

LAWN CARE

People perceive organic gardening as new and difficult to learn. In reality before World War II it was the way most people gardened, there were herbicides and pesticides in existence, ones far more toxic than we allow now. For example both arsenic powder and nicotine powder were used to kill insects. Every generation prior to the 1950's knew what is now called organic gardening. The famous and ancient lawns and gardens in England, Europe and Asia existed century after century without the general use of herbicides and insecticides. In fact agronomists and scientists are now saying that the use of herbicides and insecticides increases the number and magnitude of the problems faced by crops (such as a lawn) because they treat the symptoms thereby allowing us to forget to remedy the causes. The causes to most plant diseases, infestations and weed problems are usually inadequate soil care and improper plant care. Hand weeding will be a part of the summer regime for an organic lawn but in return you will have healthier soil and more birds. In fact people who feed the birds also have natural earwig, beetle and grub control.

To develop a thriving 'organic' lawn where synthetic fertilizers and pesticides have been used one must overlap the two methods for one or two growing season so as to minimize the shock and improve the soil health.

Synthetic fertilizers release nitrogen in a readily available form to the plant quickly which causes:

1. Rapid bright green growth (succulent), succulent growth is very pretty but is also very easily attacked by insects and diseases.
2. Rainfall releases the nitrogen, some enters the soil and some runs off into the sewer system, potentially damaging the waterways it enters.
3. The rapid release of nitrogen kills micro-flora in the soil, (it is ionic causing the micro-flora to drain their fluids (plasmolysis) to the soil, resulting in death). Synthetic fertilizers decreased the microbe population in the soil by causing death and by starvation, they need organic matter as a food source.
4. The decreased number of soil organisms, decreases soil fertility.
5. Many soil micro-organisms are also small insect and disease predators so without them plants are more susceptible to widespread infestations. For example the soil fungus *Beauveria bassiana* infects and kills chinch bug.
6. Synthetic fertilizers do not add any organic matter to the soil. The micro-organisms which live in the soil need to consume organic matter to live. Organic matter makes the soil porous, allowing air and water to reach the roots, retains vast quantities of water, moderates soil temperature, retains and adds nutrients to the soil, feeds the micro-organisms that keep the soil fertile and healthy.

Schedule

Year 1

- April Lightly rake lawn with a fan rake, reseed dead patches and prune broken branches on bushes. Sharpen the lawn mower blades.
- May 15 - 30 Top dress with compost, screened top dressing soil or a mixture of compost, fireplace ashes (no more than 1 pound/ 100ft²), ground egg shells, coffee grinds, tea leaves, etc. Top dress after the soil has warmed up. In the spring water 2.5 cm (1") once a week, unless it has rained.
- June Mow the grass 7-8 cm (3") tall, because it is growing rapidly in the spring, and as a rule of thumb never cut more than 1/3 of a plant off at any given time. Apply the chemical fertilizer ½ strength. In the spring water once a week 2.5 cm (1"), unless it has rained. Watering in the morning will wash the air born moulds and fungi off the grass into the soil, and allows the grass to dry off before the dew settles. Watering in the morning insures that the lawn has moisture as the day becomes warm.
- July Water lightly during the heat of the day to cool the plants, reduce the soil temperature, and give the roots water when and where they most need it. Apply an organic fertilizer - it needs summer heat and organisms to decompose it so the nutrients won't be readily available to the plants for months.
- August Apply a 1/2 strength dose of fall lawn chemical fertilizer.
- September Water deeply (2.5 cm) once a week if it does not rain. Clean-up the flower beds, remove dying leaves because insects and diseases overwinter on debris. Empty the compost bin by raking it thinly over the lawn (topdressing again), throw the big bits into the flower beds, leave them on top or turn them under the soil.
- October Cut grass 7-8 cm (3"). The advice used to be to cut the lawn short for winter because the grass continues to grow all winter long but new research has found that this reduces the survival rate during a cold winter with insufficient snow cover. Do not cut the grass short before snowfall, the crowns of the plant are protected by the leaf blades that lay over them.

Year 2

- April Rake lawn and reseed dead patches. Sharpen the lawn mower blades.
- May 15 - 30 Top dress
Apply any synthetic fertilizer left over from the year before, ¼ strength
- June Apply organic fertilizer
- July - Oct Mow and water
Apply any synthetic fertilizer left over from the year before, ¼ strength, in late July.

Get to Know Your Lawn

Check these different factors over the course of the year.

Lawn Colour: bright green indicates fast growing succulent grass, it can be caused by high levels of nitrogen in the fertilizer or by over watering. Even though it looks nice it leaves the grass vulnerable to insects and diseases. Kentucky Blue grass goes a blue green colour when it is semi-dormant due to heat or drought. When Kentucky Blue grass is dormant the grass blades remain vertical and are tan coloured. Brown or patchy colours denote disease, insect damage or serious drought.

Soil Texture: soil should be crumbly and brown for optimum root growth. If it is clay it will be smooth and grey, if there is excess sand it will be so crumbly it falls apart and tan coloured. You can amend the soil by tilling in the needed organic matter or by top dressing and letting the worms till the soil. If you have very sandy soil add organic matter and some clay. If the soil is clay add organic matter to improve fertility.

Organic matter:

- makes the soil loose and porous
- increases water infiltration into the soil
- is a main source of nutrients as it breaks down
- humus has the highest capacity to hold nutrient ions, thereby increases soil fertility and productivity
- holds onto ions, hence stops leaching of nitrogen, etc into waterways.
- increases the amount of water a soil can hold and shares it with plants unlike clay (OM holds 4X its volume in water or 90% it's weight.)
- is food for soil micro-organisms
- is food for worms so the worm population increases
- worms aerate and till the soil, their castings are perfectly formulated fertilizer for plants
- a low population of 5 worms/ft³ produces 35 pounds of fertilizer in a 200 ft² garden

Aeration: If you have clay soil or heavily trafficked areas the most permanent form of aeration is to add organic matter. But to remedy the problem promptly, use an aerator to pull plugs out of the soil, rake up the plugs with a fan rake and compost them. Topdress the lawn with organic matter, compost, or rough sand to fill in the holes. Aeration should not be done in early spring because the soil is wet, and cold, wait until it has warmed up and dried out in late May or early June. In Ottawa, the optimum time for aerating would be in the fall because the grass grows quickly and the daytime temperatures are not too hot.

Soil Minerals Needed for Plant Growth

MINERAL	NITROGEN	PHOSPHATE	POTASSIUM	IRON	CALCIUM
Sources	Atmospheric N ₂ fixation by microbes and clay. Fish Emulsion Compost Manure Blood meal	Compost Wood ash Manure Rock Phosphate Bone meal	Compost Wood ash Manure Potash Bone meal	Compost Wood ash Blood meal	Rock Phosphate Bone meal Egg Shells Dolomite/lime
Benefits	Makes chlorophyll and leaves.	Promotes flower and fruit production. Needed for root growth and water uptake.	Makes sturdy stems and roots. Increases winter hardiness and disease resistance.	An essential component in chlorophyll. Young leaves go canary yellow, and eventually the twigs die back.	Essential for cell wall formation and cell growth. Inhibits soil borne pathogens. Reduces blossom end rot.

Water: In the spring and fall water each area deeply (2.5 cm or 1”) once a week, to promote deep roots. The roots will withstand dry periods better and bring nutrients from the subsoil up to the surface keeping the plants healthy. Water before lunch so the plants will be dry by night time because the dew brings mould spores down and they have a better chance of causing disease in damp lawns.

In the heat of summer water often (daily if it is over 35°C) during the hottest part of the day to reduce stress and soil temperature. Apply about an 1/8 “ when watering daily.

pH: It should be between 6.5 and 7.2 for a lawn made up of Kentucky Blue and Fescue. The soil pH should be tested if there is an unexplained problem. The soil pH affects the availability of nutrients; phosphorus, iron, manganese, copper and zinc become less available as soil pH exceeds pH 7, aluminium and iron are over abundant in acidic soil. All nutrients including nitrogen, phosphorous and potassium are most available at pH 6.5 - 7. It can be changed by top dressing. Rock phosphate, wood ashes from the fireplace, crushed eggshells, dolomite or lime raise the pH making the soil more alkaline. Compost, peat moss, manure, coffee grounds and tea leaves makes it less alkaline thereby lowering the pH.

Thatch: Thatch is a symptom of over fertilizing, over watering or too few soil micro-organisms. It is rarely a problem for homeowners. To check for thatch slice through the sod and measure the dense matted layer of straw coloured undecomposed grass clippings. If you have less than 1/2" (1.2 cm) rake in April or early May with a spring rake. If you have more than 1/2" (1.2 cm) topdressing with compost or screened topdressing soil is the best solution. The topdressing material will have the organisms that decompose the thatch. Worms love thatch so removing it with a blade for the lawn mower, reduces the number of worms in the soil. Dethatching

can scalp the high spots of the lawn and plants weed seeds causing more problems. Other means of treating the thatch include; using a verticutter to slice through the thatch and roots or applying Ringers lawn Rx which has micro-organisms that break down thatch.

Mowing the lawn often (once a week) and leaving short clippings returns the nutrients to the soil whereas long clippings must be removed. Lawn clippings from an untreated lawn can be used as mulch in the flower beds.

Remember that sharp lawnmower blades reduces disease problems for grass; clean cuts heal more quickly.

Mowing Heights: Grass should be 2" - 3" long to protect the growing crowns from sunburn, desiccation, chinch bugs and excess soil evaporation. Grass blades are the photosynthetic portions of the plant so when they are too short the plant cannot make adequate amounts of food for itself. When it is too short it needs more water and fertilizer but worst of all it is vastly more susceptible to disease and insect damage.

Top Dressing: Top dressing should be light, never applied more than 1/8 - 1/4 of an inch (3 - 6 mm) otherwise it will suffocate the grass. Top dressing at the end of May covers the chinch bug eggs and nymphs, suffocating them. It is a foolproof method of saving your lawn from the devastation these insects often cause, a lawn which is 30' X 35' (10 m X 12 m) needs approximately 1 cubic yard of soil, so if you order a 10 ton truckload you must organize a neighbourhood soil spreading party! Purchase screened topdressing soil, it is a fine mix of compost, soil and sand. Top dressing roots clover fabulously so remove it before top dressing if you don't like it.

Top dressing:

- replenishes the organic matter at the root zone without ripping out the grass.
- It changes the soil pH and adds nutrients to the soil.
- Mulches the lawn reducing heat and water stress.
- Can be used to control chinch bugs

If soil is used it may bring in weed seeds. It must also be opposite to existing soil so you top dress a clay lawn with a sandy organic soil or a organic/clay soil onto a sandy lawn area. When compost and manure are used they must be fine or shredded since they must go on just 1/4" deep at the most. Use only 1 pound of wood ash per 100 ft² per year, more than that will lower the pH of the soil. During the winter one can save the fireplace ashes, coffee grinds, tealeaves and washed and crushed eggshells in a metal garbage can. In the spring, mix it with compost, peat moss or old manure for top dressing the lawn.

Weeds: Weeds often have tap roots or very deep fibrous roots which makes them difficult to dig up but on the plus side it is this very trait which enables them to enrich nutrient poor soil. Typically the weed species prevalent in an area accumulate the very nutrient the soil is deficient of, for example knotweed, sorrel and plantain grow in acid soil but increase the calcium and magnesium in the soil. Mustard and shepherds purse grow in over mineralised acidic soil. They combine the salts into organic forms safe for other plants. Deadly nightshade, bittersweet, eggplant, jimsonweed, petunia, potato, snakeberry and tomatoes grow in soil exhausted by root crops (soils low in available potassium and calcium).

One method of weed control is to top dress with materials that will amend the soil. Raising the pH by adding the needed calcium and magnesium to the soil using crushed dolomite, lime, rock phosphate, bone meal, wood ash or eggshells makes the soil less hospitable for knotweed, sorrel and plantain. Treat the weeds as a symptom of a nutrient deficiency, add the nutrients to improve the soil for the desired plants.

Plantain is symptomatic of compacted soil, they usually grow along the edge of the driveway so topdressing with compost will bring the worms and decrease the compaction.

Weeds such as dandelions, plantain, thistle, crabgrass and quackgrass must be removed by hand. Dandelions must be removed in early May before they go to seed and crabgrass and plantain must be pulled out in early June, they are prostrate plants, with one crown and fibrous roots. Quackgrass is a fast spreading, and even faster growing coarse grass that propagates via rhizomes (white underground horizontal stems) so the complete root/rhizome system must be pulled out. Thistles grow in soils high in potassium so use compost to amend the soil. Pull out the complete root.

In patio areas boiling water, vinegar, borax or salt poured between the bricks kills the weeds. The vinegar lowers the pH so moss will grow, whereas borax and salt make the soil uninhabitable.

Insects:

Grubs

Two different species of white grub commonly attack lawns in the Ottawa area. They are the immature stage (larvae) of two different species of scarab beetle, the June Beetle and the European Chafer. Both species of grub are C-shaped, with soft, wrinkled white bodies, a brown or tan head and 6 brown spiny legs. They range in size from 3 mm when newly hatched, to 2 to 4 cm when full grown. Both species are found in the soil, feeding on the roots of grasses, weeds or almost any plant root material that they encounter, however the timing of biological events for each species differs, and this may affect how and when you act to manage these pests.

Fig. 1 Approximate Time for White Grub Feeding in Ottawa

Insect		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
June Beetle	Yr 1												
	Yr 2												
	Yr 3												
Chafer	Yr 1												

Healthy, vigorous lawns are better able to tolerate grub feeding

Parasitic nematodes are used to control white grub Nematodes are persistent in the soil for 60 to 90 days, so determine which species of grub is attacking your lawn, check its life history, and time the application of nematodes to coincide with the presence of larvae, ideally small ones. It is best to apply nematodes just after eggs have hatched if conditions are not too hot and dry.

Parasitic nematodes are microscopic worms and must be handled with care when being applied to lawns. Keep the nematodes in a cool place until you mix them in water, and apply them within 2 hours of mixing. Use a watering can hose-end or back-pack sprayer to apply them to the lawn soil. Nematodes must be applied to moist soil, that is at least 15°C. Thoroughly water the soil for more than an hour before applying

the nematodes. Do not expose the nematodes to light as this reduces their ability to kill white grubs. Apply the mixture, at dusk or on an overcast day to avoid exposure to light. Water the lawn area thoroughly after applying the nematodes, to wash them down from the grass surface into the soil.

Chinch bugs love hot dry sunny nutrient rich lawns, protected by the thatch layer. Chinch bugs overwinter on garden debris so clear up the leaves. They avoid feeding on endophyte enhanced grass cultivars. Top dressing the lawn in late spring prevents the eggs from hatching and may crush early instars. It also feeds the soil that the lawn is growing on, and helps speed up the decomposition of the thatch layer. Particular attention should be paid to the edges of the lawn near the garden bed, trees, etc. because they overwinter in these spots.

They are also inhibited by soaking the lawn with soapy water (use a hose end sprayer with soap in or it or household grey water) and by increasing the soil fertility. When organic fertilizers are used the soil develops a larger variety of micro-flora and fauna, some prey on chinch bugs.

Ants make the lawn lumpy as they aerate the soil, they also carry aphids around to plants, and they pollinate plants. Ants are valuable to the environment but can cause damage in a garden. You can discourage them by adding organic matter to the soil, and planting tansy, penny royal and spearmint. Ant colonies can be killed, by mixing 5 ml (1 teaspoon) of borax with 15 ml (1 tablespoon) of sugar. Place the mixture into a plastic container with a tight lid. Cut a hole in the side of the container for the ants to enter and leave by. They will carry the contaminated sugar back to the colony.

Diatomaceous earth sprinkled on the entrance will be brought back into the colony

Aphids A soap solution sprayed on aphids will kill them but it must be applied frequently until the whole colony is eradicated, make sure the insects are in contact with the soapy solution. You will see aphids first on new growth and under the leaves for aphids.

Home Made Insect Sprays: isopropyl alcohol and soap can be used to control soft bodied insects such as aphids and caterpillars. Isopropyl alcohol kills hard shelled insects such as earwigs. Soapy solutions should be washed off to reduce the chance of damaging the plant. Both soapy solutions and isopropyl alcohol kill beneficial insect they come in contact with. Test either solution on the plant first to ensure that damage won't occur.

Laundry water is safe for the lawn and has the benefit of killing the surface insects such as chinch bugs, it is neutralized by the soil.

Powdery mildew control One tablespoon of baking soda to a quart of water also controls mildew on plant leaves, if it is started before the symptoms show. Reapply after every rain. Bordeaux (Bordo) is a copper sulphate that controls powdery mildew even after the symptoms show.

Over seed in the fall . It introduces new genes into the turf which make the lawn more resistant to pests, diseases and climate change stresses.

