

MODULE II • Introductory Horticulture Training

# Applied Watering, Soils & Fertilizers

Presented by  
Landscape Ontario's  
Garden Centre Sector Group



HORTICULTURAL TRADES ASSOCIATION  
[landscapeontario.com](https://landscapeontario.com)



# Introduction to Watering



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One popular way to tell if your plants need water is to stick your finger about an inch into the growing medium (ie. garden soil, potting mix)

- *If it feels dry, break out the watering can or hose.*
- *If you detect dampness, check back again in a day or two.*



[\(Charlotte Ekker Wiggins, 2018\)](#)

Apply water gradually to allow it to fully penetrate the soil without run-off.

*Water needs a moment to seep into the soil.*

*Most of the plants you sell are in containers, they generally need watering more frequently than if they were in the ground.*



[\(Watering a strawberry plant. n.d.\)](#)

- **Water evenly around the plant for a balanced well-developed root system.**
  - *Always watering at only one root point leads to one-sided root growth and thereby to poorer nutrient absorption in the soil.*
  - *Therefore, water around the plant and distribute water in the entire irrigation area.*



## Water the soil, not the leaves, when possible.

- Make sure the water is applied into the container and only at the soil whenever possible
- The frequency and amount of watering required is determined by various factors
  - Temperature
  - Wind
  - Container size
  - Plant type
  - Soil type
  - Plant health



(Garden Gate Magazine, n.d.)

# Watering Devices



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# Watering Hose



(W.carter, 2016)



(Garden hose and hose reel, n.d.)

## ***Leaking hose?***

- ***Ensure all hose ends have proper gaskets***
- ***Ensure connections are tightened***
- ***Avoid driving equipment over hoses***
- ***Hoses are also tripping hazards, follow your guidelines for use.***
- ***Learn how to unravel and roll up a hose properly***



[\(essortment, 2012\)](#)

## Leaking hose nozzle?

- Tighten hose fittings
- Check the gasket in the attachment

[\(Patricia J. Moore, 2021\)](#)



## Water Breakers

Various types of water breakers or devices may be used at the end of a hose to reduce pressure and permit a greater amount of water to be applied

*Watering Wand  
Breaker Nozzle*



## Hose end sprayer

[\(Lee Valley, n.d.\)](#)

[\(Hose end sprayer, n.d.\)](#)





# Introduction to Soils

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# Soil or Dirt - What is the difference?

In 1 teaspoon of healthy soil there are...

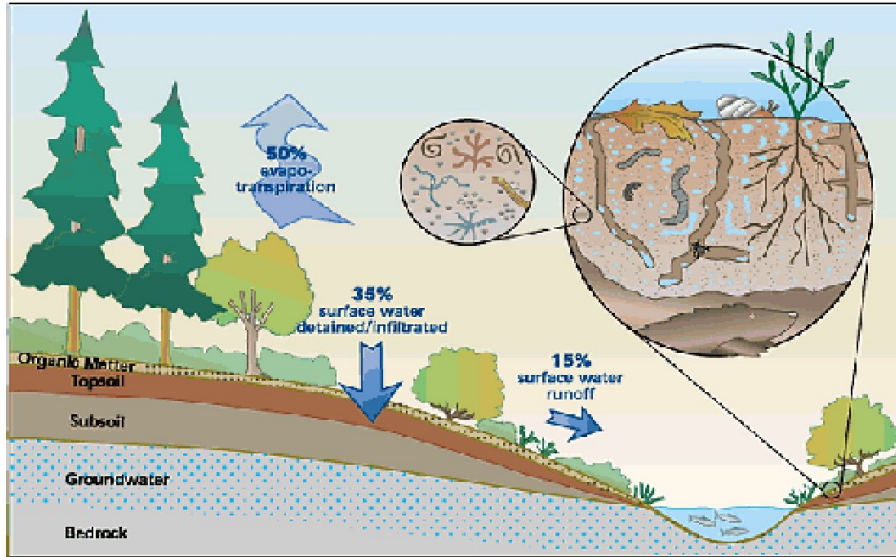
- **Bacteria** 100 million to 1 billion
- **Fungi** 6-9 ft fungal strands put end to end
- **Protozoa** Several thousand flagellates & amoeba  
One to several hundred ciliates
- **Nematodes** 10 to 20 bacterial feeders and a few fungal feeders
- **Arthropods** Up to 100
- **Earthworms** 5 or more



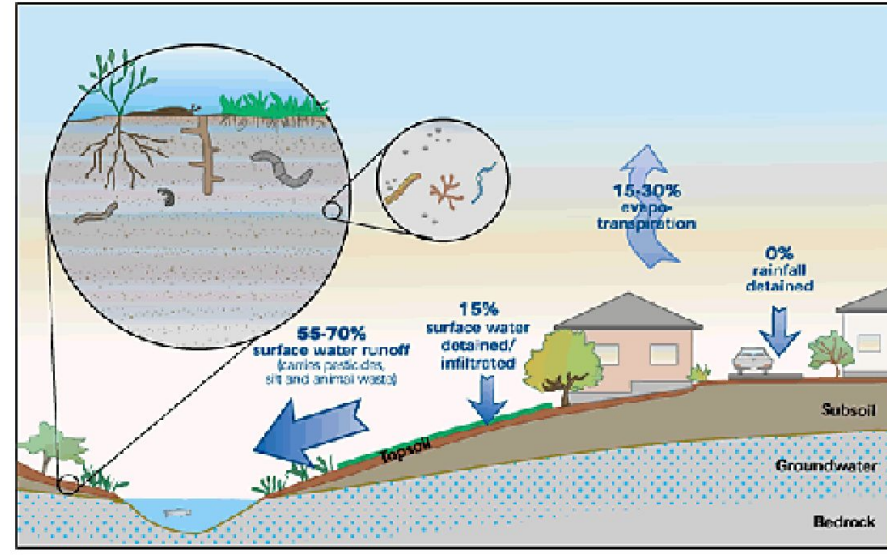
Travis & Gugino - PSU



# Native Soil VS. Disturbed / Non-Native Soil



**Native Soil**



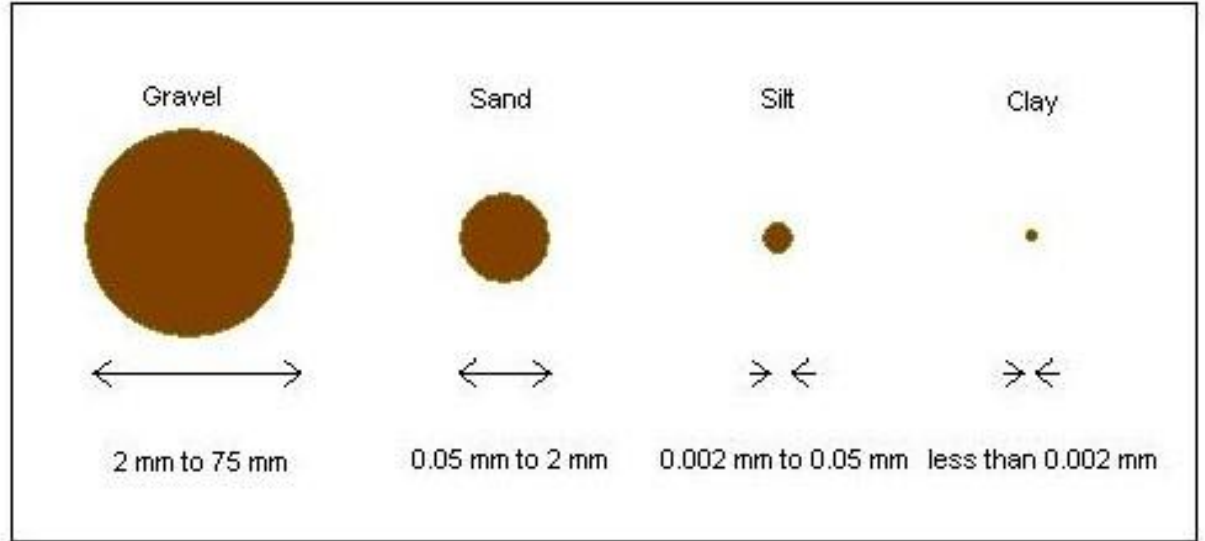
**Disturbed Soil**



# Soil Profile

- **O – (humus or organic)**  
Mostly organic matter such as decomposing leaves. May not be present in some soils
- **A - (topsoil)**  
Mostly minerals and some organic matter incorporated. Great place for plants and other organisms to live
- **B – (subsoil)**  
Rich in minerals that leached (moved down) from the A
- **C – (parent material)**  
The material from which the soil developed.

# Soil Particles



# Ideal Soil for Plants

## Right Plant, Right Place



# Soil Recommendations

- **Potting or Container Soils**  
Mostly organic matter such as decomposing organic matter. May have some degree of sterilization
- Generally more porous, lighter to use
- **A - (topsoil and soil mixes )**  
Mostly minerals and some organic matter incorporated. Great place for plants and other organisms to live

**Check with your employer  
Which is recommended for  
your area for**

- *Tree and shrub planting*
- *Growing in containers*
- *Vegetable gardens*

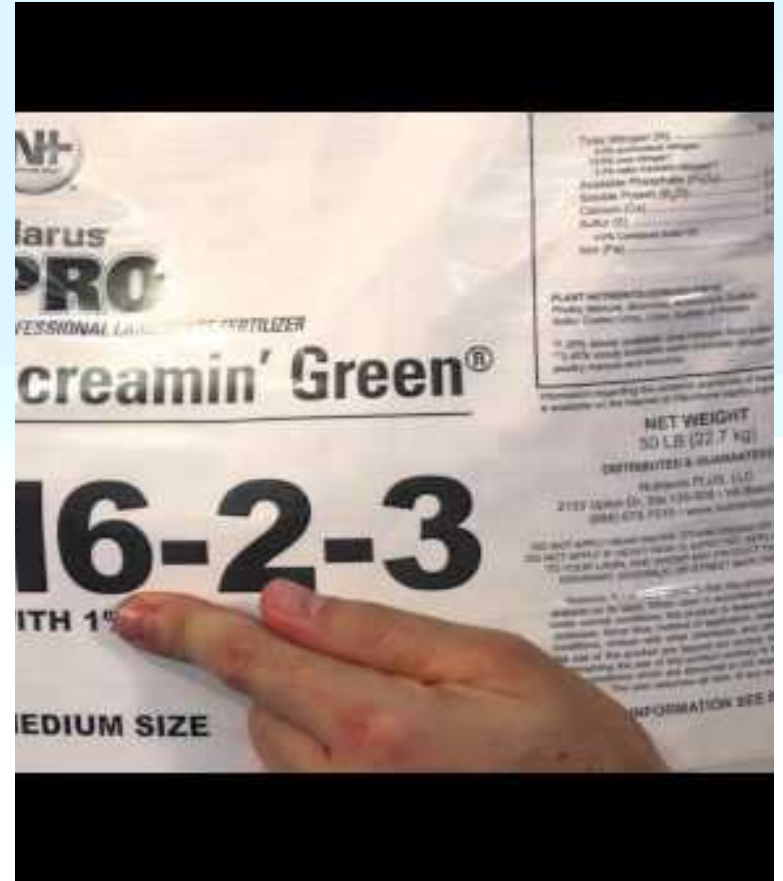
# Introduction to Fertilizers

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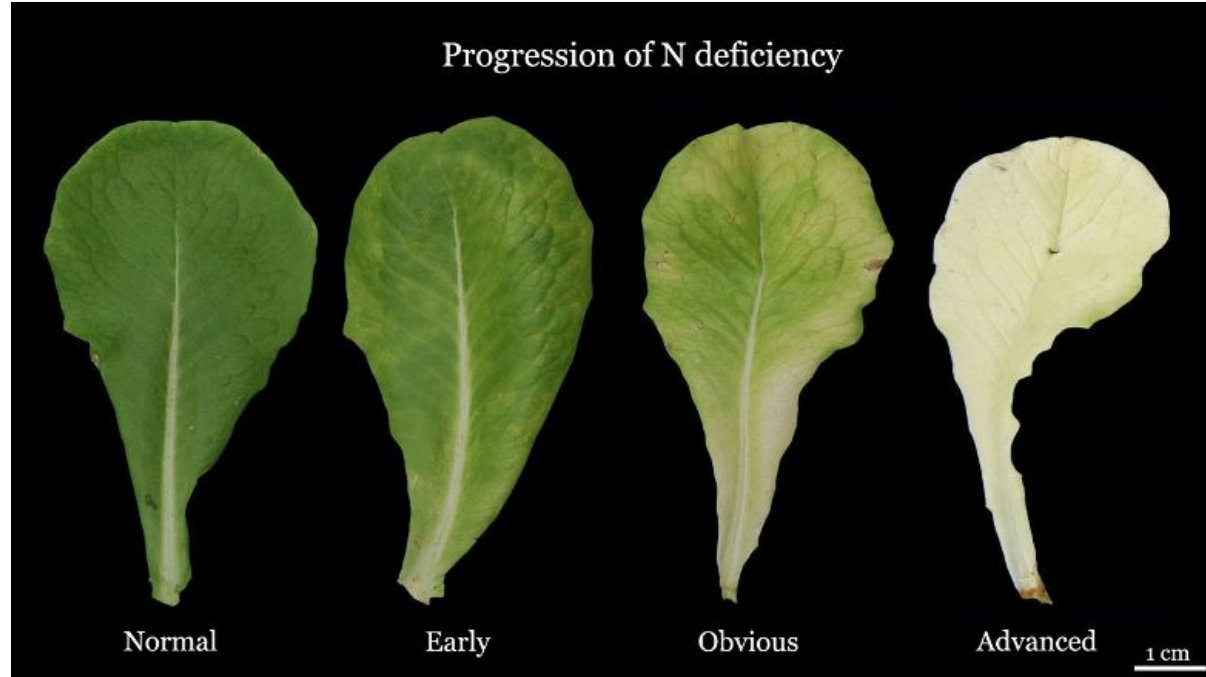


# Fertilizers

- Come in various forms
- Granular
- Liquid and liquid concentrate
- Water soluble
- Prills or sticks
- SPEAK TO YOUR EXPERTS



# N - Nitrogen



# N - Nitrogen





# P - Phosphorus



# K - Potassium



## What do the numbers on fertilizer mean?

The diagram illustrates the effects of three primary nutrients on plant growth stages. Each nutrient is represented by a vertical column with a plant illustration at the top, a soil layer, and a green box containing the nutrient name and its function. The Nitrogen column shows a seedling with two leaves, the Phosphorus column shows a seedling with four leaves and a root system, and the Potassium column shows a mature plant with six leaves and two yellow flowers. The soil layer is depicted as a layer of brown soil with small brown particles.

N	P	K
<b>NITROGEN</b> greens up plants JUST THINK: ↑ UP ↑	<b>PHOSPHORUS</b> reaches down to the roots and helps produce blooms ↓ DOWN ↓	<b>POTASSIUM</b> promotes all around wellbeing ← ALL AROUND →
<b>NITROGEN</b>	<b>PHOSPHORUS</b>	<b>POTASSIUM</b>

## Calculating amount of N-P-K in a fertilizer bag

### Example:

How many pounds of Nitrogen, Phosphorus, and Potassium are included in a 30 lb. bag of 10-10-10 fertilizer?

**10-10-10** => 10% N, 10% P, 10% K

**30 lb. x 10% = 30 lb x 0.10 = 3 lb. each of N, P and K**

# Micro Nutrients

- Calcium
- Iron
- Manganese
- Zinc
- Copper
- Boron
- Molybdenum
- Chlorine
- Magnesium
- Sulfur

## Organic vs. Synthetic (Inorganic)

### Organic fertilizers

Organic fertilizers-Organic fertilizer is all natural and includes things such as bat guano, compost, peat moss, wood ash and manure. These are general soil amendments. They don't burn or harm plants, and they can have long-term positive effects on the soil without damaging groundwater.



### Inorganic fertilizers

Inorganic fertilizers-Inorganic fertilizers are actually artificial or synthetic fertilizers. When plants are in dire need of nutrients because they are already dying, an inorganic fertilizer is the most immediate solution to infuse nutrients immediately to the plants.



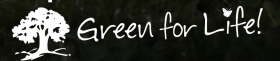
# Organic vs. Synthetic (Inorganic)



A person is watering a young tree in a garden. The person is holding a metal watering can and pouring water onto the soil around the tree. A wheelbarrow is visible in the background. The scene is set outdoors with various plants and trees in the background.

# Importance of Planting Trees & Plants

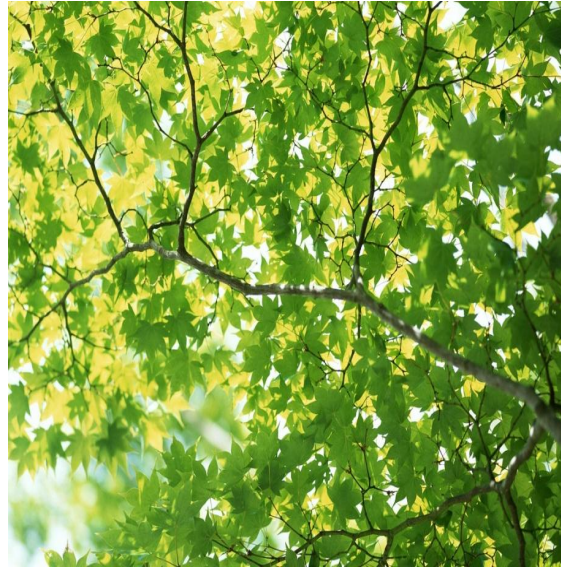
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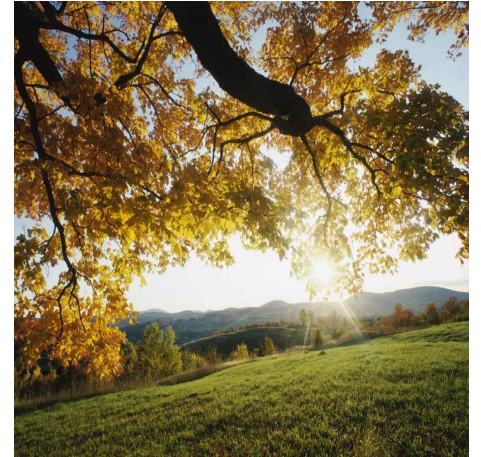


***Cleans the air... Absorb carbon dioxide and release oxygen***

***Provides food and habitats for birds, insects and animals***



- ***Reduces stress***
- ***Provides shade***
- ***Reduces noise, glare, and reflections***



# Increase property values by 10 to 20%



## **Saves energy on costs...**

Well placed tree(s) can reduce cooling costs up to 20%



A landscaped garden bed featuring a variety of plants including a central tree with long, thin, drooping branches, several smaller shrubs in different colors (green, yellow, red), and a modern, cylindrical light fixture with a white top and black bottom. The plants are arranged in a tiered fashion with grey stone retaining walls. The ground is covered with dark mulch and brown irrigation pipes.

# Right Plant for the Right Location

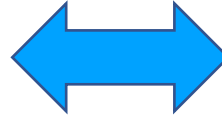
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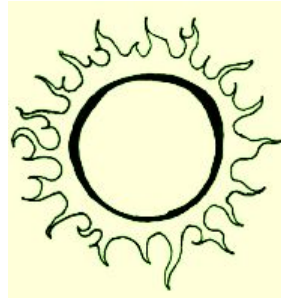
How tall?



How wide?



Sun or shade?



- Soil Type
- Water
- Wind
- Maintenance required
- Hardiness



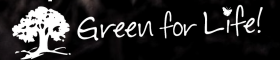






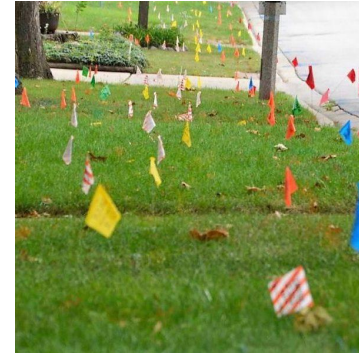
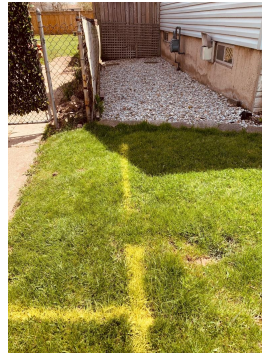
# Tree Planting Principals & Techniques

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# Call Before You Dig

- Need to locate underground utilities
- Free Service
- Takes 4-5 days

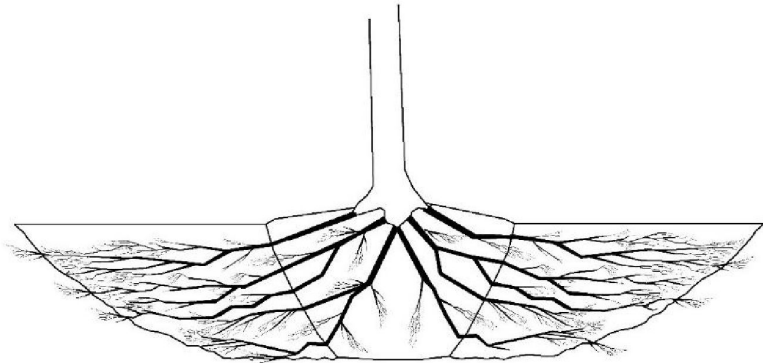




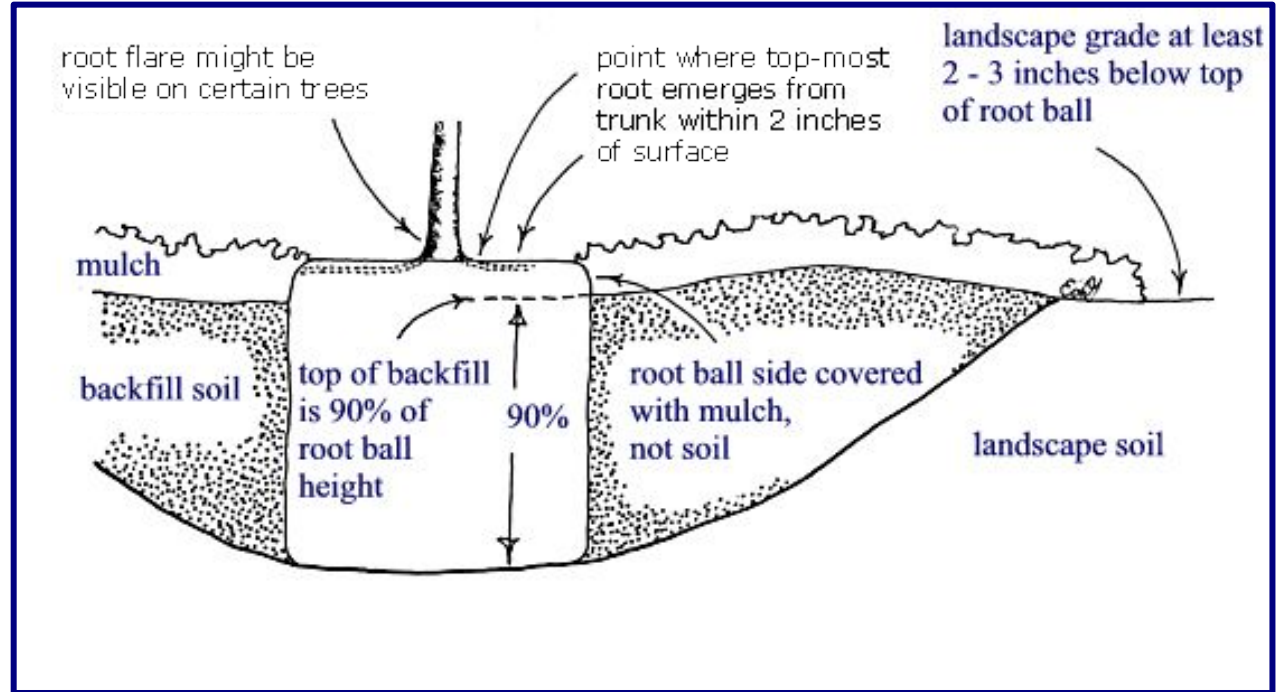
## Ontario Landscape Tree Planting Guide

- Released in 2019 by Landscape Ontario and Vineland Research and Innovative Centre
- Focuses on tree planting and establishment
- Intended for landscape architects, landscape designers, landscape contractors, urban forest managers, horticulturists, arborists, and other professionals who understand tree attributes and tree requirements and who have working knowledge of terms commonly used in the horticultural trades
- **Free Download:**  
<https://landscapeontario.com/ontario-landscape-tree-planting-guide>

Dig a shallow  
and wide hole.



Dig a shallow and wide hole.



Example:



## Girdling Roots



## Girdling Roots





## Tree placement in planting hole



## Tree placement in planting hole

*Straighten the tree*



## Establishment Care



# Next Steps:



MODULE I:

## Introduction to Botany

- Badge of Completion



MODULE II:

## Applied Watering, Soils & Fertilizer

- Badge of Completion



MODULE III:

## Turf Maintenance

*Presented by Landscape Ontario's  
Garden Centre Sector Group*

- **April 27, 2023**  
Start: 5:30 PM - 7:00 PM
- **Complete Online**



# Horticultural Technician 441C Apprenticeship Program

Red Seal Trade for Ontario's horticulture & landscaping profession.

## ***EARN WHILE YOU LEARN!***

80% of apprenticeship training happens on-the-job with your employer and the other 20% is completed in-school over two 12-week winter semesters.

[horticulturetechnician.ca](http://horticulturetechnician.ca)



# **GROW** Supervisory Training Program

*Free professional training, customized to help you achieve your goals.*

All participants receive:

- Advanced Workplace Health & Safety Compliance Training
- Supplemental Training Plan & Budget
  - Custom list of supplemental training opportunities goals;
- Exclusive online portal



All participants must be nominated by their employer.

[growtraining.ca/stp](https://growtraining.ca/stp)

# Upcoming Events

## Independent Garden Centre Training Module III: Turf Maintenance

April 27, 2023 / 5:30PM



*Connect to more training, workshops and  
events online.*

[www.horttrades.com/event](http://www.horttrades.com/event)