

LFS 350 Community-Based Experiential Learning Project

# Gardening Plan for South Vancouver Neighbourhood House

by University of British Columbia LFS 350 Team 23

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# Introduction

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This project aims to improve the quality of utilization of the currently underutilized garden. The rationale is to bridge the connection between people and their food, and also provide opportunity for increased interactions between staff members, volunteers and community members. This is done by having a gardening plan specially tailored to SVNH's needs.

**Through this plan, the community partner can teach and involve their volunteers and community members in gardening, with the underlying concept of food security as their end goal.** By providing a plan for better usage of the gardens, the community members will have an easier access to nutritious and affordable foods. They will also learn the knowledge of growing and maintaining of the gardens, which they can potentially bring home to start a garden by themselves.

## Why garden on rooftops?

- To make good use of otherwise unused and sterile space;
- To increase people's awareness and knowledge on agriculture, more specifically, on gardening;
- To create the opportunity for people to learn about food and nutrition;
- To bridge the connection between people and food;
- To foster a sense of community between members working on the rooftop garden; and
- To provide a collaborative leisure and learning activity for people from all walks of life (intergenerational and intercultural learning).

## What is the current situation of South Vancouver Neighbourhood Garden?

with input from SVNH's staffs, Tanya Findlater and Michelle Lu (October 4, 2014).

The SVNH's rooftop garden is currently managed by interested volunteers. Each department/program in SVNH is assigned to one garden box and it is up to the members within the departments to decide on the utility of the garden boxes.

The garden is in need of better maintenance and knowledge of what and how to grow. It is suspected that the soil quality, bacteria/viral infections and pest problems are affecting the quality of the produce from the rooftop garden.

Therefore, our goal is to help SVNH by creating a gardening plan which can serve as a guide to create a good gardening program, and through it, provide information on how to start and maintain the rooftop garden.

# 1. What to Grow?

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## 1.1 Companion Planting

Instead of having a monoculture garden, companion planting can reap many benefits. By using the knowledge of arranging symbiotic plants together in the garden, your garden can enjoy benefits such as pest reduction, increased yields and beautified space (Urquhart, 2013).

### Attract Beneficial Insects

- Some plants attract beneficial insects that help manage harmful insects and also pollinators (Iannotti, 2014).

### Repel Pests

- Some plants secrete chemicals from their roots, leaves and other parts that can help deter pests, and this can be beneficial to neighbouring plants that are more susceptible to the pests;
- This can help cut back the need to use chemical pesticides that are not as environmentally-friendly (Urquhart, 2013).

### Biodiversity

- Reduces the risk of having all crops fail due to weather, pests or disease in monoculture gardens (Urquhart, 2013).

### Maintain Appearance of Garden

- Having a diversity of plants can liven up the garden;
- And avoid having “bald spots” when certain crops were harvested/cut (Iannotti, 2014).

### Trap Crops

- A “sacrificial plant” can be grown to attract pests and divert them from the crops desired (Iannotti, 2014).
- This may not be applicable to SVNH as space is limited and we want to consider other options before sacrificing any produce.

We will be providing “what to grow with / what not to grow with” section for each plant that we recommend for SVNH below. For detailed information on companion planting, refer to West Coast Seed’s Companion Planting webpage:

<http://www.westcoastseeds.com/topicdetail/topic/companion-planting/> (2014).

## 1.2 Vegetables and Fruits

There is a wide range of vegetables and fruits we can grow in Vancouver. Below is a planting chart from West Coast Seed for your reference (West Coast Seed, 2013a):

### Vegetable Planting Chart for Coastal BC

Vegetables	LEGEND											
	WINTER			SPRING			SUMMER			FALL		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Artichoke	.....			**								
Asparagus		.....	.....	.....	.....	***						
Arugula			—————	—————	—————	—————	—————	—————	—————			
Broad beans		—————	—————	—————	—————	—————	—————	—————	—————	—————	—————	
Soya beans					—————	—————						
Beans bush & pole					—————	—————	—————	—————	—————			
Beets				—————	—————	—————	—————	—————				
Broccoli			.....	—————	—————	—————	—————	—————				
Broccoli overwinter						—————	—————	—————				
Brussels Sprouts					.....			**				
Cabbage			.....	—————	—————	—————	—————	—————				
Cabbage overwinter							—————	—————				
Carrots				—————	—————	—————	—————	—————				
Cauliflower			.....	**	.....	**	**					
Cauliflower overwinter							.....	**				
Celery/celeriac			.....	—————	—————	—————	**					
Corn						—————	—————					
Corn salad			—————	—————	—————	—————	—————	—————	—————			
Cucumbers					.....	—————						
Eggplant			.....			**	—————	—————				
Endive/Radicchio				—————	—————	—————	—————	—————				
Fennel		.....	.....	.....	.....	.....						
Garlic			—————	—————	—————	—————	—————	—————	—————	—————	—————	
Kale & Collards			—————	—————	—————	—————	—————	—————	—————	—————	—————	
Kohlrabi				—————	—————	—————	—————	—————				
Leeks		.....	.....	.....	.....	.....						
Lettuce			.....	—————	—————	—————	—————	—————	**			
Melon				..	****				**			
Onions sweet		.....		**								
Onions storage				—————	—————	—————	—————	—————				
Onions overwinter							—————	—————				
Onions scallions			—————	—————	—————	—————	—————	—————	—————	—————	—————	
Pac Choi		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Parsley		.....		—————	—————	—————	—————	—————				
Parsnips			—————	—————	—————	—————	—————	—————				
Peas		—————	—————	—————	—————	—————	—————	—————				
Peppers			.....			**						
Pumpkin				.....	—————	—————						
Radishes		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Rutabagas						—————	—————	—————				
Spinach			.....	—————	—————	—————	—————	—————	**			
Squash				.....	—————	—————	—————	—————				
Swiss chard				—————	—————	—————	—————	—————				
Tomatoes			.....	**	*							
Turnips				—————	—————	—————	—————	—————				

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**Recommendations for SVNH** – adapted from West Coast Seeds “How to Grow” (2013b)  
(with consideration for conditions specific to SVNH’s rooftop garden)

Plant	Growing Season	How to Plant?	To Grow With / Not to Grow With
<p><b>Tomatoes</b></p> <p>Tomatoes are rich in Vitamin C and beta-carotene.</p> <p>Recommended type: Red Robin (cherry tomatoes, bush type)</p>	<p>Indoors: Mid-March to early April, grow seedlings from 6-8 weeks.</p> <p>Transplant outdoors: May.</p> <p>Matures in 50-55 days</p> <p>Harvest: Fruit appears throughout July and August</p>	<p>Sow seeds 5mm-1cm deep, keep under bright light. Space transplants 45-60cm apart.</p> <p>Ideal pH: 6.0-6.8. Tomatoes like fertile, well-drained soil that is high in organic matter. Dig in finished compost and manure, and add 1 cup complete organic fertilizer beneath each transplant.</p> <p>Water regularly. Can consider using a tomato cage to prevent sprawling.</p> <p>Stop watering around the end of July to encourage the fruit to ripen.</p>	<p>Grow with asparagus, basil, beans, borage, carrots, celery, chives, collards, cucumber, garlic, lettuce, marigold, mint, nasturtium, onion, parsley and peppers.</p> <p>Do not grow with Brassicas, dill, corn, kohlrabi and potatoes.</p>
<p><b>Peppers</b></p> <p>Peppers are rich in Vitamin C when ripen (and Vitamin A for red ones)</p> <p>Recommended types: Gypsy Peppers, California Wonder Pepper</p>	<p>Indoors: Early March to first week of April.</p> <p>Transplant outdoors: Early June or later (when warm enough). Soil temperature at night should be more than 12 °C.</p> <p>Harvest: When fruit is ready to be picked.</p>	<p>Sow seeds 5mm-1cm deep, keep under bright light.</p> <p>At least three weeks before transplanting, add lime and compost (rich in phosphorus and calcium) to soil. Mix ½ cup of complete organic fertilizer beneath each plant.</p> <p>Good growth in moist soil.</p> <p>Space transplants 30-60cm apart.</p>	<p>Grow with asparagus, basil, carrots, cucumbers, eggplants, endive, oregano, parsley, rosemary, squash, Swiss chard and tomatoes.</p> <p>Do not grow with beans, Brassicas, and fennel.</p>
<p><b>Pole Beans</b></p> <p>Recommended type: Matilda</p>	<p>Direct sow: Mid-May to early July, soil temperature should be between 21-32°C.</p> <p>Harvest: There are always</p>	<p>Sow seeds 7-10cm apart and 3.5cm deep at the base of a support – which the plant will climb and twirl around.</p> <p>Ideal pH: 6.0-6.5. Use 1 cup of complete organic fertilizer for every row. Do not use too much nitrogen fertilizer as it can cause</p>	<p>Grow with Brassicas, carrots, celery, chard, corn, cucumbers, eggplants, peas, potatoes, radish and strawberries.</p> <p>Do not grow with</p>

	beans at different stages of maturity. Keep picking regularly so plants does not stop producing new pods.	poor pod set and delayed maturity.	chives, garlic, leeks, beets and onions.
<b>Garlic</b> Garlic can help repel whiteflies, Japanese beetles, root maggots, carrot rust fly and other pests, due to its sulphur compounds.	Direct sow: September to November.  Harvest (overwinter to form complete bulb): Following July to early August, when tops begin to dry and 50%-70% of the leaves turned yellow.	Plant cloves separated, with their skin, pointed and up, 10-15cm apart, with tip of the clove 2-5cm deep in soil. Plant deeper if heavy rain or frost is predicted.  Add compost before planting and fertilize when spring growth starts.  After harvesting, store in a cool, dry, well-ventilated space, and not in refrigerators because sprouting will be induced.	Grow with beets, Brassicas, celery, lettuce, potatoes, roses, strawberries and tomatoes.  Do not plant with peas and beans.
<b>Kale and Collards</b>  Kales and collards are rich in beta-carotene, Vitamin C and calcium. They are very easy to grow and cold-resistant.  Recommended type: Vates Blue Curled	Direct sow: March to mid-July for summer to winter harvests, in soil temperature range of 10-30°C.  Harvest: Cut when plants are 5-8cm tall and they can regrow.  Alternatively, leaves can be picked from bottom up on mature plants.	Sow 3-4 seeds 5mm deep and 45-60cm apart in rows 75-90cm apart.  Ideal pH: 6.0-6.8. Add lime three weeks before sowing. Water regularly.	Grow with chamomile, dill, mint, rosemary and sage.  Do not plant with eggplants, peppers, potatoes and tomatoes.

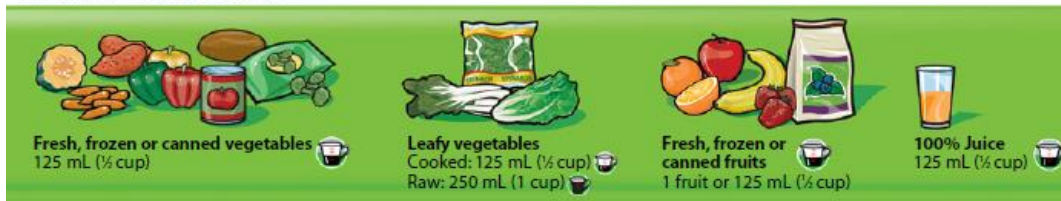


For your information, the following are screenshots of recommendations for vegetables and fruit intake by the Canada's Food Guide (2011):

**Recommended Number of Food Guide Servings per Day**

Age in Years Sex	Children			Teens		Adults			
	2-3	4-8	9-13	14-18		19-50		51+	
	Girls and Boys			Females	Males	Females	Males	Females	Males
<b>Vegetables and Fruit</b>	4	5	6	7	8	7-8	8-10	7	7

**What is One Food Guide Serving?**  
Look at the examples below.



## 1.2 Herbs

Herbs have many uses – for cooking, herbal drinks and medical purposes (Haynes, 2008; Nardozzi, 2014). Herbs are easy to grow, harvest and can be easily preserved for future use.

Similar to vegetables and fruits, different herbs are suited for different seasons. Herbs can be categorized to annual, perennial and biennial herbs (Nardozzi, 2014).

### Annual herbs (Day, n.d)

- Annual herbs live for only one year. They can be cut for consumption all summer, but die as soon as the cold weather comes. Therefore, annual herbs have to be harvested before the first frost.
- Examples: Basil, chervil, cumin and dill.

### Perennial herbs (Nardozzi, 2014)

- Perennial herbs live for a few years. Their leaves die in fall, but their roots allow them to resume growing in the following spring.
- Examples: Mint, rosemary, sage and thyme.

### Biennial herbs (Nardozzi, 2014)

- Biennial herbs live for two years, grow foliage the first season, overwintering, then forming seeds and ends life cycle at the end of second season.

Below is a planting chart from West Coast Seed for your reference (West Coast Seed, 2013c):

Herb Planting Chart for Coastal British Columbia

Herbs	Legend											
	WINTER			SPRING			SUMMER			FALL		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Basil				.....	—	**						
Bergamot		.....	—							—		
Borage		.....	—									
Catnip		.....	—					—	—			
Chamomile				—								
Chervil		.....	**	—				—	—	—		
Chives		.....	**	—				—	—			
Cilantro				—								
Dill				—								
Epazote				.....	**	**	**	**	**			
Fennel				—								
Florence Fennel		.....	—									
Lavender		.....	—		**	**	**			—		
Lemon Balm		.....	**	—								
Lovage		.....	—	**								
Marjoram		.....	—	**	**	**	—					
Mint		.....	—	**	**	**	—					
Oregano		.....	—	**	**	**	—					
Parsley				—			—					
Rosemary		.....	**	**	**	**	—					
Sage		.....	**	**	**	**	—					
Stevia				.....	**	**	**	**	**			
Summer savory		.....	**	**	—							
Thyme		.....	**	**	**	**	—					

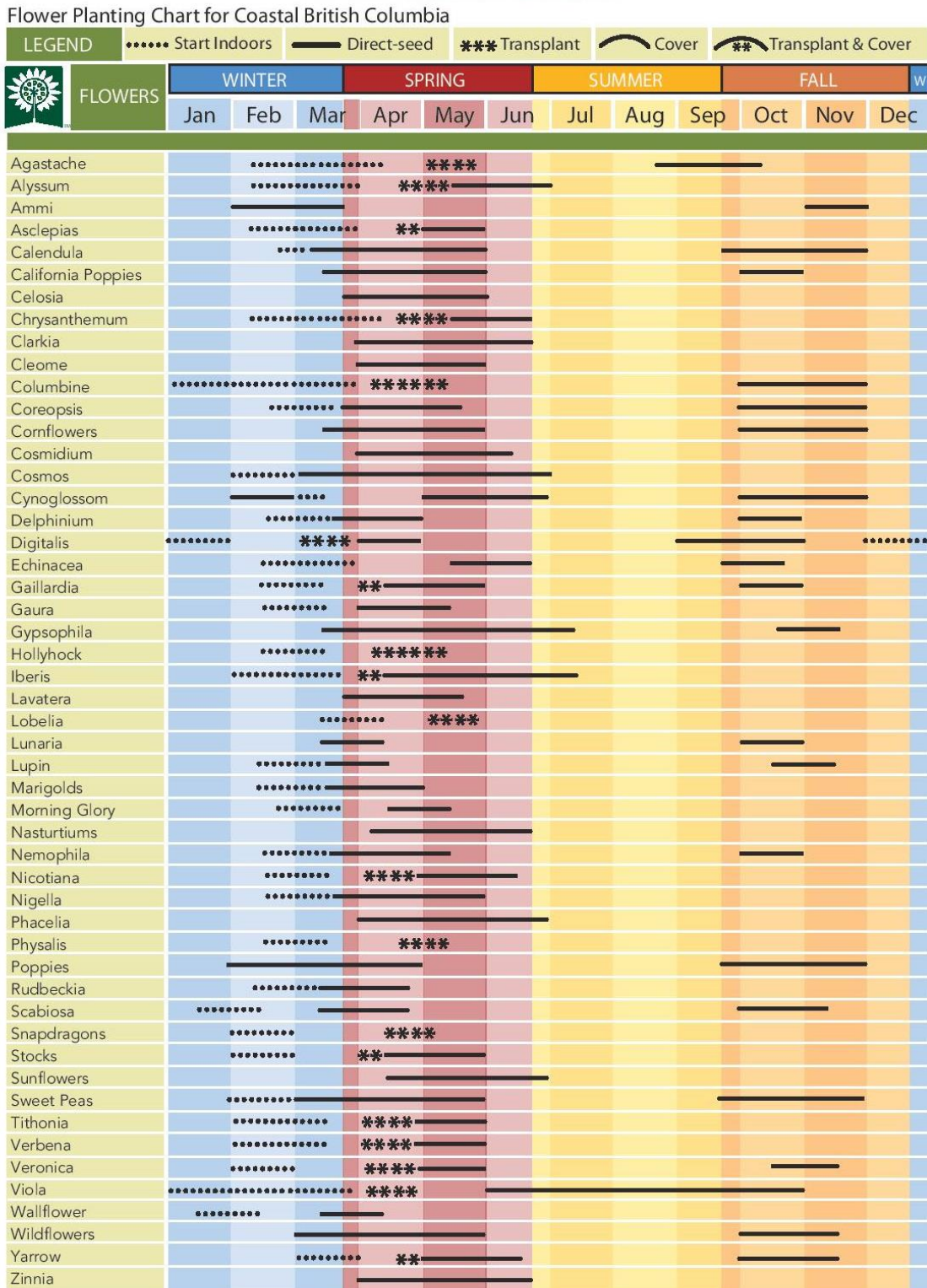
© 2013 Green Day Publications

**Recommendations for SVNH** – adapted from West Coast Seeds “How to Grow” (2013b)  
(with consideration for conditions specific to SVNH’s rooftop garden)

Plant	Growing Season	How to Plant?	What to Grow With / What not to Grow With
<p><b>Basil</b></p> <p>Aromatic leaves for cooking. Helps repel flies, mosquitoes and thrips.</p> <p>Recommended type: Dolly Basil</p>	<p>Indoors: Mid-April to mid-May Transplant in June</p> <p>Direct sow: Late May to early June, when soil is warm</p>	<p>Sow seeds 1cm deep in sterilized seed starting mix, and make sure they are adequately ventilated (avoid damp environment). Thin to 20-25cm apart.</p> <p>Once plants are 15cm (6") tall, pinch out the growing tips to encourage bushy growth. Pinch off flower buds too to promote more foliage.</p> <p>Harvest frequently to prolong plant life.</p> <p>Tear basil rather than chop with a knife.</p> <p>Basil is best fresh, but can be preserved by drying or by freezing.</p>	<p>Grow with asparagus, oregano, peppers and tomatoes.</p>
<p><b>Mint</b></p>	<p>Indoors: 8-10 weeks before last frost.</p> <p>Direct sow: April or May</p>	<p>Sow seeds 5mm and space them 45-60cm apart.</p> <p>Can be grown indoors in a small container over winter if it can be frequently exposed to sunlight.</p> <p>Leaves or branches can be clipped off whenever needed throughout the year, mint can regrow easily.</p> <p>The flowers are edible and can be used in salads and sweets.</p> <p>Mint is invasive, so it is better to confine it in containers.</p>	<p>Do not grow near parsley.</p> <p>Confine it in containers.</p>
<p><b>Dill</b></p> <p>Aromatic culinary herb. Flowers can attract beneficial insects to the garden.</p> <p>Recommended type: Ella Dill</p>	<p>Direct sow: May to August. (Stagger harvest by sowing every 2-3 weeks to get constant supply of dill).</p>	<p>Sow seeds 5mm deep in rows 45cm apart. Thin the plants to stand at least 15cm apart.</p> <p>Ideal pH: 5.0-7.0. Water and feed regularly, and stop any overhead watering once plants are 60cm tall to prevent issues with mildew forming on the leaves.</p> <p>Harvesting can begin when plants reach 15cm tall.</p>	<p>Grow with corn, cucumbers, lettuce and onions.</p> <p>Do not grow with carrots and tomatoes.</p>

### 1.3 Flowers

Below is a planting chart from West Coast Seed for your reference (West Coast Seed, 2013d):









## 2. Techniques

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### 2.1 How to Start?

#### 2.1.1 Tools

An essential factor for successful gardening is to choose the required tools properly. Here is some useful information about the types of the tools that can be used in the garden (BBC, 2014).

<p>Spade</p> 	<p>Spade is the most common and basic tools that are used for digging implement, to make holes inside the soil, and transfer soil or any other component from one place to another.</p>
<p>Fork</p> 	<p>Fork is used for digging soil that's stodgy, such as clay or full of stones; moving and spreading organize matter; and breaking down clods of soil.</p>
<p>Hoe</p> 	<p>Hoe is used for weeding by digging them out from their roots.</p>
<p>Rake</p> 	<p>Rake is used for final soil leveling and making a "tilth"- a fine, even soil surface for sowing/planting into. Also, used for taking leaves off the lawn, and even from gravel grounds.</p>
<p>Trowel</p> 	<p>Trowel is also used for weeding, planting small plants and tinkering with pots on the patio. Come in variety shapes, quality, and handlings.</p>
<p>Secateurs</p> 	<p>A basic tool for various purposes, such as pruning, cutting back, and trimming stems.</p>



<p>Watering tools</p>	<p>Come in variety designs that are suitable for different needs. For instance, spray guns, sprinklers, and hose nozzles are different types of watering tools, which comes in various different shapes.</p>
<p>Soil thermometer</p>  <p>(Linda, 2009).</p>	<p>To measure soil and compost temperature.</p>

## 2.1.2 How to Start Planting?

### Getting Started (Maniezzo, 2007)

- Loosen soil;
- Fill with topsoil;
- Add compost/organic matter to a depth of approximately 10-15cm, mix it with the top layer of soil and only start planting or sowing after two days.

### Sowing (planting seed by scattering it on or in the earth)

- Start sowing early in the season - early March for British Columbia (Maniezzo, 2007);
- There are two options:
  - Indoor seeding (The National Gardening Association et al., 2003)

By doing so, you “get a jump on the growing season”, and you can have seedlings ready for planting outdoor (transplanting) at the right time. However, there is a need to identify the suitability of the plant type for indoor seed sowing.

The plant should be able to tolerate root disturbance, i.e. root crops, such as beets and carrots, are NOT suitable for transplanting. Good plants for indoor seedlings are Brussel sprouts, cabbage, cauliflower, celery, eggplant, leeks, onions, peppers and tomatoes

**Transplanting** requires very special attention. There is a need to “harden off” seedlings before transplanting them outdoors, to prevent the seedlings from getting a physiological shock from the change in environment. To harden-off the seedlings, place them outdoors in shaded areas with indirect light for a few days. When a significantly lower temperature is predicted, bring the plants indoors overnight. The ideal method is to increase the plants exposure to sunlight and outdoor temperature gradually.

NOTE: Do not overharden your plants. Some crops, like cabbage and broccoli, are susceptible to bolting (flower before they are supposed to) if >3 weeks old seedlings are repeatedly exposed to temperatures below 4°C for two weeks.

During transplanting, cut slits down or tear the sides of the biodegradable peat pots (if you are using them) to allow for the roots to push through. Late afternoon is the best time for transplanting. If it is unavoidable to transplant them in a sunny day, shade the plants until sunset.

It is normal for plants to droop a little after transplanting – it will recover soon.

- Direct seeding

Before direct seeding, ensure that the soil is 1) dry enough; 2) has the right temperature. Different seeds have different requirements for soil temperature, hence, check the instructions at the back of the seed packet before seeding. You can determine the temperature of the soil with a soil thermometer (The National Gardening Association et al., 2003).

Space is an important consideration for rooftop gardening too. Choose plants with high yield that take up less space, e.g. tomatoes, peppers, lettuce and herbs (Germain et al., 2008). The spacing between the seeds can be found on the packets they come in.

After seedlings grow their second set of leaves, thin them out to avoid overcrowding by removing extra seedlings or transplant them to another part of the garden (The National Gardening Association et al., 2003).

### Companion Planting

Some plants benefit from being planted together with another plant, while some plants are not recommended to be planted together. See Section 1.1 “Companion Planting”.

## 2.2 Information on Soil

### Why does having adequate knowledge about soil important in gardening?

“Healthy soil is the key to successful organic gardening. The basic principle that organic gardeners live by is to feed the soil, and let the soil feed the plants” (Bradley *et al.*, 2009). Thus, it is in the gardener’s best interest to balance the soil as to provide all the conditions necessary for the plants’ growth. Optimal conditions of the soil will vary in pH and nutrient profile depending on what will be planted, so it is necessary to be informed about the specific requirements what is to be planted (West Coast Seeds, 2013e).

### Recommendations for SVNH

As the current SVNH’s soil status is unclear (T. Findlater, personal communication, September 29, 2014), we recommend that a soil test or a replacement in soil is to be performed.

#### Soil Testing

- Self-test by purchasing soil test kit, and with the aid of instruments such as compost the compost thermometer, digital moisture meters, and pH meters.
- Assistance from FreshRoots or West Coast Seeds.
- Send several soil samples to private companies for analysis.
- Once the soil has been tested for current conditions, amendments can be added to the soil in order nurture the it with essential nutrients such as nitrogen, calcium, magnesium, and iron as well as maintain a healthy pH level. Available products include:
  - Alfalfa meal
  - Blood and Fish bone meals
  - All purpose blends which usually combine several nutrients in appropriate concentrations.

#### Sources of New Soil (Jubenvill, 2011)

- Purchase soil from City of Vancouver (or possible no charge, see below);
  - City of Vancouver sells nutrient-rich compost soil produced from the yard and garden waste it collects from Vancouver homes;
  - Current rate: \$8.00 per cubic metre;
  - Delivery option offered for orders over 6 cubic metres (delivery charges apply) (City of Vancouver, 2014);
  - City of Vancouver provides garden compost donation to community-based project in Vancouver, requests are processed on a case by case basis;
  - Contact [greenstreets@vancouver.ca](mailto:greenstreets@vancouver.ca);



- Information available on: <http://vancouver.ca/home-property-development/donations-for-community-projects.aspx> (City of Vancouver, 2012).
- Homemade compost is also a great source essential nutrients for the plant and it is a very effective means of recycling nutrients that would otherwise be discarded as 'waste';
  - Information on how to compost and where to obtain the necessary supplies can be found through the South Vancouver municipality's composting program as well as by calling the City Farmer Compost Hotline at 604-736-2250 (West Coast Seeds, 2013).
- Purchase good garden blend at
  - The Home Depot;
  - UBC Shop in the Garden, etc.
  - Online at: <http://www.westcoastseeds.com/product/Gardening-Supplies/Soils-and-Amendments/#sthash.sQC8gEKR.dpbs>

### Sterilizing Garden Boxes

It is important to note that sterilization of the garden boxes prior to adding new soil is important! This is to prevent disease-causing organisms or mineral and salt from the existing soil from harming the new plants (Rindels, 1994).

- Steps (Beal, n.d.; Toronto Master Gardeners, 2012):
  - Remove all soil and plant fragments;
  - Soak all surface of the boxes with 10% chlorine bleach (one part chlorine bleach to nine parts water) in spray bottle;
  - Scrub containers with plastic dish scrubber and let them air-dry;
  - Make containers waterproof by brushing all surfaces with non-toxic, plant-safe waterproofing liquid and let them dry;
  - If the containers do not have drainage holes at the bottom already, drill ¼ inch diameter holes to drain excess water;
  - Line garden boxes with plastic, e.g. heavy duty plastic bags that the soil bought comes with, trim the plastic so that it reaches just the rim. Secure it by stapling it (if possible). Use a screwdriver or sharp stick to poke through the plastic at the drainage holes to allow water to drain;
  - To keep the drainage holes open, place a plastic or metal screen cloth at the bottom or put shards of broken flowerpot or any other suitable materials over the hole.

## 2.3 Information on Fertilizers

The use of fertilizers for growing plants in gardens is different from that in farms (Hatch, 1990). The recommendations below will be specific to gardening, as per the needs of SVNH's garden.

### What are fertilizers?

Appropriate amounts of minerals and water are essential for good plant growth. Soil pH level, temperature, organic matter content and microorganism activity are factors that can influence the availability of nutrients to plants (Hatch, 1990). Nitrogen, a nutrient that plays an important role in plants, is needed in the largest quantity and it is easily lost from the soil as the plant grows and through watering (Hatch, 1990; Nardozzi, 2009). Therefore, it has to be constantly added each year for good harvest, followed by the addition of phosphorus and potassium which are important for leaf, stem and root development (Hatch, 1990).

These nutrients that have to be periodically added to the soil to ensure the optimal growth of the plants are called fertilizers. The soil and plant types determine the type and amount of fertilizer to be applied (Nardozzi, 2009). If the soil type or status is unknown, a soil test is recommended to determine the type of fertilizer to use (Nardozzi, 2009).

Fertilizers can be stored for a long time and not deteriorate in quality if stored dry (Hatch, 1990).

### Types of Fertilizers

- Commercial fertilizers (Nardozzi, 2009):

Commercial fertilizers are often labelled with three numbers, e.g. 12-12-12, 4-12-0, and these numbers represents the ratio of nutrients in fertilizers.

The first number represents the ratio of nitrogen, the second number represents the ratio of phosphate, and the last number represents the ratio of potash.

- Organic fertilizers (Nardozzi, 2009):

Organic fertilizers provide organic matter to the soil. By doing so, the soil structure can be improved, helpful soil microbes can be fed and micronutrients are contributed. Some of them, such as manure and compost, are inexpensive and can be free.

However, as its release of nutrients is comparatively slowly than that of chemical fertilizers, it may not be the most ideal solution to a dire situation of inadequate nutrients in plants. Also, the nutrient content is usually lower than that of chemical fertilizers, therefore making organic fertilizers less efficient in that sense.

Examples of organic fertilizers: animal and green manure, blood meal, cottonseed meal, granite dust and rock phosphate.

- Chemical fertilizers (Nardozzi, 2009):

Chemical fertilizers are made artificially, and they can come in various forms - liquid, granular, powder or pellet. They are widely available, less expensive than most organic fertilizers and quick in release of nutrients. They are fast-acting, but potentially toxic and unable to provide nutrients for a long period of time.

They do not improve soil structure as with that of organic fertilizers, and some research suggests that they can harm the microbes in the soil. In addition, large amount of energy is required to produce chemical fertilizers, often with non-renewable sources.

- Compost: See “Organic fertilizers” and “Sources of new soil”.

By comparing the pros and cons for different types of fertilizers, we would recommend the use of organic fertilizers as they would be beneficial to the plant and soil health in the long run and minimize the damage on the environment. Chemical fertilizers can be used when a dire situation of malnutrition in plants arises.

### **Recommendations for SVNH**

For the purpose of the rooftop gardening project in SVNH, we recommend the use of an **Organic all-purpose blend**, with an approximate 4-4-4 ratio. Using an all-purpose blend minimizes the effort input, as even when it is not specific to a particular plant, it adequately fertilizes the plants most commonly used in small gardens. All-purpose blends usually include more than just nitrogen, phosphate, and potassium (in the form of potash), supplying the plants with other necessary micronutrients (West Coast Seeds, 2013). If however, more time and manpower were available, investing the time in researching plant-specific nutrient profiles would be advised in order to increase yields.

### **Over-dosage**

- Avoid overdosing plants with nitrogen and potassium as the build-up in salt concentration is very likely to harm the roots of the plants (Hatch, 1990);
- Also avoid applying excessive amount of phosphorous, as it can inhibit the uptake of iron, manganese and zinc.
- If plants are tall, thin and unproductive, it may be caused by excessive nitrogen. To counter this, reduce the frequency and amount of nitrogen fertilizers;
- If plants exhibits “burning” at the edge of their leaves, it is probable that there is a high salt concentration in the soil. To solve this problem, leach container with tap water at regular intervals (Hopkins, 2010).

Overall, an ideal mixture for the garden boxes will contain well-rotted compost/manure, rich garden soil that does not drain too quickly, and complete organic fertilizer. If growing vegetables, they usually respond well to being watered along with diluted liquid fertilizer. It is important to note that all fertilizers have specific directions for dilution and application, and it is important to follow these to avoid over-dosage.

## 2.4 Maintenance of Garden



Maintaining a garden requires a great deal of time and energy spent on taking care of the plants in the garden. Below are some tips on how to maintain a garden to keep it healthy and fruitful.





### Weeding

Weeds are plants that are out of place, most important is to know the type of plant before handling because some weeds are native species but can also be invasive (Forestry Facts, 2013). Invasive weeds compete with plants for water, nutrients, space and light. Therefore when weeding:

- It is important to remove all parts of weeds, including roots;
- Pull up weeds before they go to seed and self-spread around the garden;
- For deep rooted weeds like dandelions pull straight up with a little pressure on either side of the stem using a tool with small V-shaped end;
- For weeds with shallow invasive root systems, try scraping below the surface of the soil to drag out as much of the root system as possible; and
- It is easiest to pull weeds out when the soil is soft and slightly moist, such as after a good rain or deep watering (Trustees of Reservations, 2006).

### **Common Weeds found in BC Lower Mainland (BC Farms & Food, 2014).**

<p>Bindweed (Morning Glory)</p>  <p>(Gembara, 2014).</p>	<ul style="list-style-type: none"> <li>• The presence of bindweed indicates poor drainage, often hardpan soil with a crusty surface.</li> <li>• Bindweed grows in neglected areas and does not like cultivated soil.</li> <li>• The roots contain minerals which can be returned to the soil when composted.</li> </ul>
<p>Buttercup</p>  <p>(Simply Green Lawns, 2012).</p>	<ul style="list-style-type: none"> <li>• Buttercup survives in poorly drained cultivated garden soil</li> <li>• It produces a toxin called protanemonin which may suppress growth of adjacent plants.</li> </ul>

<p style="text-align: center;">Clover</p>  <p style="text-align: center;">(Simply Green Lawns, 2012).</p>	<ul style="list-style-type: none"> <li>• Indicates low fertility soil, low in nitrogen.</li> <li>• Like other legumes, clover obtains nitrogen from the air and fixes it into the soil when tilled under.</li> <li>• Clover can be planted as a cover crop.</li> </ul>
<p style="text-align: center;">Dandelion</p>  <p style="text-align: center;">(Simply Green Lawns, 2012).</p>	<ul style="list-style-type: none"> <li>• Found in heavy, clay, compacted acidic soil, but also grows in fertile well-drained soil.</li> <li>• Flowering dandelions provide early spring pollen that attracts ladybugs and other beneficial insects to the garden.</li> <li>• Edible. Dandelion leaves are sometimes used in salads. They are rich in beta carotene, vitamin C and vitamin A.</li> </ul>
<p style="text-align: center;">Dock</p>  <p style="text-align: center;">(Kiwicare, 2011).</p>	<ul style="list-style-type: none"> <li>• Indicates waterlogged, poorly drained soils with increasing acidity</li> <li>• Docks have deep roots that bring up calcium, potassium, phosphorus and iron, and help the soil structure.</li> </ul>
<p style="text-align: center;">Quack Grass</p>  <p style="text-align: center;"><small>Quackgrass is faster growing and lighter green in colour than desirable lawn grasses.</small></p> <p style="text-align: center;">(Weed Man, 2014).</p>	<ul style="list-style-type: none"> <li>• Grows in poorly drained, heavy clay soil or soil with a crusty surface.</li> <li>• Has a net-like root system that can help control erosion on steep banks.</li> </ul>

<p style="text-align: center;">Thistle</p>  <p>(Feasel's Home &amp; Garden Centre, 2013).</p>	<ul style="list-style-type: none"> <li>• Thistle is found in heavy, compacted soil.</li> <li>• Its deep roots help break up the subsoil and bring up iron and moisture for use by shallow-rooted plants.</li> </ul>
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### Watering

When watering plants there is no right or wrong rules, however the amount of water needed depends on the type of plant, the soil, the weather, time of year and various other environmental factors. The key to watering any plant is to water the “root zone” of the plant (Trustees of Reservations, 2006) so it can absorb the water most efficiently. Here are some efficient and effective ways to water plants:

- Focus on the root zone, the roots need access to water, not the leaves. Wetting the foliage is a waste of water and can promote the spread of disease;
- Slower watering is usually more effective to ensure that water gets to the root zone;
- Loose soil enables the proper air circulation to the root zone and can easily absorb water;
- Water only when needed. --- too much water can be just as damaging to plants as too little;
- Water in the morning. If you do get moisture on the leaves, this gives them time to dry out. It's much more difficult for plant diseases to get a foothold when the foliage is dry; and

When watering, soak the soil deeply. Avoid watering the soil to only a couple inches; plants will have difficulty developing deep roots if the only moisture available is on the surface of the soil. And, shallow watering will dry out more often, creating stress on the plants and wasting water (Gardener's Supply Company, 2014).



## 2.5 Plant Protection

Plant protection is one of the important things to be considered in gardening. Outdoor gardens have the potential to be influenced by heavy rain and strong wind. Therefore, appropriate protection should be done in order to prevent damage to the plants. Here are some ways to protect your garden:

- Raised beds (West Coast Seeds 2013f)
  - provides drainage;
  - temperature raises faster during sunny days in winter;
  - use as wind protection and act as greenhouse;
- Heavy row cover (West Coast Seeds 2013f)
  - retain heat;
  - prevent wind damage and provide pest control;
- Piling mulch on soil (McQuade 2011)
  - prevent direct exposure of soil or seed to the extreme weather;
  - maintain soil moisture.

Heavy row cover



(Graff, 2014).

Raised garden bed



(Hall, 2013).

### **Pest Control**

Use of pesticides can help increase productivity and plant yield (Wilson & Tisdell 2001). However, chemical pesticides can also damage the ecosystem and agricultural land of your garden (Wilson 2001). Therefore, before applying pesticides, you have to identify what organism is causing the damage to your plant and thus choose the right pesticide to use. Naturally occurring chemical such as nicotine, pyrethrum, and neem oil are comparably better pesticides

ingredients to apply (West Coast Seeds 2013g). Here are some examples of chemical pesticides can be used in organic gardens (Pottorff 2010):

- Pyrethrum - trade names as Pyrenon, Red Arrow and Pyrellin - is the most widely used insecticide in the US due to its low toxicity to human. it cause immediate knockdown on insects → labelled as caution
- Nicotine sulfate - trade name as Black Leaf 40 or Tender Leaf Plant Insect spray - is most toxic to warm-blooded animals and readily absorbed by skin but it breaks down rapidly. It can be used to control aphids, thrips and spider mites on vegetables and fruits → labelled as danger
- Sabadilla - trade name as Red Devil or Natural Guard - is the least toxic insecticides. It is very eye irritating and cause sneezing when breath in but does not leave residue because it breaks down quickly. It can be used against caterpillars, leafhoppers, thrips, stink bugs and squash bugs → labelled as caution
- Rotenone is used to control leaf-feeding caterpillars, beetles, aphids and thrips on different kinds of vegetables and fruits. It is moderately toxic to mammals but highly toxic to fish → labelled as caution

There are also some other ways to control pesticides using home remedies (Clayoquot Biosphere Trust 2011):

- Garlic oil spray
  - It can be used to prevent aphids, spider mites and whiteflies;
  - Use 10-15 cloves of minced garlic, 10 mL (2 tsp.) mineral oil, 600 mL (2 1/2 cups) water and 5 mL (1 tsp.) liquid dish soap;
  - Soak garlic in mineral oil for 24 hours. Take garlic out and add water and liquid dish soap. Mix thoroughly and spray plants with this solution.



# 3. Developing a Garden Program

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## 3.1 Collective Gardening

According to Germain, Gregoire, Hautecoeur, Avalon & Bergeron (2008), collective gardening is “a group of people garden together during regular gardening sessions”, as opposed to community gardening which involves the allocation of “gardening plots of equal size that are managed individually by a gardener or by a family”.

The benefits of collective gardening, as mentioned in the introduction, are that it can foster a sense of community and bring the members closer together through this combined effort.

The challenges of this type of gardening are the relative inflexibility in gardening time and the task allocation between different groups and members.

## 3.2 Getting a Sense of a Garden Program (adapted from Germain et al. (2008). *How to Start a Rooftop Garden*)

### 3.2.1 What Does a Year in the Garden Look Like?

#### January/February

- Recruit participants for gardening program;
  - Hold information session for interested volunteers;
  - Communicate about expectations and time commitment for program.
- Appoint one to two gardening coordinators for each gardening session, preferably members with substantial gardening experience and/or knowledge;
- Hold meetings to plan for upcoming season;
  - Brainstorming sessions on garden design, what to do with the harvest, scheduling of sessions, workshops and events on the calendar.
- Draft funding requests;
- Start preparing soil for planting (loosening of soil, adding organic matters).;
- Purchase seeds, seedlings, soil and fertilizers for spring planting.

#### March/April

- Begin spring planting (indoors, direct seedlings) – regular gardening sessions that will last until end of September;
- Training sessions and workshops for new gardeners.

#### May/June

- Transplant of indoor plants to outdoor;

- Maintenance: plant upkeep, fertilization and disease management;
- Purchase seeds and seedlings for summer planting;
- Continue with training sessions and workshops.

### **July/August**

- Begin with summer planting;
- Continuation of gardening sessions: plant upkeep, fertilization, disease management and harvest;
- Workshops and special activities. e.g. summer party, culinary workshops.

### **September/October**

- Harvest Festival;
- Harvesting;
- Close garden for the season.

### **November/December**

- Season review;
- Possible winter gardening.

## **3.2.2 What Does a Week in the Garden Look Like (Summer)?**

It is recommended to have three collective gardening sessions per week to respond to regular needs of the garden, 2-3 days apart. As the afternoons can get very hot, it is better for the sessions to be held in the morning or in the late afternoon, two to three hours per session.

Workshops on different gardening/cooking knowledge after gardening can be held weekly or biweekly.

## **3.2.3 What Does a Session in the Garden Look Like?**

### **Half an hour before start of session**

- Gardening coordinator arrives, survey the garden and prepare for the session;
- Read the gardening log and plan for tasks to be carried out in response to the immediate needs of garden;
- Write them down.

### **First hour to an hour and a half of session**

- Arrival of members, gardening coordinator to provide briefing;
- Start with watering;
- Begin on planting/harvesting;

- Sort harvest, and other gardeners to identify insects and diseases, to fertilize, and to transplant;
- Gardening coordinator to keep track of time.

#### **Half an hour before end of session**

- Clean tools and equipment;
- Gardening coordinator to facilitate debriefing;
- Group to share their experiences and reflections on the session, and to list tasks and activities that was not completed and have to be done in the next session;
- Group to also come up with new ideas;
- Write the important things discussed in the log book.

#### **Additional half an hour to an hour after end of session**

- Possible workshop/guest speaker on gardening knowledge;
- Interested volunteers to get together to discuss about special events for the rooftop garden.

### **3.3 Other Important Matters**

#### **Helpful tools for gardening sessions**

- Log book: This is to record down the progress of every session and inform the following session on what needs to be completed. This can also be a good platform for gardeners working in different days to share their experiences and ideas;
- Watering Map: A watering map can be put up for gardeners to check off which boxes they have done watering;
- Daily task board: A blackboard or whiteboard can be set up for the gardening coordinator to write down the tasks for the day.

#### **Weekly/Biweekly Email Updates**

- Gardening coordinators can take turns or collaborate to send weekly or biweekly email updates to members in the program to keep them up to date with the progress of the garden and new initiatives/events.

#### **Special Events**

- To increase enthusiasm, show appreciation to the members and increase other SVNH members' awareness on the rooftop garden, special events such as cooking sessions, market sale, harvest festival etc. can be organized every month or two, organized by interested participants.

## 4. Resources for Planting and Others

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Topic	URL
Gardening Resources (West Coast Seeds)	<a href="http://www.westcoastseeds.com/gardenresources/#sthash.5DSzjWFH.zgyonKmj.dpbs">http://www.westcoastseeds.com/gardenresources/#sthash.5DSzjWFH.zgyonKmj.dpbs</a>
Purchasing Soil/Getting Free Soil from City of Vancouver	<a href="http://vancouver.ca/home-property-development/donations-for-community-projects.aspx">http://vancouver.ca/home-property-development/donations-for-community-projects.aspx</a>
How to Grow (West Coast Seeds)	<a href="http://www.westcoastseeds.com/how-to-grow/">http://www.westcoastseeds.com/how-to-grow/</a>
How to Plant Vegetables (The Old Farmer's Almanac)	<a href="http://www.almanac.com/plants/type/vegetable">http://www.almanac.com/plants/type/vegetable</a>
Companion Planting (West Coast Seeds)	<a href="http://www.westcoastseeds.com/topicdetail/topic/companion-planting/">http://www.westcoastseeds.com/topicdetail/topic/companion-planting/</a>
Companion Planting (Urban Farm Online.com)	<a href="http://www.urbanfarmonline.com/urban-gardening/backyard-gardening/companion-planting.aspx">http://www.urbanfarmonline.com/urban-gardening/backyard-gardening/companion-planting.aspx</a>
Glossary (West Coast Seeds)	<a href="http://www.westcoastseeds.com/glossary/">http://www.westcoastseeds.com/glossary/</a>
How to Start a Rooftop Garden (The Rooftop Garden Project)	<a href="https://www.google.ca/url?sa=t&amp;rct=j&amp;q=&amp;esrc=s&amp;source=web&amp;cd=1&amp;cad=rja&amp;uact=8&amp;ved=0CB0QFjAA&amp;url=http%3A%2F%2Farchives.rooftopgardens.ca%2Ffiles%2Fhowto_EN_FINAL_lowres.pdf&amp;ei=i4VxVJWUGJCpogTd_oH4Cw&amp;usg=AFQjCNHcVa57KNZYkuUJoARz7Z4bs-gkpQ&amp;bvm=bv.80185997,d.cGU">https://www.google.ca/url?sa=t&amp;rct=j&amp;q=&amp;esrc=s&amp;source=web&amp;cd=1&amp;cad=rja&amp;uact=8&amp;ved=0CB0QFjAA&amp;url=http%3A%2F%2Farchives.rooftopgardens.ca%2Ffiles%2Fhowto_EN_FINAL_lowres.pdf&amp;ei=i4VxVJWUGJCpogTd_oH4Cw&amp;usg=AFQjCNHcVa57KNZYkuUJoARz7Z4bs-gkpQ&amp;bvm=bv.80185997,d.cGU</a>
Garden Planner – free for 1 <sup>st</sup> 30 days, \$25 annual fee (The Old Farmer's Almanac)	<a href="http://gardenplanner.almanac.com/">http://gardenplanner.almanac.com/</a>
Canada's Food Guide (version for educators and communicators)	<a href="http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/educ-comm/index-eng.php">http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/educ-comm/index-eng.php</a>

# References

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## **How to Start**

- BBC. (2014). *Tools*. Retrieved from <http://www.bbc.co.uk/gardening/htbg/module5/tools.shtml>
- Germain, A., Gregoire, B., Hautecoeur, I., Ayalon, R. & Bergeron, A. (2008). *Guide to Setting Up Your Own Edible Rooftop Garden*. Retrieved from the Alternatives and the Rooftop Gardens Project website [http://archives.rooftopgardens.ca/files/howto\\_EN\\_FINAL\\_lowres.pdf](http://archives.rooftopgardens.ca/files/howto_EN_FINAL_lowres.pdf)
- Linda, (2009). *Renewal!* [Photograph]. Retrieved Nov 24, 2014, from <http://www.klru.org/ctg/blog/?p=1674>
- Maniezzo, T. (2007). *Vegetable Gardening for Beginners*. Retrieved from UBC Botanical Garden website <http://www.botanicalgarden.ubc.ca/articles/vegetable-gardening-for-beginners>
- The National Gardening Association, Beckstrom, B., Cutler, K. D., Fisher, K., Giroux, P., Glattstein, J., ... Whitman, A. (2003). *Planting Vegetables from Seed and Seedling*. In *Gardening All-in-One for Dummies*. New York, NY: John Wiley & Sons, Inc.

## **What to Grow?**

- Albert, S. (2014). *Herbs for cool season growing*. Retrieved from <http://www.harvesttotable.com/2014/02/herbs-cool-season-growing/>
- Canadian Publications. (2011). *Eating well with canada's food guide*. Ottawa: Health Canada.
- Ck-12. (2014). *Seasonal changes in plants*. Retrieved from <http://www.ck12.org/life-science/Seasonal-Changes-in-Plants-in-Life-Science/lesson/Seasonal-Changes-in-Plants/>
- Day. (n.d). *Annual and Perennial Herbs for Your Garden*. Retrieved from <http://www.todayshomeowner.com/annual-and-perennial-herbs-for-your-garden/>
- Haynes, C. (2008). *Culinary herbs in the garden*. Retrieved from <http://www.extension.iastate.edu/news/2008/aug/060101.htm>
- Iannotti, M. (2014). *Interplanting Flowers and Herbs in the Vegetable Garden*. Retrieved from <http://gardening.about.com/od/organicgardening/qt/Interplanting.htm>
- Nardoizzi, C. (2014). *Herbs gardening basics 101*. Retrieved from National Gardening Association website <http://www.garden.org/ediblelandscaping/?page=herb-gardening>
- Urquhart, K. M. (2013). *Companion Planting*. Retrieved from <http://www.urbanfarmonline.com/urban-gardening/backyard-gardening/companion-planting.aspx>

- West Coast Seeds. (2014). *Companion Planting*. Retrieved from <http://www.westcoastseeds.com/topicdetail/topic/companion-planting/>
- West Coast Seeds. (2013a). *Vegetable Planting Chart for Coastal BC*. Retrieved from <http://www.westcoastseeds.com/admin/files/planting-chart-CATALOGUE-adjusted3.pdf>
- West Coast Seeds. (2013b). *How to Grow*. Retrieved from <http://www.westcoastseeds.com/how-to-grow/>
- West Coast Seeds. (2013c). *Herb Planting Chart for Coastal BC*. Retrieved from [http://www.westcoastseeds.com/admin/files/planting-chart-HERBS%202014\\_1.pdf](http://www.westcoastseeds.com/admin/files/planting-chart-HERBS%202014_1.pdf)
- West Coast Seeds. (2013d). *Flower Planting Chart for Coastal BC*. Retrieved from [http://www.westcoastseeds.com/admin/files/planting-chart-FLOWERS%202014\\_1.pdf](http://www.westcoastseeds.com/admin/files/planting-chart-FLOWERS%202014_1.pdf)

### **Soil and Fertilizers**

- Beal, J. (n.d.). *How to Get Wooden Planters Ready for Planting*. Retrieved from Home Guides website <http://homeguides.sfgate.com/wooden-planters-ready-planting-21601.html>
- Bradley, F. M., Barbara W. E., & Phillips, E. (2009). *Rodale's Ultimate Encyclopedia of Organic Gardening: The Indispensable Green Resource for Every Gardener*. New York, NY: Rodale, Print.
- City of Vancouver. (2012). *Free Compost for Community Gardens*. Retrieved from <http://vancouver.ca/home-property-development/donations-for-community-projects.aspx>
- City of Vancouver. (2014). *Buy Compost Soil for Your Garden*. Retrieved from <http://vancouver.ca/home-property-development/compost-soil.aspx>
- Hatch, D. (1990). *Fertilizing for a Successful Garden*. [factsheet]. Utah State University Extension, U.S.A.
- Hopkins, K. (2010). *Common Problems in Container Gardens*. Retrieved from University of Maine website <http://umaine.edu/publications/2765e/>
- Jubenwill, E. (2011). *Gardening 101: Start Up Your Own Personal Garden This Spring*. Retrieved from <http://www.bcliving.ca/garden/gardening-101-start-up-your-own-personal-garden-this-spring>
- Nardoizzi, C. (2009). Choosing a Fertilizer for Your Vegetable Garden. In *Vegetable Gardening for Dummies (2nd ed.)*. New York, NY: John Wiley & Sons, Inc.
- Rindells, S. (1994). Cleaning and Disinfecting Plant Containers. *Iowa State University IC*, 467 (4).
- Toronto Master Gardeners. (2012). *Sterilizing Wooden Containers*. Retrieved from <http://www.torontomastergardeners.ca/index.php/askagardener/sterilizing-wooden-containers/>
- West Coast Seeds. (2013e). *Eat Local, Grow Food, Grow from Seed*. Retrieved from <http://www.westcoastseeds.com/#sthash.H9EmZJQR.dpbs>

## **Maintenance**

- BC Farms & Food. (2014). *What weeds can tell you about your garden*. Retrieved from <http://bcfarmsandfood.com/what-weeds-can-tell-you-about-your-garden/>
- BC Ministry of Agriculture and Lands. (2002). *Weeds BC identification & management*. Retrieved from <http://www.weedsbc.ca/>
- Feasel's Home & Garden Centre. (2013). *How to Remove Thistle Weed Killer* [photograph]. Retrieved Nov 24, 2014, from <http://feasels.com/fertilizing-weed-control/weed-control/how-to-remove-thistle-weed-killer/>
- Forestry Facts. (2013). *Controlling invasive plants*. Retrieved from [http://www1.toronto.ca/city\\_of\\_toronto/parks\\_forestry\\_recreation/urban\\_forestry/files/pdf/Controlling\\_Invasive\\_Plants.pdf](http://www1.toronto.ca/city_of_toronto/parks_forestry_recreation/urban_forestry/files/pdf/Controlling_Invasive_Plants.pdf)
- Gardener's Supply Company. (2014). *When to water: How to water plants? It's all about paying attention*. Retrieved from <http://www.gardeners.com/how-to/when-to-water/8108.html>
- Gembara, K. (2014). *Some Help Controlling Bindweed* [photograph]. Retrieved Nov 24, 2014, from <http://digrightin.com/blog/whats-the-story-wild-morning-glory>
- Kiwicare. (2011). *Dock* [photograph]. Retrieved Nov 24, 2014, from <http://www.kiwicare.co.nz/garden/weeds/a-g/dock/>
- Simply Green Lawns. (2012). *Weed Control* [photograph]. Retrieved Nov 24, 2014, from [http://www.simplygreenlawns.co.uk/controlling\\_weeds.html](http://www.simplygreenlawns.co.uk/controlling_weeds.html)
- Trustees of Reservations - Boston Natural Areas Network. (2006). *Basic community garden plot maintenance*. Retrieved from [http://www.bostonnatural.org/cgGTips\\_PlotMain.htm](http://www.bostonnatural.org/cgGTips_PlotMain.htm)
- Weed Man. (2014). *Quackgrass* [photograph]. Retrieved Nov 24, 2014 from <http://weedmanusa.com/resources/quackgrass.html>

## **Plant Protection and Pest Control**

- Clayoquot Biosphere Trust (2011). *The West Coast Gardening Guide*. Retrieved from [http://clayoquotbiosphere.org/wp-content/uploads/2011/01/West\\_Coast\\_Garden\\_Guide.pdf](http://clayoquotbiosphere.org/wp-content/uploads/2011/01/West_Coast_Garden_Guide.pdf)
- Graff, D. (2014). *Using Row Covers* [photograph]. Retrieved Nov 24, 2014, from <http://squarefootabundance.com/using-row-covers/>
- Hall, J. (2013). *Instant Taps for Your Raised Garden Beds* [photograph]. Retrieved Nov 24, 2014, from <http://www.gardenista.com/posts/instant-taps-for-your-raised-garden-beds>
- McQuade, M.F. (2011). *Winter foes: Sun, wind and snow*. Retrieved from <http://www.canadiangardening.com/how-to/gardening-basics/winter-foes-sun-wind-and-snow/a/29569/2>
- Pottorff, L.P. (2010). *Some Pesticides Permitted in Organic Gardening*. Retrieved from <http://www.colostate.edu/Dept/CoopExt/4dmg/VegFruit/organic.htm>

West Coast Seeds. (2013f). *Winter Crop Protection*. Retrieved from <http://www.westcoastseeds.com/topicdetail/topic/winter-crop-protection/>

West Coast Seeds. (2013g). *Integrated Pest Management*. Retrieved from <http://www.westcoastseeds.com/topicdetail/topic/integrated-pest-management/>

Wilson, C. & Tisdell, C. (2001). Why Farmers Continue to Use Pesticides Despite Environmental, Health and Sustainability Costs. *Ecological Economics*, 39, 449-462. Retrieved from [http://ac.els-cdn.com/S0921800901002385/1-s2.0-S0921800901002385-main.pdf?\\_tid=e9b70d34-6b7b-11e4-8095-00000aab0f6b&acdnt=1415914247\\_d7c0a7a96fe5034f7f5762b65aeae2](http://ac.els-cdn.com/S0921800901002385/1-s2.0-S0921800901002385-main.pdf?_tid=e9b70d34-6b7b-11e4-8095-00000aab0f6b&acdnt=1415914247_d7c0a7a96fe5034f7f5762b65aeae2)

### **Developing a Garden Program**

Germain, A., Gregoire, B., Hautecoeur, I., Ayalon, R. & Bergeron, A. (2008). *Guide to Setting Up Your Own Edible Rooftop Garden*. Retrieved from the Alternatives and the Rooftop Gardens Project website [http://archives.rooftopgardens.ca/files/howto\\_EN\\_FINAL\\_lowres.pdf](http://archives.rooftopgardens.ca/files/howto_EN_FINAL_lowres.pdf)