

RGA Gardening Fact Sheet #2: *Composting*

Gardening enhances our personal and community space. All plants, from trees to flowers, beautify our living area, provide edible food and offer environmental benefits ranging from the oxygen we breathe to creating summer shade to cool our homes. By growing plants, we better appreciate our natural environment and the ecological relationships between soil, water and climate. Gardening helps the young to the young-at-heart understand the responsible use and protection of our natural environment, as well as the impact we have on the "big picture" of environmental stewardship.

With support from the Conexus Credit Union's (CCU) Community Investment Program, the Regina Garden Associates (RGA) at the Regina Floral Conservatory aim to promote environmental stewardship through a series of gardening fact sheets, teaching appreciation of growing plants and basic gardening practices to the general public. Visit the Regina Floral Conservatory often and continue learning about gardening through our fact sheets.

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Composting in the Home Garden

Backyard composting improves your garden and makes a difference to the environment, avoiding transfer of garden waste to space-limited landfills. Gardeners can create compost to improve soil structure and fertility, reducing global impact associated with inorganic fertilizers and peat moss.

Composting is a natural, biological process of organic matter decomposing. Home gardeners can have a successful compost by monitoring (1) carbon and nitrogen in the plant material, (2) oxygen, (3) water, (4) temperature, (5) material volume, (6) material particle size and surface area and (7) bin size and site placement. Let's begin composting in our backyard!

Storage Bin and Placement

Wood or wood/wire bins are typically used with removable side boards providing access for mixing the compost. A minimum bin size of 3 ft. length x 3 ft. width and a maximum height of 5 ft. ensures sufficient compost volume. Limiting the height will prevent compaction and reduce effort required in turning the pile for adequate aeration. The original waste volume declines from 10-40% upon decomposition. Choose a sunny, well-drained location to aid warming the pile, which accelerates the decomposition rate and reduces the potential for soggy plant material.

Choice of Plant Materials to Compost

Practise the addition of small (5cm/2in. or less) pieces of raw material to your compost pile and mixing it well to hasten the decomposition process. Alternatively, you can layer (10-20cm/4-8in.) plant materials of similar texture and Carbon (C):Nitrogen (N) ratio (Table 1), such as a fine layer of moist green grass covered with a coarse brown layer of dry leaves with or without wood chips. By choice and size of raw materials, shredding, mixing, layering and controlling volume, the home gardener can create a compost bin with an ideal C:N ratio.

CONTACT US: 1450B Fourth Avenue
Regina SK S4P 3C8
306.781.4769
info@reginafloralconservatory.ca

VISIT US: 1450B Fourth Avenue, Regina

Our Pride in Bloom

www.reginafloralconservatory.ca





Source: flickr.com

Choice of Plant Materials to Compost (cont.)

In some cases, a compost pile needs an extra source of nitrogen to completely decompose. Compost accelerators are available at garden centres.

Appropriate Raw Material:

- Carbon (C)-rich dry brown materials: leaves, wood chips, saw dust
- Nitrogen (N)-rich fresh green material: grass, small branches, weeds, organic kitchen waste such as fruits and vegetables, coffee grounds

Inappropriate Material:

- Dairy, meat, plastic, pet/human excrement



Aeration, Temperature and Moisture

The rate of decomposition is more rapid when aerobic bacteria survive and prosper under compost bin conditions of:

- Oxygen or O_2 levels above 5 %
- Optimum compost temperature range $27^{\circ}C - 71^{\circ}C / 135^{\circ}F - 160^{\circ}F$
- Moisture levels of 40-60% or the equivalent of a rung out sponge



Source: amazon.com

The Art & Science of Your Compost Bin

Bacterial microorganisms consume carbon for energy, nitrogen for growth and reproduction, and produce heat. A successful compost pile needs a balance of two parts C-rich material to one part N-rich material. Too much C-rich material reduces heat production and decomposition slows. Too much N-rich material drops O_2 levels below 5%, resulting in anaerobic conditions and foul odors released from the compost.

The rate of decomposition within your compost pile is related to the heat it produces. Within the optimum temperature range, the rate of decomposition is highest between $40-60^{\circ}C$. Above $71^{\circ}C$ aerobic bacteria will not survive. Allowing the temperature to reach into the higher levels of the optimum range for short periods is important to kill pathogens and weed seeds. By monitoring compost temperature, gardeners can better judge to either turn over the compost, add water and/or add additional raw material. Compost thermometers monitor the progress of decomposition. Some compost thermometers measure both temperature and moisture level.



Use in the Home Garden

Compost is "finished" when the color is typically dark brown or greyish-black and texture is similar to topsoil with a crumbly feel. The smell is earthy and sweet. Larger lumps may have to be screened before use. In the garden, apply a layer 5 – 10 cm deep and mix into soil around annuals, perennials and shrubs. Compost improves soil structure and drainage, while adding nitrogen, phosphorus, potassium, calcium, magnesium, sulfur and micronutrients of iron, boron, manganese, copper, zinc and molybdenum. Compost may also be applied as a thin top dressing to lawns.