyed Susan
Cornus KOR-nus	Dogwood
Geranium jer-AY-nee-um	Hardy Geranium
Iberis eye-BEER-iss	Candytuft
Lychnis LIK-nis	Maltese cross
Salvia SAL-vee-ah	Salvia
Scabiosa skab-ee-OH-sah	Pincushion Flower
Sedum SEE-dum	Sedum
Saponaria sap-oh-NAR-ee-ah	Soapwort
Achillea ah-KILL-lee-ah	Yarrow
Aconitum ak-on-EYE-tum	Monkshood
Alchemilla al-kem-ILL-ah	Lady's Mantle
Anemone ah-NEM-oh-nee	Japanese Anemone
Anthemis an-THEME-iss	Marguerite Daisy
Aquilegia ak-will-EE-zsah	Columbine
Arabis *AYR-ah-biss*	Wall Rockcress
Armeria ar-MARE-ee-ah	Thrift
Artemisia ar-tem-EE-zsah	Artemisia
Aruncus ah-RUN-kus	Goat's Beard

Asclepias ah-SKLEE-pee-us	Butterfly Weed
Aster ASS-ter	Aster
Astilbe ah-STILL-bee	Astilbe
Bellis BELL-iss	English Daisy
Bergenia ber-GEN-ee-ah	Bergenia
Campanula kam-PAN-yew-lah	Bellflower
Cerastium sir-ASS-tee-um	Snow-in-summer
Chrysanthemum kris-AN-theh-mum	Chrysanthemum
Delphinium del-FIN-ee-um	Delphinium
Dianthus dy-ANN-thus	Pinks
Dicentra dy-SEN-trah	Bleeding Heart
Doronicum door-ON-ih-kum	Leopard’s bane
Echinacea eh-kih-NAY-shah	Coneflower
Erica eh-REE-kah	Heather
Euphorbia yew-FOR-bee-ah	Euphorbia
Filipendula fil-ih-PEND-yew-lah	Meadowsweet
Gaillardia gay-LARD-ee-ah	Blanket Flower
Geum JEE-um	Geum
Gypsophila jip-SOF-ih-lah	Baby's Breath

Hemerocallis hem-er-oh-KAL-iss	Daylily
Heuchera HEW-ker-ah	Coral Bells
Hosta HOSS-tah	Hosta
Iris EYE-riss	Iris
Leucanthemum lew-KAN-theh-mum	Shasta Daisy
Liatris lee-AT-tris	Blazing Star
Ligularia lig-yew-LAR-ee-ah	Ligularia
Lobelia lo-BEE-lee-ah	Cardinal Flower
Lupinus *Lew-PY-nus*	Lupine
Malva *MAL-vah*	Mallow
Monarda mo-NAR-dah	Bergamot
Nepeta NEP-eh-tah	Catmint
Paeonia pay-OH-nee-ah	Peony
Papaver pa-PAH-ver	Oriental Poppy
Penstemon PEN-steh-mon	Beard Tongue
Physostegia fy-so-STEE-jhah	False Dragonhead
Platycodon plat-ee-KOE-don	Balloon Flower
Phlox flox	Phlox
Polemonium Pol-ay-MOH-ni-um	Jacob's Ladder
Potentilla po-ten-TIL-ah	Pontentilla
Primula PRIM-yew-lah	Primrose

Pulmonaria pull-mon-AR-ee-ah	Lungwort
Pulsatilla pul-sah-TIL-lah	Pasque Flower
Smilacina smeh-la-SEE-nah	False Solomon's Seal
Stachys STAK-iss	Lamb's Ears
Aurinia *or-EE-ni-ah*	Basket-of-gold
Tanacetum tan-ah-SEE-tum	Tansy
Thalictrum thah-LIK-trum	Meadow Rue
Tiarella tee-ar-EL-lah	Foamflower
Verbascum ver-BASS-kum	Mullein
Veronica ver-ON-ih-kah	Speedwell
Viola vy-OH-lah	Pansy
Yucca YUK-ah	Yucca
Clematis KLEM-ah-tis	Clematis
Aubretia	False Rockcress
Arenaria	Sandwort
Vinca VIN-kah	Periwinkle
Sempervivum sem-per-VEE-vum	Hens and Chicks
Lamium LAY-mee-um	Dead Nettle
Thymus TY-mus	Thyme
Campsis KAMP-sis	Trumpet Vine
Humulus HUME-yew-luss	Hops

Shrubs

Amelanchier am-el-AN-keer	Serviceberry
Aralia ah-RAY-lee-ah	Aralia, angelica-tree
Caragana kare-ah-GAY-nah	Peashrub
Chaenomeles ke-NOM-eh-lez	Flowering Quince
Clethra KLETH-rah	Summersweet Clethra
Corydalis kor-ID-ah-liss	Corydalis
Cotinus koe-TY-nus	Smokebush
Cotoneaster kah-TONE-ee-ass-ter	Cotoneaster
Crataegus	Hawthorn
Deutzia *De-T-zee-ah*	Deutzia
Elaeagnus eh-leh-AHG-nus	Russian-olive
Euonymus yew-ON-ih-mus	Euonymus
Forsythia for-SITH-ee-ah	Forsythia
Fothergilla fah-ther-GILL-ah	Fothergilla
Hibiscus hy-BIS-kus	Rose-of-Sharon
Ilex EYE-leks	Holly

Kalmia KAL-mee-ah	Kalmia
Kolkwitzia kol-KWIT-zee-ah	Beauty Bush
Ligustrum lih-GUS-trum	Privet
Perovskia per-OV-skee-ah	Russian Sage
Philadelphus fil-ah-DEL-fus	Mock-Orange
Physocarpus fy-so-KAR-pus	Ninebark
Potentilla Po-ten-TIL-ah	Potentilla
Rhus rus	Sumac
Sambucus sam-BOO-kus	Elder
Sorbaria sor-BAH-ri-ah	False Spirea
Spirea spy-REE-ah	Spirea
Syringa sy-RIN-gah	Lilac
Vaccinium vak-SIN-ee-um	Blueberry
Viburnum vy-BURN-um	Wayfaring tree
Juniperus joo-NIP-er-us	Juniper
Hydrangea hy-DRAIN-jah	Hydrangea
Lonicera lon-ISS-er-ah	Honeysuckle

Trees

Acer AY-sir	Maple
Aesculus ESS-kew-lus	Horsechestnut
Betula BET-ew-lah	Birch
Corylus KOR-ih-lus	Hazel
Fagus FAH-gus	Beech
Fraxinus FRAKS-in-us	Ash
Ginkgo GINK-oh	Ginkgo
Gleditsia gled-IT-see-ah	Thornless Honeylocust
Juglans JOO-glans	Walnut
Larix LAIR-iks	Larch
Liquidambar lih-kwid-AM-bar	Sweetgum
Liriodendron Lir-oh-DEN-dron	Tulip Tree
Magnolia mag-NO-lee-ah	Magnolia

Malus MAH-lus	Crabapple
Prunus PREW-nus	Cherry, Plum, Almond
Quercus KWER-kus	Oak
Sorbus SOR-bus	Mountain Ash
Styrax STY-rax	Snowbell
Tilia *TIL-ee-ah*	Linden
Salix	Weeping Willow
Abies *A-bee-ez*	Fir
Chamaecyparis	False Cypress
Picea Py-SEE-ah	Spruce
Pinus PY-nus	Pine
Taxus TAX-us	Yew
Thuja THOO-yah	Cedar
Thujopsis Thu-YOP-sis	False Arborvitae
Tsuga SOO-gah	Hemlock

PART D

Some Insects, Pests and Diseases Commonly Encountered in Ontario

(Not all of these are harmful to plants in all circumstances)

INSECTS

Chewing and Boring Insects

COLEOPTERA: beetles and weevils

Bark Beetles, Asian Longhorn Beetle, Emerald Ash Borer, Black Vine Weevil, Strawberry Root Weevil, Lily Leaf Beetle, June Beetles and Chafers, Viburnum Beetles, Asparagus Beetle, Potato Beetle, Squash Vineborer, corn rootworm, cucumber beetles, sap beetles, curculio, Mexican bean beetle, flea beetles, spinach leaf miners, wireworms

DERMAPTERA: earwigs

DIPTERA: flies, gnats, midges, mosquitoes

Apple Maggots, seed corn maggots, root maggots, carrot rust fly

HYMENOPTERA: bees, ants, wasps, sawflies, horntails

Birch Leaf Miner, Rose Sawfly, leafcutter bees,

ISOPTERA: termites

LEPIDOPTERA: butterflies and moths

Tent Caterpillars, Tomato Hornworm, Leaf Rollers, Gypsy Moths, Cutworms, Iris Borers, Spruce Budworm, Fall Web Worms, Peach Tree Borers, Cabbage Worms, Parsleyworm (Swallowtail), Cabbage Loopers, Codling moths

ORTHOPTERA: crickets, praying mantis, grasshoppers

Sucking Insects

HEMIPTERA: stinkbug, plantbug, squash bug, boxelder bug

Spittle Bugs, Hairy Chinch Bugs

HOMOPTERA: scale, mealybugs, whiteflies, aphids, cicadas, leafhoppers

THYSANOPTERA: thrips

OTHER PESTS

Slugs and Snails, millipedes, nematodes, sowbugs & pillbugs, Rodents, Deer, Spider Mites (Acarina), Eriophyid mites

DISORDERS caused by abiotic factors

Leaf scorch, walnut injury, Salt injury, Herbicide damage, Winter damage, Nutrient deficiencies, blossom end rot

DISEASES

FUNGI:

Black Spot, Rose Wilt, Damping Off, Dutch Elm Disease, Powdery Mildew, Anthracnose, Verticillium wilt, Fusarium wilt, Hollyhock Rust, Apple Scab, Tar Spot on Maple, Cedar Apple Rust, Snow Mould, Black Knot, Fire Blight, bean rust, corn smut, white mold, Alternaria leaf spot, club root.

BACTERIA:

bacterial black rot, bacterial soft rot, Crown Gall

VIRUSES:

cucumber mosaic virus, rose mosaic

PART E

Sample Questions

NOTE: There are several versions of the Certification Exam, and each one has the same format. There are 100 questions each worth 1 mark.
The exam is made up of:

- multiple choice questions – pick the ONE best answer (such as # 1 on this page)
- T/F questions (such as in #8 on page 15, but each one is separate on the exam)
- matching questions - maximum number of things to be matched is 4 (such as #21 on page 19)
- short answer questions – candidate states answer in own words (such as #14 on page 16)

There are no part marks possible for multiple choice or T/F questions. Our marker gives part marks where deserved for matching and short answer questions
The questions on the exam are not grouped by type – it is a random sequence of multiple choice, T/F, matching and short answer questions.

1. The pH of soil is
   (a) acidic below 7, neutral at 7, alkaline above 7
   (b) alkaline below 7, neutral at 7, acidic above 7
   (c) not affected by acid rain or snow
   (d) only matters in zones warm enough to grow rhododendrons and azaleas

2. You wish to apply nitrogen at a rate of 1.5 kg per 100 M^2. The fertilizer that you have contains 15% nitrogen. How many kg of this fertilizer would be required to achieve the desired rate on 250 M^2?

3. Which of these practices will NOT lessen thatch problems?
   (a) correcting soil surface drainage
   (b) light, frequent topdressing of compost worked in with a rake
   (c) increasing the irrigation of the lawn
   (d) mechanical dethatching with a rake

4. If one wants to stop using bonemeal, a replacement would be
   (a) green manure crops of nitrogen-fixing legumes
   (b) rock phosphate or colloidal phosphate
   (c) muriate of potash
   (d) sulphur-coated urea

5. Besides N, P, K, fertilizers contain valuable micronutrients including:
   (a) perlite, vermiculite and sphagnum
   (b) boron, manganese and iron
   (c) strontium, chromate and cadmium
   (d) zinc, hydrogen and colloids

6. There is a soccer field with good grass, on a rich clay soil, and used by very many teams all summer. It needs levelling. Should it be rolled? Any comments?

7. Containers and planters on balconies often use perlite and vermiculite
   (a) to reduce the effect of wind
   (b) to provide buffering capacity for the fertilizers
   (c) to improve soil porosity and lighten the weight
   (d) to modify the winter microclimate, especially on high balconies

8. True or False?

   T F Dandelions are tap-rooted noxious weeds

   T F Grass that goes brown in summer is dead and must be reseeded

   T F Weed grasses spread by tillers, rhizomes and stolons; proper lawn grasses only by seeding

   T F Perennial ryegrass performs well in competition with weed grasses and broadleaved weeds

   T F If turf has endophytic fungi, it's a problem

   T F Perennial ryegrass is valuable on dry areas and easily eroded slopes

   T F White clover is beneficial to lawn grass because its roots add Potassium to the soil

   T F Under most conditions Kentucky Blue grass will have deeper roots if mowed at 5cm than at 2.5cm

9. Perennials suitable for some balcony and planter locations include
   (a) *Potentilla*, cranberry cotoneaster, and *Daphne*
   (b) marigolds, *Petunia* and *Portulaca*
   (c) morning glory, *Salvia* and violas
   (d) *Saponaria*, *Dianthus*, *Artemisia* and *Sedum* species

10. Trees and shrubs for large patio planters in Zone 5 should
    (a) have a layer of coarse rock at the bottom to hold more water
    (b) get extra fertilizer in late autumn
    (c) be chosen to be hardy in Zone 3 or 4 if possible
    (d) be chosen to be hardy in Zone 5b and 6a if possible

11. For naturalizing in the garden, which of these bulbs will not reliably spread and flower? (There may be more than one answer)
    (a) *Scilla*
    (b) *Gladiola*
    (c) daffodil
    (d) species tulips(eg. *Tulipa tarda*)
    (e) regular tulips
    (f) aconite

12. A gardener wants to know what could cause his houseplants to have sticky honeydew on them
    (a) aphid
    (b) mealybugs
    (c) whitefly
    (d) all of the above

13. *Dracena marginata* and *Ficus benjamina* are effective in removing these indoor air pollutants:
    (a) cadmium, arsenic and chromate
    (b) benzene, trichloroethylene and formaldehyde
    (c) copper, molybdenum and zinc

14. My indoor plants have been getting their regular water and fertilizer, but since about Christmas their leaves are yellowing, browning and falling off. What is the probable cause? Explain.

15. My most sheltered spot to try to grow rhododendrons, azaleas and heather is right up against the wall of my house. There is space and there is good soil. What do you think?

16. I fertilize my vegetables all summer and they do well but I was told to stop fertilizing trees and roses by July. Why?

17. What is one disadvantage of leaving stakes too long on a newly-planted tree?

18. Match the following botanical names with the common names. Fill in the correct letter from the second list into the space on the first list.

_____*Acer rubrum*
_____*Larix laricina*
_____*Juniperus virginiana*
_____*Prunus virginiana*
_____*Betula papyrifera*
_____*Salix pentandra*
_____*Picea pungens* var *glauca*
_____*Gleditsia triacanthos*
_____*Tilia americana*
_____*Fraxinus pennsylvanica*
_____*Vinca minor*
_____*Metasequoia glyptostroboides*

(a) Eastern red cedar
(b) False spirea
(c) Red maple
(d) Basswood
(e) Periwinkle
(f) Crimson King maple
(g) Tamarack
(h) Dawn Redwood
(i) Blue Colorado spruce
(j) Canoe or paper birch
(k) honeylocust
(l) Chokecherry
(m) Black locust
(n) willow
(o) Green ash

19. Match the following plants with their notable characteristics. Fill in the space in the first list with the correct letter from the second list.

_____Sea buckthorn
_____Native osier dogwood
_____Mountain ash
_____*Forsythia*
_____Mock orange
_____Russian olive
_____*Hydrangea*
_____Japanese tree lilac
_____Littleleaf linden
_____*Gingko biloba*
_____Peking cotoneaster

(a) Deciduous conifer
(b) Attractive silver leaves
(c) Old favourite grown for its fragrant white blooms
(d) Small yellow or creamy flowers in June
(e) Twigs have four corky wings
(f) Excellent as trimmed hedge
(g) Blood red twigs in winter
(h) Reddish berries for birds
(i) Lenticular bark, like cherry
(j) Lovely flowers when the buds are not killed above the snow line
(k) Very resistant to salt spray and tolerates sandy or poor soil
(l) Narrow columnar tree

20. Match the description to the houseplant pests. Fill in the space in each of the first list with the correct letter from the second list.

_____aphids
_____two-spotted spider mites
_____scale
_____whiteflies

(a) four-winged, look like tiny moths
(b) hard shelled, on the stems
(c) carriers of virus
(d) clog soil pores

21. Match the plant with its method of propagation. Fill in the space in each of the first list with the correct letter from the second list.

_____mints
_____mosses
_____poplar
_____yew

(a) aril
(b) catkins
(c) raceme
(d) stolons
(e) spores
(f) rhizomes
(g) panicles

22. Match the plant with the risk. Fill in the space in each of the first list with the correct letter from the second list.

_____Foxglove flowers
_____Rhubarb leaves
_____Fruit pits & seeds
_____*Poinsettia* bracts
_____green potatoes
_____*Dieffenbachia*

(a) not as dangerous as reputed
(b) solanins
(c) oxalates
(d) cyanide
(e) digitalis
(f) alkaloid

23. It is important that a landscaping plan be:
(a) permanent.
(b) to scale.
(c) coloured to show the value of perennial beds.
(d) legally registered with the appropriate municipality.

24. A low and soggy patch in a yard
(a) is a good place for moisture-lovers like ferns and turtlehead.
(b) must have tile drainage installed or high raised beds.
(c) is the result of a permeable subsoil layer.
(d) is the perfect place for a concrete pool.

25. Contour planting on slopes
    (a) improves succession planting.
    (b) works well with intercropping.
    (c) helps prevent soil erosion.
    (d) helps with pollination of corn crops.

26. Write the best answer from the second list into the blanks in the first list.
    _____cutworms
    _____onion maggots
    _____potato beetles
    _____sap beetles

    (a) overwinter in damaged produce not cleaned up last season
    (b) no cultural or chemical control
    (c) can be deterred by plantings of marigold or tansy
    (d) can be trapped with baits
    (e) visible eggs under the leaves, crush or destroy
    (f) in soil near the decapitated seedling

27. Which is the best choice to colonize and thus fill a bare spot in a city lot?
    (a) 'Bristol Ruby' *Weigela*
    (b) Preston lilac
    (c) Flowering almond, especially if grafted as a standard
    (d) Snowberry

28. *Miscanthus sinensis* is an ornamental grass that makes a grand statement in the garden. What kind of maintenance does it require to look its best?

29. The Canadian Plant hardiness Zone Map
    (a) is based on a variety of climate factors in addition to minimum winter temperature.
    (b) is based on the same principles as the USDA Zone Map so all you have to do is add one to the USDA Zone to get the Canadian zone.
    (c) is controlled by Canadian Laws requiring accuracy on the tagging of shrubs and trees.
    (d) indicates that the "a" part of any zone is warmer than the "b" part.

30. Shearing the tips of branches evenly
    (a) is the best method of shrub rejuvenation.
    (b) helps a tree recover from loss of roots during transplanting.
    (c) alleviates the production of chloroplasts in deciduous evergreens.
    (d) for hedge conifers such as cedar and yew, should be done early in the growing season and if necessary again before midsummer.

31. In pruning Mugho pines we usually have better results if
    (a) we shorten the candles while they are still green and soft.
    (b) we wait until the new growth is properly hardened off.
    (c) we use good anvil pruners.
    (d) we look for the branch collar ring.

32. Flowering shrubs should be pruned by
    (a) careful pruning of all branches into an even tidy shape.
    (b) removing old branches at 45 cm height to avoid damaging the rootstock.
    (c) keeping all the established inner branches intact and only removing the suckers around them.
    (d) removing some older growth annually and letting some new growth come along to replace it.

33. The branch ring or collar area
    (a) should be sprayed with tree paint immediately after being cut.
    (b) should be sprayed, but after having 24 hours to callus over.
    (c) contains cells which callus rapidly and naturally; if left intact and left alone, the tree can resist disease infection because of this.
    (d) should be preserved to help epicormic buds form.

34. Most tree roots are in the top one metre of soil, therefore
    (a) the subsoil conditions only matter for tap-rooted trees like oaks.
    (b) there is little to worry about if the subsoil below one metre is impervious.
    (c) that soil matters, but the subsoil should also be broken up to allow air, water and roots to penetrate.
    (d) water percolation rates matter only in summer droughts.

35. Which of the following is most dangerous to a tree:
    (a) if its heartwood contains no living cells?
    (b) if its sapwood conducts water and nutrients from its roots?
    (c) If its cambium layer is damaged by rabbits and lawnmowers?
    (d) If its phloem cells become part of its bark?

36. A gardener in Zone 6 planted a Blue Princess holly, in good soil, in a protected site with adequate moisture, five years ago. It looks lovely and produces lots of blossoms but no berries. What is the problem?

37. Which tree is not hardy in Zone 4 and farther north?
    (a) Balsam fir
    (b) Northern catalpa
    (c) *Hydrangea arborescens*
    (d) Schubert chokecherry

38. What are the disadvantages of each of these? Is any one of them of any value or use? Comments, please.
    (a) Siberian elms
    (b) Willows
    (c) Silver maple
    (d) Poplars

39. A crabapple tree had lovely flowers a few weeks ago but now its leaves are spotty and falling off. What should be done?
    (a) Make sure all the leaves are gathered in autumn.
    (b) Gather and destroy all the fallen leaves as they come; spray with sulphur.
    (c) Spray with the safe biocontrol Bt (*Bacillus thuringiensis*).
    (d) Check for cedar-apple rust galls on nearby cedars, destroy them.

40. What chemical is safe for a cottager to use on the weeds in his lake? What do you recommend?

41. You are short of time to get your weeding done. Some rows should get priority and some you put off. Circle the ones you could put off.
    (a) onions
    (b) summer squash
    (c) asparagus
    (d) winter squash

42. Crop rotation in the home garden
    (a) requires the study of plant families and a bit of planning.
    (b) is better done on a three or four year plan than a two year plan.
    (c) may be of more value long term for good soil than for disease and insect control.
    (d) all of the above

43. For all of these vegetable families, list three examples of each:
    e.g. Amaryllis (*Liliaceae*) -- chives, onions, garlic

    (a) Mustard (*Brassicaceae/Cruciferae*)

    _____ _____ _____

    (b) Gourd (*Cucurbitaceae*)

    _____ _____ _____

    (c) Pea (*Fabaceae/Leguminosae*)

    _____ _____ _____

    (d) Nightshade (*Solanaceae*)

    _____ _____ _____

44. Too much of this fertilizer can reduce the flowering and fruiting of plants:
    (a) Nitrogen
    (b) Potassium
    (c) Phosphorous

45. My potatoes had terrible scab last year. What can I do to prevent it?
    (a) Organic gardeners can solve the problem with trap crops and with plants that attract beneficial insects.
    (b) Avoid fresh manure, wood ash, lime; amend the soil for lower pH; move to different plot if possible.
    (c) Keep the plants properly hilled up while the tubers are forming.

46. Which plants do NOT need protection from frost on cold spring nights?
    (a) Tomatoes
    (b) Peppers
    (c) Eggplants
    (d) Carrots
    (e) Cucumber
    (f) Pumpkin
    (g) Beets
    (h) Parsnips

47. What would you recommend be done about black spot in a rose garden?

48. My summer phlox has white-grey fuzz on the leaves. What should I do?

49. A gardener has very misshapen roots on most of his carrots. What is the pertinent remedial practice for next year?
    (a) more careful fertilizer and watering
    (b) companion planting, crop rotation, and mulching
    (c) digging the soil more deeply, tilth improvement, and keeping the rows away from pathways.
    (d) checking for soil-borne nematodes

50. Which of these statements is NOT true of dwarf fruit trees?
    (a) dwarf trees have smaller fruit.
    (b) dwarf trees are influenced by the roots to which they are grafted.
    (c) dwarf trees are not as drought resistant or wind-firm as standard trees.
    (d) dwarf trees are easier to spray, prune and harvest.

51. In small gardens, fruits such as raspberries, currants and strawberries are more rewarding than big fruit trees because:
    (a) they grow in areas of poor drainage.
    (b) they grow in poor or sandy soil, or in shade.
    (c) they give good crops and often within a year or two of planting.
    (d) they don't need as much care as fruit trees.

52. Is there any fruit that can be grown in very damp ground?

53. Enter the correct letter from the second list into the blanks on the first list

_____*Mycorrhiza*
_____lenticels
_____honeydew
_____Leaf galls
_____Leaf scorch
_____water sprouts
_____bract
_____Blossom-end rot
_____Thrips
_____Fireblight
_____allelopathy
_____auxins
_____lignin

(e) unsightly but seldom life-threatening
(f) leaf-like or petal-like
(g) nodules on the roots of legumes
(h) beneficial fungi which help roots absorb certain nutrients
(j) cause ugly witches brooms
(k) divisions of a compound leaf
(l) supports the growth of sooty mould
(m) could be confused with winter injury or scab infection
(n) water stress, calcium deficiency
(o) releasing toxins to eliminate competing plants
(p) extra-vigorous growth after too severe pruning
(q) silver streaks, speckles, on leaves
(r) small grey hard scales on bark
(s) responsible for apical dominance
(t) contributes to the woody cell structure
(u) can look like bacterial or fungal disease, very crisp and dry feeling
(v) small elliptical pores of the bark

54. Match the name of the flower with a characteristic.

_____Virginia Bluebell
_____*Delphinium*
_____*Begonia*
_____*Hosta*
_____Daylily
_____Coral Bells
_____Lambs' Ears
_____*Nicotiana*
_____Yarrow
_____Pansies
_____*Clematis*
_____*Campanula*
_____*Monarda*

(a) keep the roots cool
(b) leaves that children love
(c) spring ephemeral, disappears
(d) thrives in hot dry places
(e) needs good soil and staking
(f) roots are tuberous or fibrous
(g) is a Geranium
(h) needs no staking
(i) susceptible to slug damage
(j) flowers open at night