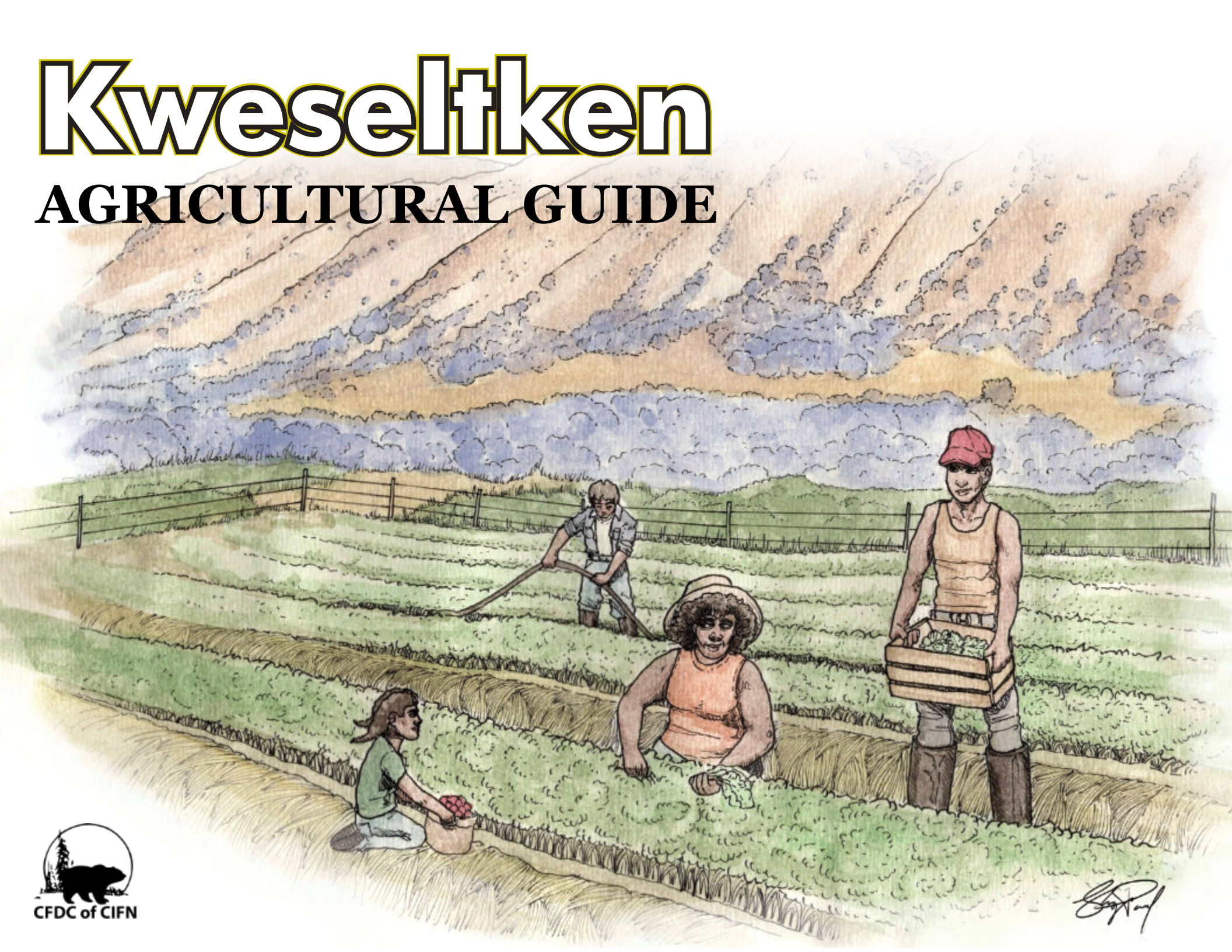
Kweseltken

AGRICULTURAL GUIDE



CFDC of CIFN

Table of Contents

Weyt-kp xwexwéytep (hello everyone)!

Community Futures Development Corporation of Central Interior First Nations (CFDC of CIFN) welcomes you to learn more about agriculture techniques and activities within our region. On behalf of our Directors, Staff, Contributors, Elders and food security partners, please enjoy the teachings within this curriculum document.

CFDC of CIFN provides support to Indigenous entrepreneurs who require advisory services, business guidance, training and start-up capital for business loans. If you or your organization wishes to hear more and learn how to be active within the food security process, please do not hesitate to contact us.

Kweseltken Documentary

Our return to the land is part of the journey towards truth and a better way of life. Watch the **Kweseltken Documentary**, share it with others and be part of the solution!

This video was created by the Community Futures Development Corporation of Central Interior First Nations together with Mastermind Studios Kamloops.

About the Guide

Growing strawberries in Secwépemc'ulucw (Farm N Stuff)

Weyt-kp xwexwéytep (hello everyone)!

This guide has been largely compiled from conversations with local producers living and growing food mostly on Secwépemc territory, including Tk'emlups, Simpcw, and Skeetchestn, and well as on Nlaka'pamux territory. The producers come from many backgrounds, and identify as both Indigenous and non-Indigenous; see the Acknowledgement section to see who participated.

Information in this guide also comes from a variety of books and online sources, which are listed on the bottom of each page under Further Reading and in the Appendix.

How to Use the Guide

Use this guide to assist you in determining if you are ready to become a farmer, or if you have already been farming, if you want to expand your operations. The intention of this guide is to learn from other local and experienced producers, and make your own plans to expand or diversify your agriculture operations. It can be printed in full, or accessed online at https://kweseltken.pressbooks.tru.ca/, where all of the hyperlinks and online videos will be accessible.

This guide has information about a wide range of agricultural practices and topics. There are interactive sections of this guide with questions to guide you in thinking about your own operation; you might want to have a separate notebook to work through the sections and take notes. We recommend that you start in Chapter 1, and move through each section, until you reach Chapter 4, which contains information on enterprises you might be interested in. You might choose one or two enterprises that you are interested in, or review each one. Here is an overview of all of the chapters:

- Chapter 1. Initial Assessments
- Chapter 2. Setting Up Your Farm
- Chapter 3. Land Management
- Chapter 4. Enterprises
- Chapter 5. Selling and Distribution

We wish you all of the best with your farming operation; this is such an important journey to be on, taking care of the land, growing food for yourself and your community, and contributing to food sovereignty here in Secwépemc'ulucw.

Acknowledgements

Interviewees

Dezmond Allen, Regenerative Pasture Systems

Daniela and Ed Basile, SSOL Gardens

Serena Black, Science Research Specialist, Industrial Forestry Service Ltd.

George Casimir, Farm N Stuff

Paula Cranmer-Underhill, Spapium Farm

Dieter Dudy, Thistle Farm

Fred Fortier, Uncle Freddy's Hothouse

Shelaigh Garson, Everyone's Eden

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CFDC of CIFN

Videos

Three videos were created to compliment the guide produced by Mastermind Studios, talking to Fred Fortier, Dezmond Allen, and Shelaigh Garson.

Watch them here!

Food Sovereignty and Secwepemctsín Values

Food Sovereignty

Food sovereignty is a powerful concept, and one that is at the centre of this guide. "When communities are free to shape their own food systems, food can be a vehicle to justice, health and sustainability to all" (Seed Change). By collecting and sharing knowledge from producers growing in Secwepemcu´l'ecw, we can empower the next generation of farmers to take care of the land, grow and share good food, and be more resilient in times of climate and political changes. We can learn from Elders who have decades of collective growing knowledge, learn from their mistakes, and create more sustainable and resilient farms.

> *"Food sovereignty is what we mean when we talk about reclaiming the power of food. When food is grown by farmers to benefit their communities, it can provide nourishment and security without damaging the land. This kind of agriculture can make us stronger, healthier, and more connected to the land, to our culture and to each other. That's the power of food... It also recognizes the various layers of discrimination that combine to place an even heavier burden on some family farmers, like women, Indigenous people, youth, and LGBTQ2S farmers."*
> ***– Seed Change***

The six pillars of Food Sovereignty were defined by farmers at the International Forum for Food Sovereignty in Nyéléni, Mali, in 2007, and a seventh pillar was added by members of the Indigenous Circle during Food Secure Canada's People's Food Policy process.

- **Focuses on food for people –** Food is more than a commodity. People's need for—and right to—food must be at the centre of policies.
- **Builds knowledge and skills –** We need to build on traditional knowledge, using research to support this knowledge and pass it to future generations. We also need to reject technologies that undermine or contaminate local food systems.
- **Works with nature –** We need to optimize the contribution of ecosystems and improve resilience through the use of diverse agroecological production and harvesting methods that and improve ecosystem resilience and adaptation, especially in the face of climate change.
- **Values food providers –** We need to support sustainable livelihoods for farmers and everyone else involved in food production or harvesting, and we need to respect their work.
- **Localizes food systems –** We need to reduce the distance between food providers and consumers, to reject dumping and inappropriate food aid, and resist dependency on remote and unaccountable corporations for food and seed.
- **Puts control locally –** We need to place control over food systems in the hands of local food providers and reject the privatization of natural resources. We also need to recognize the need to inhabit and share territories.
- **Food is sacred –** Food is a gift of life, not to be squandered. It cannot be commodified.

Food Sovereignty in Secwepemcúl̓ecw

> *“For me, to be around a garden, it is all about being responsible as an individual to grow good food. Food sovereignty is an individual responsibility… It’s about growing your own food, it’s not about other people growing your food.” –* ***Fred Fortier (Uncle Freddy’s Hothouse)***

Further to these international pillars, Fred Fortier (Uncle Freddy’s Hothouse) identified these four important elements of food sovereignty in Secwepemcél̓ecw:

- **Water sovereignty –** We need access to free, good water to grow crops and animals. If you are paying for expensive water or it is not clean, your operation will not be sustainable. Find a property with access to good water that you can use at an affordable rate.
- **Seed sovereignty –** We need control over our seeds. Sourcing local seeds or saving your own will produce crops that are more resilient to changing climatic conditions.
- **Land sovereignty –** We need access to communal land to build strong communities; in those shared spaces where everyone has emotional and physical safety, we can teach others how to grow food, how to prepare food, and heal from historical trauma.
- **Social sovereignty –** There is a history of forced labor in residential schools, and many Indigenous people don’t want to farm today. Part of this healing that we can work towards is understanding our history, listening to and sharing knowledge from Indigenous producers, and supporting those Indigenous producers. This support can come from Bands, customers, and peers purchasing produce grown by local farmers.

> *“People can flourish in the garden, feel good, and see things grow. Make sure the people who work there are caring, and make sure it stays safe, for example implementing Secwépemc language into the garden.” –* ***Fred Fortier (Uncle Freddy’s Hothouse)***

Secwepemctsín Values and Language

> *“Metwécw means sharing food. Reciprocity is the principle of Indigenous culture, it’s one of the pillars of our value system.”*
> ***– Fred Fortier (Uncle Freddy’s Hothouse)***

There is an overarching value of reciprocity in Secwépemc culture which is evident in the Secwepemctsín language. Here are some examples:

- **Metwécw –** Sharing food
- **Yecwemenul’ecwu –** Caretakers of the land (referring to the role and responsibility of Secwe´pemc people as caretakers)
- **Knucwetwécw –** Working together, cooperating, helping one another.

These words are from: “Eating Our Culture”: Intersections of Culturally Grounded Values-Based Frameworks and Indigenous Food Systems Restoration in Secwepemcúl̓ecw by Libby Jay Chisholm.

Further Reading

- Planning for Food Security Toolkit (FNHA)
- Indigenous Food Sovereignty

1.0 Business Planning

"You've got to educate yourself on business and marketing if you want to be an agricultural producer, and if you don't, it's not going to be sustainable. You can use the best regenerative practices, and do really good on the land, but if you can't survive on the money that you're making, it's just not sustainable. That business part is huge. "What's the return on investment from this?" It's a mindset."
– Dezmond Allen (Regenerative Pasture Systems)

Farm Business Planning Workbook

The first step in an orderly planning process is a self assessment of farm business management practices. This Farm Business Planning Workbook For The Beginning Farmer is a good place to start; it includes the following sections:

- Business Strategy
- Marketing Strategy
- Production Economics
- Human Resources
- Financial Management
- Social Responsibility
- Succession Planning
- Business Structure
- Risk Assessment

ACTIVITY:

Self Assessment

Work through the A Farm Business Planning Workbook For The Beginning Farmer.

CFDC of CIFN

Community Futures Development Corporation of Central Interior First Nations (CFDC of CIFN) promotes and provides community economic development support services to Indigenous people within the Central Interior of British Columbia. This Business Plan Workbook is a guide to assist you in developing and writing your own business plan. There are more business resources on the website.

*"Being a farmer, you have to work **on** your business and **in** your business. Working **on** your business is being on the computer, keeping records, marketing, getting customers. You can get lost working **in** your business, looking at the chickens, enjoying the moment, I would spend all day out here if I could, but I can't with my off-farm job, being with the animals is what I love."*
– Dezmond Allen
(Regenerative Pasture Systems)

Farm Business Planning Resources

- Taking Stock website
- Small to medium-sized farm start up guide
- BC Government – Starting a new farm

"When you are only doing something halfway, and you are feeding the money from your job into the farm, it doesn't work... As far as being a sustainable family business to produce income, if that's what you are after, then you have to approach it in a business-like fashion."
– Daniela Basile (SSOL Gardens)

Cultural Elements

If you identify as Indigenous, you can incorporate cultural aspects into your farm. Value-added experiences at your farm could be cultural elements (Paula Cranmer-Underhill (Spapium Farm) does cedar weaving for example and coordinates with Indigenous Tourism BC.

"Most of my business is First Nations. When you have good connections with other First Nations communities, you can sell there. You always have to have a good product."
– Fred Fortier (Uncle Freddy's Hothouse)

Organic Certification

If you are interested in organic certification, you can find information from the North Okanagan Organic Association, who certifies many farms in this area, or more general information from Organic BC.

Emergency Preparedness

With changing climate conditions and threats of wildfires and flooding, CFDC of CIFN has an Agriculture Emergency Preparedness Workbook that will help you think through how to protect your property in the event of an emergency.

Connecting with Organizations and Universities

Organizations to reach out to:

- CIFN of CFDC – Business resources
- Sto:lo Business Association
- BC Young Farmers Association
- Young Agrarians
- Vancouver Urban Farming Society
- Farm Folk City Folk

University programs:

- University of the Fraser Valley – Agriculture Center of Excellence
- Kwantlen Polytechnic University – Agriculture
- Thompson Rivers University – Sustainable Ranching Program

> *"When you go to workshops, you will always learn something from all of the people in the room, even if they are there to learn also."*
> ***– Paula Cranmer-Underhill (Spapium Farm)***

Provincial Support

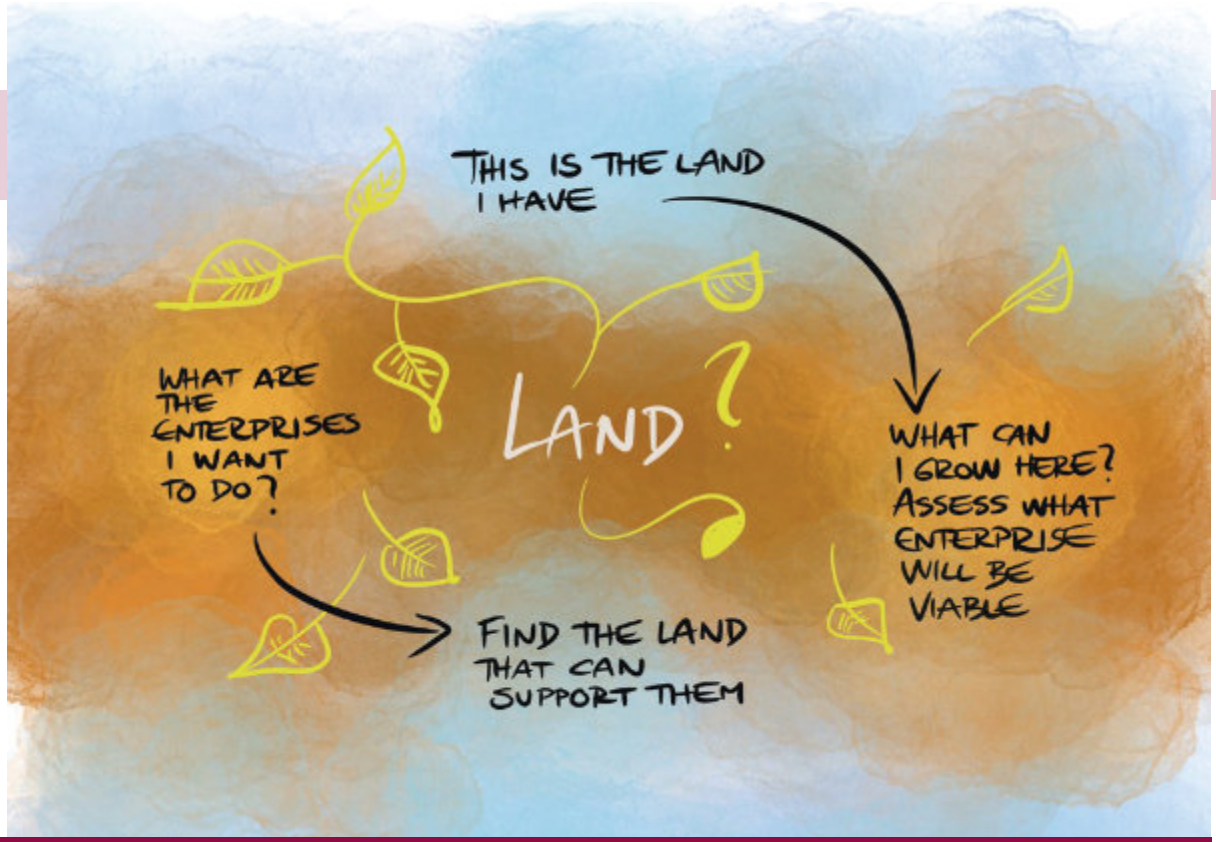
- BC Indigenous Agriculture Development Program – to assist with business planning and feasibility analysis and other programs offered by the BC Ministry of Agriculture
- Ministry of Agriculture, Indigenous and Entrepreneur Services
- AgriServices, Province of BC
- Indigenous Tourism BC
- VanCity bank provides small farm loans

1.1 Land Assessment

Looking for Land

There are two different approaches to take when you are looking for land; you can look for land to support your farming idea, or you can look for land and then come up with an idea based on what you can grow there.

If you are trying to find land, you can connect with the BC Land Matching Program by the Young Agrarians, and get in touch with the coordinator for the Okanagan-Thompson region. You should also make sure that you talk to people, build your networks, make a website or a Facebook page to get the word out that you are looking for land to farm! Here are more tips from The Market Garden.

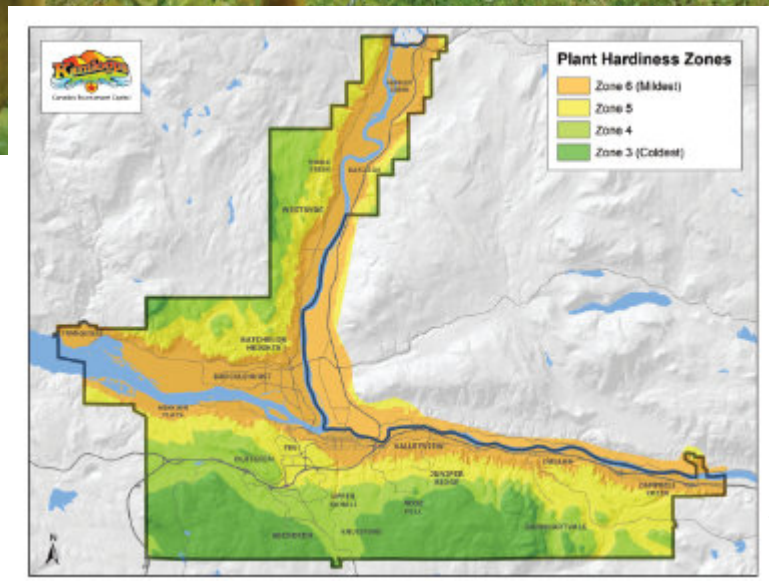


Site Evaluation Checklist

- ☐ Consider these questions when evaluating potential sites (will depend on the enterprise(s) you are planning to do):
- ☐ Determine the **hardiness zone** of property, and the last spring and first fall frost dates (see Climate Assessment below).
- ☐ What is the **water access** like? Is the water clean enough for irrigation? Is there potable water for humans and animals? Is there a functional irrigation system? If it needs repairs, do you have time/money to make them?
- ☐ Is the site **accessible** by vehicle all year-round?
- ☐ What is the **slope** and **orientation** of the property? Is there a lot of southern sun exposure?
- ☐ What kind of **soil** is it? Is it clay, sand, or silt? Is it healthy or has it been contaminated?
- ☐ Is there existing **fencing**? Will fencing need to be installed?
- ☐ Is there an annual **flood** or **wildfire** risk?
- ☐ What **structures** are on the property? Do they need repairs? Are they close to the garden or animal fields?
- ☐ Does the site have **electricity**?
- ☐ Is there a **customer base** (farmers' market, restaurants, CSA members) for local produce or meat? Is there room for new producers?
- ☐ How far is it from a **central market location**? This will give you the travel time each week.

Lease Considerations:

- ☐ What areas of the field do you have access to?
- ☐ Will the land-owner sign a lease for more than 5 years?
- ☐ Will you have access to the structures on the property?
- ☐ Is there equipment that you can use?
- ☐ What is the history of the property? How has the land been used historically?
- ☐ Is there a building or temporary structure for me to live in? If not, consider your living situation and travel distance to the farm.



If your property is in the City of Kamloops, you find the plant hardiness zone at kamloops.ca

Climate Assessment

The climate will be different depending on the location of your farm, so look up the frost dates and plant hardiness zones for your area to help you figure out what crops you can grow, and which ones might need to be in a greenhouse if your property is cooler. The frost dates will give you information about when you can plant your seeds or transplants outside after the last frost, and when everything needs to be harvested before the first frost.

- BC First Frost Dates
- BC Last Frost Dates
- Plant hardiness zones
- West Coast Seeds: South Central Planting Chart

Self Assessment

Think about these questions as you are looking for land; the property will determine what you can grow and the distance to your customers, so consider these ideas in your planning process:

Lease Agreement

If you are renting or leasing your land, setting up a lease agreement is strongly recommended. Once you have the land, you will need to write a lease agreement with the land owner. Young Agrarians has a wonderful Transition Toolkit for this process, that takes you through each step of the transition. Make sure you have something in writing if you are renting or leasing the property, so that if there are any disputes, you will have a document to refer to.

> *"Be honest and transparent with your ideas, and people will be more likely to want to work with you. Talk to the land owner often, and make sure the lease is for at least 5 years. Like most beginning farmers, you will rely on off-farm income for a few years, so it takes a few years to get enough income from the farm to do it full-time."*
> ***– Dezmond Allen (Regenerative Pasture Systems).***

1.2 Mentorship and Learning

Learning about Farming

> *“For new farmers, invite the Elders out, come have tea and a little snack, and just sit and talk with them about how they used to do things, and get people together. Listening to my mom talk about how things were…tea was always on the wood stove, and sacks of mysterious medicines always nearby.”* ***– Paula Cranmer-Underhill (Spapium Farm)***

There are so many ways to learn, how do you learn best?


Talk to other growers to learn

You can learn about farming by reading books (and this guide!), watching videos, reading websites, talking to people, visiting farms, but most of all, try farming! Talk to people who are farming in your area, and volunteer with them for a week (or more), and get a sense of what the day to day tasks are. Many people work on other farms for a few years to learn before going out on their own, while others get university certificates, and other just start! You will find your own path.

> *“Farming is all about hands on; you can learn a lot on YouTube or from a book, but make sure you get hands on.”*
> ***– Fred Fortier (Uncle Freddy’s Hothouse)***

Farming is all about constant learning, remember that when someone has farmed for 30 years, they have only farmed 30 times; it takes a long time to try things out when it only takes one full year do it! The more you can learn from others before you start your own operation, the further along you will be.

> *“Ask for help from your family and friends, and cook them dinner! Have your farm be a centre of activity, you hear stories from other people who farmed.”*
> ***– Paula Cranmer-Underhill (Spapium Farm)***

Make Connections

You will need a couple of people that you can call to help when you need it (make sure to repay the favor!). When your onions have all died and you have no idea why, or your apples are full of worms, or the fall rye just isn’t growing well, you will need someone (or different people) to call.

> *“There is no one solution for everything, and no advice that will solve all your problems on the farm. You have to do the best you can and do what works best for you, but any advice given will always go a long way towards your success.”*
> ***– George Casimir (Farm N Stuff)***

Many farmers suggested creating a network of other farmers, especially in nearby growing areas like Vernon, Kelowna, or Enderby; farmers will share information when you ask them questions. Keep in mind that things that work for them, might not work on your farm, so having a larger network is important. You are limited when you only talk to the few growers close to you.

> *"Mentors are good, but I think the more information you ask of people (if you find someone who is willing to share things with you), the better... Find more than one mentor because different people find different things that work, and they don't always work for you. For example, I can't grow root crops because the bugs always get them. One farmer in Armstrong said, "Oh I plant twice as many, bugs can't eat that many." But at our farm, they do!"*
> ***– Daniela Basile (SSOL Gardens)***

Attending events like Seedy Saturdays and conferences (especially the COABC and BCAFM Conferences) when they are in your area, is important! You will meet people, and you will learn a lot from them when you spend the weekend at the conference.

You can also connect with your local industry associations. Go to farmers' institute, join forage council, or the BC Agriculture Council. The closest one to Kamloops is Chase Farmer's Institute.

> *"Everyone knows something, and everyone has a friend who knows something, so the synergy you get is really good."*
> ***– Paula Cranmer-Underhill (Spapium Farm)***

You are always learning

One of the wonderful (and frustrating!) things about farming is that you are always learning, whether you plan to or not! There might be an unexpected heat wave, a new pest eating your crops, the chickens are not growing as quickly as usual, and you will have to find a solution. You can plan as much as you can, but flexibility is important in this industry.

> *"You get prepared, and you try that crop (or whatever it is) and get it working; don't always plan that it's going to work. Then the following year you'll really figure it out, and by your third year it's a piece of cake. Once you got things going well, see if there is something else you can add to your repertoire; what else do you want to learn about? You are always learning."*
> ***– Daniela Basile (SSOL Gardens)***

How Do I Learn?

How do you learn best? Think about what information you will need in the first few years, and where you will find it.

- What past experience do you have that you learned from?
- Who can you reach out to with questions?
- Are there other people that you want to learn from?
- What areas do you still need to learn more about?
- How will you find that knowledge?
- Do you like books, websites, YouTube videos, online courses, post-secondary programs, or from other people?

TRU Sustainable Ranching Field Trip Schedule 2022

One great way to visit lots of other local farms is to attend the TRU Sustainable Ranching field trips. Visit their website for information on how to get in touch with them and ask about attending the free field trips.

2.0 Property Design

Site Data Collection Checklist

Before you start planning or expanding your farm operation, this is some of the information that you will need to collect. This checklist has been adapted from Richard Perkins' book, Regenerative Agriculture (p.68) and from Shelaigh Garson (Everyone's Eden).

- **Basic**
  - ☐ Topography
  - ☐ Views – desirable or undesirable
  - ☐ Risk of wildfire, flood, frost, etc.
  - ☐ Noise or pollution
  - ☐ Off-site concerns: Unpleasant odours, dust, privacy, etc.
- **Map**
  - ☐ Legal property lines (the City of Kamloops map and TNRD map)
  - ☐ Location of existing utility/water/gas lines (Click Before You Dig)
  - ☐ Location of sewer/septic system
  - ☐ Location of water access
  - ☐ Aerial photos (Google Maps or with a drone)
  - ☐ Contour map (the City of Kamloops map and TNRD map)
  - ☐ Determine slope gradient
  - ☐ Identify keylines, valleys, and ridges
- **Climate**
  - ☐ Light availability – How does the sun, rain, clouds, fog impact the light?
  - ☐ Average rainfall (monthly and annually)
  - ☐ Temperature (hardiness zone)
  - ☐ Solar aspect – Find the solar aspect through the seasons; find the solar aspect on June 21 (longest day of the year) and December 21 (shortest day with the least sun) using online tools.
  - ☐ Wind aspect – Where does the wind come from? Does it change through the seasons or time of day? You might want to design wind breaks if any spots are particularly windy.
- **Water**
  - ☐ Water quality
  - ☐ Existing water rights
  - ☐ Drainage patterns
  - ☐ Springs, creeks, ponds, rivers
  - ☐ Flood levels (50 or 200 year flood)
- **Access**
  - ☐ Location of driveways
  - ☐ Wildlife – Are there common access points of deer or other wildlife moving through the property?
- **Structures**
  - ☐ Location of buildings, greenhouses, compost systems, etc.
- **Trees**
  - ☐ Existing trees and how healthy they are
  - ☐ Density
- **Soils and Geology**
  - ☐ Soil assessment (3.0 Soil Health)
  - ☐ Soil type
  - ☐ Soil tests for nutrient levels (3.0 Soil Health)
  - ☐ Try to find out the history of the property

Property Design

When designing your property (either from scratch or with existing infrastructure), using the framework of water, access, and structures will help guide you through the process.

1. Water

Whether it's a hose, or a river, you have to consider where your water is coming from, and what your water needs are.

- Where is your water coming from?
- Do you need a pump system?
- Do you need irrigation? What will your system need?
- Can you incorporate natural systems into water harvesting? Is there a wetland on the property?
- Do you need to harvest water, or do you have lots of water on your property?

Reference 2.2 Water Access and Irrigation for more information.

> *"The best place to store water is in the soil, you can design create a holding pond, berms, swales, or mulch units to store that water. Soil is a sponge if it's healthy."*
> ***– Shelaigh Garson (Everyone's Eden)***

2. Access

- Where is the sun? Where does the wind come from?
- What are the contours of your land?
- How are you going to access various areas of your food production facility?
- How will you access the structures; consider the house, growing area, wash station, water access, food storage, roads, walking pathways, etc? What are the easiest pathways to get to each structure?
- Consider footpaths, walking time, and permaculture zones

3. Structures

- Infrastructure includes house, greenhouse, wash stations, tool storage, food storage
- Rock bluff
- Stand of trees

“Using the Permaculture Principles to outline property design, the first principle is to Observe and Interact; it is very difficult to do, as it requires you to sit and watch, and not change anything. We want to change the land as soon as we can, but we don’t know it very well yet. Can we sit and wait for a year before starting our work? If not, try to talk to someone nearby the property who has seen the area change over the year. That way, we can see the changes through the seasons, and know how the land changes. If half of it floods every year, it is better to know where that happens before you decide to build a chicken coop there.”

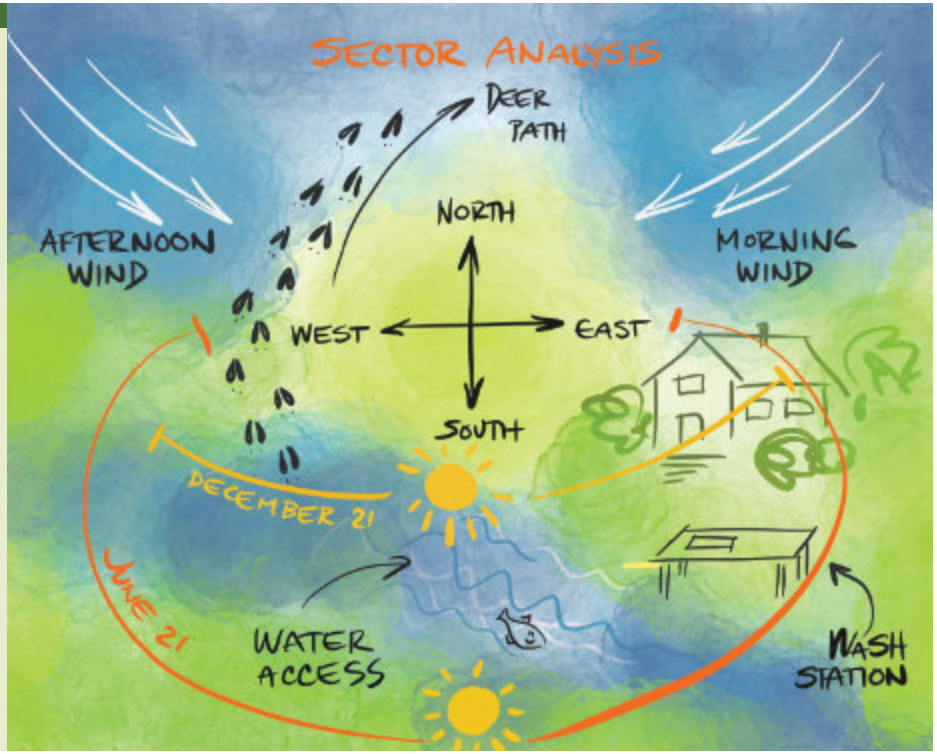
– Shelaigh Garson (Everyone’s Eden)

Sector Analysis

ACTIVITY:

Conduct a Sector Analysis on your property

1. Start with a site plan – Find a map that includes legal property lines (the City of Kamloops map), and the location of existing utility/water/gas lines and sewer/septic. You can also find or take aerial photos (Google Maps or with a drone) for the birds-eye view.
2. You can also get more detailed maps that include contour lines, slope gradients, valleys, and ridges.
3. Overlay your map on a piece of graph paper, and plot the water, access, and structures on the property:
   a. Water (water hydrant, faucet, irrigation, well, river, pond)
   b. Access (driveways, roads, paths)
   c. Structures (house, greenhouse, shed)
4. Then, work through the main sectors that will impact your farm:
   a. **Sun –** What is the path of the sun on June 21 (longest day of the year) and December 21 (shortest day of the year)?
   b. **Wind –** Where are the morning and afternoon winds? Do they change through the Summer and Winter?
   c. **Wildlife –** Where are the deer and other wildlife moving through the property?
   d. **See the site checklist above** for more ideas to put on your analysis.



You can also incorporate permaculture zones into your design:

- **Zone 0:** The people and your house, and other areas you are in multiple times a day.
- **Zone 1:** Areas that you visit daily (e.g. kitchen herb garden, chicken coop)
- **Zone 2:** Areas you visit weekly (e.g. greenhouses, high maintenance crops, shed, compost bin)
- **Zone 3:** Areas you visit semi-regularly (e.g. low maintenance crops, fruit and nut trees, bee hives, cattle).
- **Zone 4:** Areas that are mainly wild, but managed occasionally (e.g. harvest wood for firewood or have native plants for wildlife).
- **Zone 5:** Wild areas which wildlife frequent.

Permaculture

> *"Permaculture is a systems design that mimics nature, and integrates design that stacks functions. Enhancing natural systems, take what you have in the place you are, and design it in a more holistic way, more circular way. These practices have been used for thousands of years, no one invented it."*
> ***– Shelaigh Garson (Everyone's Eden)***

Permaculture is a combination of perennial systems that work in conjunction with one another, in a forest ecosystem, growing food, medicine, or fibre. It involves designing with plants with a purpose that gives back to the natural system and has a yield for humans, but not at the cost of the system. One example of a permaculture practice is a Food Forest, where trees and shrubs and other perennials are planted in such a way to support each other's natural functions.

Further Reading

If you want to learn more about design principles, you can look into permaculture books (suggested below), or holistic management.

- Principles of Permaculture website
- Verge Permaculture: Website and YouTube channel
- The Permaculture Handbook: Garden Farming for Town and Country by Peter Bane
- Gaia's Garden: A Guide to Home-Scale Permaculture by Toby Hemenway
- Regenerative Agriculture: A practical whole systems guide to making small farms work by Richard Perkins

2.1 Farm Labour

While you might want to do everything yourself, you will need some help! It might be from friends and family for a little while, but you when you need to hire some employees or find long-term volunteers, and here are some ideas to consider.

Areas of Farm Work:

1. **Field work –** planting, greenhouse work, pruning, thinning, weeding, irrigation, harvesting, compost work, etc.
2. **Animal work –** giving animals food and water, moving them to a new field, collecting eggs, cleaning pens, caring for them if sick, etc.
3. **Market preparation –** harvesting, washing, bunching, bagging, weighing produce, etc.
4. **Sales or retail –** farm stands, CSA, selling products at market, delivering products to restaurants, etc.

Labour Options

Volunteers:

- WWOOF – often enthusiastic, range of skills, have to provide an experience (take them sight-seeing, meals, housing, etc)
- Farm Stay
- Young Agrarians
- People who live nearby

> *"Probably the best help we have had over the years is from people who volunteer, because they wanted to learn. They would come, and we would show them."*
> ***– Daniela Basile (SSOL Gardens)***

Employees:

- Minimum wage is often sufficient for the first year of work
- Canada Summer Jobs program (19-30 years old, summer student program)
- Huge range of skill/experience

> *"It is really hard to find people to work in Kamloops."*
> ***– Daniela Basile (SSOL Gardens)***

Possible interview questions for farm labourers:

- How far from the farm do you live? Do you have a reliable mode of transportation?
- What is your relevant work experience?
- Do you work well independently?
- What are your available hours? Are you able to work until the tasks are completed or is your time limited?
  - For example if you are selling at the Kamloops Regional Farmers' Market on Wednesdays and Saturdays, Tuesdays and Fridays are the big harvesting days (especially Friday for the larger Saturday market). In the Spring, harvesting and market prep might occur between 8am-2pm, but in August-October it might be 6am-9pm.
- What time off do you need this summer? Establish how much notice you would prefer before time off is requested.
- Check personal references!

> *"I have someone who lives on my property to help with farm tasks. Even with him, it is a lot."*
> ***– George Casimir (Farm N Stuff)***

Friendly customer service

Feeding animals

Field work

2.2 Water Access and Irrigation

Water Access

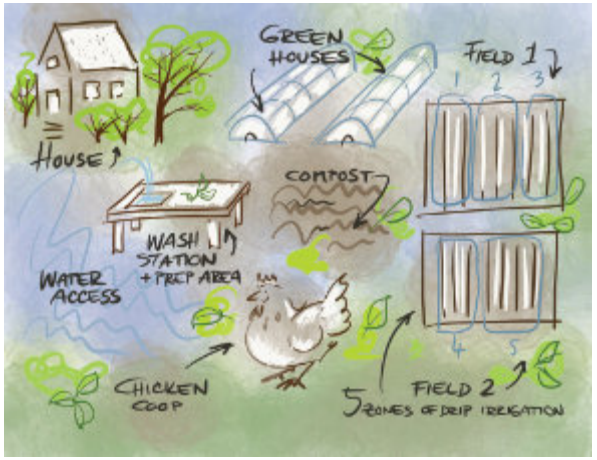
> *“Drill a well. You don’t have water, you have nothing. Make sure it is tested, good, and tested water. I have an artisanal well, and access to lots of water on my farm.”*
> ***– Fred Fortier (Uncle Freddy’s Hothouse)***

Water on your property can come from a variety of places including directly from a river, well, part of a rain catchment system, stored in the soil, municipal water system, or reservoir. If you are using it to irrigate crops, it needs to be clean, and not polluted. If it is for washing produce and drinking water for animals, it also needs to be potable.

- **Municipal/Band:** Water through the municipality or Band will have been treated and is potable (safe for human and animal consumption). This water will be safe to wash produce with, feed to animals, and drink yourself, but you pay for what you use, so it can get expensive if you are irrigating or washing produce for hours.

- **Rain catchment system:** Rain barrels and larger containers can store water off of roofs. Keep in mind that every rain event might add a lot of water, and the amount of water you capture is limited by the size of your storage containers.

- **Reservoir:** If there is no water access on your property, it might be necessary to dig a pond on the property. Hiring an excavator, deciding what to do with all of the soil that was dug up, adding aquatic plants and a filtering marsh, and installing a pump will be important to keep the water clean for irrigation needs.



- **Soil:** Keeping your soils healthy and full of organic matter will store large amounts of water every time it rains. Water will drain through poor, sandy soils with little organic matter, and wash away nutrients.

- **Surface water:** This will come from large pipes up from the river, and works well for irrigation, but is not potable. Your water licence will dictate how much water you can take.

- **Well:** You might need to drill one or if there is an existing one, you will have access to a lot of water, though the quality might vary. Test the water annually to ensure it is being treated properly to not get anyone sick or damage crops.

At the end of the day, your water system might be different from your neighbors, any system will need to have sufficient water for the scale of your operation, and be reliable year-round.

Irrigation

Think about where you need water on your property: house, greenhouse(s), wash station, animal paddock/ coop, and in the fields. The drawing to the left shows all of the buildings in this example that need water, as well as the fields.

> *“My irrigation comes up from the river, through old flume lines. We also dug a larger pond with a pump, then through a 2” pipe to the edge of the garden, then drop lines down each row. Pipes have knobs for each zone, and we manage them.”*
> ***– Paula Cranmer-Underhill (Spapium Farm)***

Depending on your enterprise, your water and irrigation needs will be different, but no matter what you are doing, you will need to be able to get water to the right place at the right time. Water is SO important, especially in our hot and dry climate; you can lose plants in a matter of hours if they are not getting sufficient water, with months of work going to waste. Of course animals need fresh water daily, and sometimes twice a day in the summer heat.

Before you buy your animals and your seeds, spend time figuring out how you will get water where you need it. You do not want to design a space (refer to section 2.0 Property Design) where you have to walk far with buckets of water or drag heavy hoses around.

> *“When planning your irrigation, you need to know how much water you use. You also need to run irrigation lines along the slope, not up or down it. I learned that the hard way.”*
> ***– George Casimir (Farm N Stuff)***

Plastic mulch with straw in pathways

Garden Design

Zones: Consider the needs of the plants when you plan the fields; crops that need more water should be planted together in the same zone, and those with lower water needs should be in the same zone. You also need to consider the soil type, sun exposure, crop rotation schedule, and any seed saving considerations (keeping distances between plants that will cross-pollinate) when planning the field!

Row sizing: Consider the length of the rows, and the distance between rows. You need at least 18″ between rows for space to kneel and weed, and push a wheelbarrow through. If you are going to mow between the rows, then make it the width of your lawn mower's wheelbase. Weed whacking between rows is not recommended; it covers your plants in debris, and it is very easy to damage plants that hang into the rows. If you are going to plant something specific between your rows, then think about how the path will be watered.

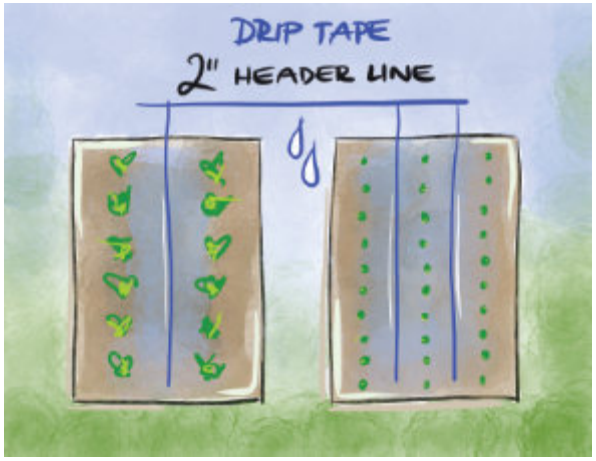
Bed sizing: When planning the length and width of your beds, consider what your plant spacing will be, and what your irrigation system will allow. The length of your row will depend a bit on your field size, but likely be less than 150ft. By standardizing the bed size, it is easier to reuse irrigation equipment. The width of your bed should be no more than 75cm (30″) across, as that is what you can comfortably reach from both sides. Depending on the crop, you can plant 1-3 rows in each bed. Keep in mind that dense plant spacing will reduce the amount of bare soil (and weeds). Note that standardizing the size of your beds will keep everything more simple for crop rotation, planning, and equipment sizing, e.g. 100ft beds, 30″ wide, with 18″ pathways between them.

> *"When we first started, we have everything on timers and in zones, but things got changed and I had to do it all manually which was awful. The things you learn!"*
> ***– Daniela Basile (SSOL Gardens)***

Mini sprinkler on a 1¾″ pipe, 18″ spacing at Uncle Freddy's Hothouse

There are several irrigation stores in the area, so it would be worth it to go to the store and have them help you map out your irrigation system. You will likely be making adjustments for a few years, and irrigation can get expensive, but you will save a lot of time and money in the long run by investing in proper equipment. Possible irrigation options include drip tape, small sprinklers, or pivoting irrigation lines. You might use one type or a combination, depending on how you mulch your beds, and your weed management system.

Drip tape: Drip tape is a plastic tube with small slits along one side (usually it has blue stripes so you can tell where the water comes out). It waters plants slowly at their roots, minimizing water consumption, and not damaging the leaves of plants (which overhead watering does). For your system, you will need to buy a roll of drip tape, a roll of header line, and a drip tape adapter for each row. If you have a high pressure system, you might want the drip tape adapter with flow control. You do not need to buy the pieces for the end of the drip tape, a simple tight knot is sufficient or folding it over itself and using a short piece of drip tape to hold it in place. You might also want connections, or you can pierce a hole in the header line with a special tool and connect it directly..

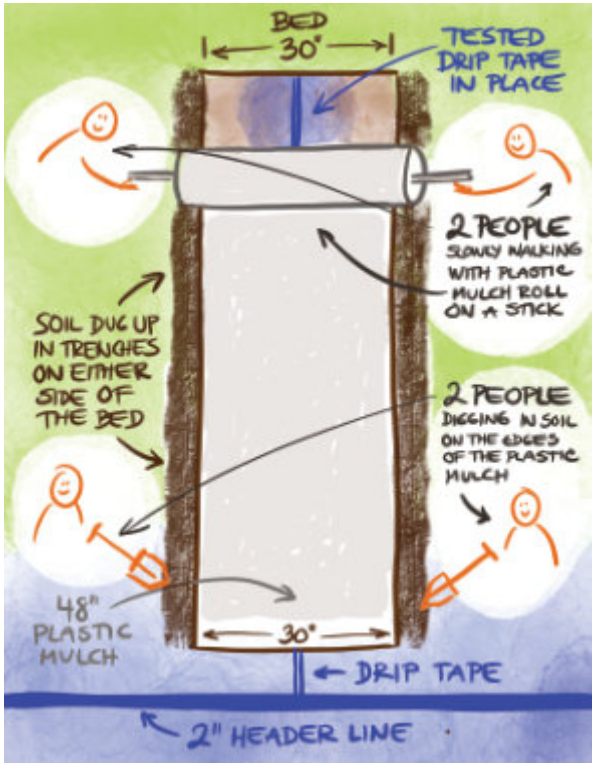


Roll of drip tape

Roll of header line

Drip tape adapter

Drip tape adapter with flow control



> *"Drip irrigation uses less water, putting water at the right spot at the right time."*
> ***– Dieter Dudy (Thistle Farm)***

When installing the drip tape, turn on the water first to make sure there are no holes and see how wide the drip tape waters; some farms gets 6″ on either side, some get 4″, depending on the water pressure. You will also need to experiment with the pressure running through the lines; too little pressure won't water plants at the end of the drip tape line, and too much will blow the line off. Testing the irrigation system will take several hours at the beginning of the season, but will save you a lot of time throughout the growing season.

Plastic mulch: You can lay plastic mulch (purchased in large rolls from agriculture supply stores) on top of the drip tape, landscaping fabric (burn holes for each plant to reduce fraying instead of cutting holes), or mulch crops with straw or leaf debris. Plastic mulch works very well to suppress weeds, keeps the soil warmer under plants like tomatoes and peppers that need heat, and can be easily cut with a knife to make small holes when planting transplants into it (you can also plant seeds, but the small seedlings are shaded by the plastic and don't grow as well as transplants which are higher than the plastic). It is hard to reuse though, and cannot be recycled. There are some biodegradable plastic mulches, but some farmers found they didn't last for the whole season, and the field was full of small pieces of plastic at the end of the year (which eventually broke down, but took a while).

If you use plastic mulch, lay the drip tape lines underneath first, before digging it in with the help of some friends, four people is ideal, the more the better though. You can buy 48″ plastic mulch from agriculture supply stores (for example Growers Supply Co), which gives you enough overhang on each side to maintain 30″ beds. First, dig trenches on either side of the bed (one large shovel of dirt is likely sufficient), then once the mulch is laid tightly on top, dig the soil back on the mulch. Maintain a straight line, and keep the plastic mulch taut.

Sprinklers: Sprinklers have a wider range than drip tape, and can be reused every year if treated properly. There are a wide range of sizes and heights that sprinklers come in, so going to a store and talking to the irrigation specialists might help you figure out what you need. You can find mini sprinklers that connect directly to the header line (1-2″ in diameter) and be placed directly on the ground (like in the photo above), or you could attach them to stainless steel rods or PVC pipe (4ft height works well). It depends on the needs of your plants, and the pressure of your irrigation system.

Pivot irrigation: Used for larger areas like pasture for animals.

> *"Initially I used overhead irrigation, but have moved to 100% drip lines. When things are growing, you do not want to be moving any lines. You always need to be checking on the lines to make sure things are working properly. I have 80 lines of drip tape that are 50ft long, and 20 zones of irrigation. I can run 10-15 zones at once, could do timers, but I know how many hours that each zone needs."* ***– George Casimir (Farm N Stuff)***

2.3 Structures, Tools, and Fencing

Structures and Production Areas

- **Animals** will need shelter (with the size appropriate to the number of animals you have), insulated in the winter, a fenced outdoor area, feed storage, and fencing.
- **Compost area –** You will need space for several piles or windrows of compost, as well as piles of the carbon inputs that you add as you add your nitrogren sources (greens) like plant debris and food scraps (your carbon sources (browns) like wood chips, leaves, small branches, straw, etc).
- **Crop storage –** See section 5.0 for details
- **Gathering space –** This is a space where people can sit and gather in; it could have a fire pit, hammocks, BBQ, a big table in the middle, or just chairs. You could meet here for meetings with staff/volunteers, invite friends and family over, or have meals with large amount of people.
- **Greenhouse/season extension tunnels –** Permanent or temporary structures for season extension might include row tunnels, caterpillar tunnels.
- **Market preparation –** Indoor/covered space to prepare vegetables for market/sales. It is important to be out of the elements, as crops will need to stay dry as you are bunching them, and putting them in boxes for the farmers' market or CSA boxes.
- **Nursery –** You can plant seedlings inside a building, in a greenhouse, etc. but you will need a warm space to grow all of the seedlings that you need.
- **Seed storage –** If you save any seeds, you will need space to store them in a cool, dry area
- **Storage area** for harvest bins, tools, and other equipment.
- **Washing Station –** Potable running water and large sink to wash crops in. This could be an outdoor station. Ensure that while you are washing the majority of your crops, you are standing straight up, as this is a position you (or someone else) will be in for hours every week for months. You can build your own, or buy one, there are many options and designs to pick from. There should be a large counter space next to the sink as well for vegetables to dry off a bit.
- **Water/irrigation systems –** Depending on your water and irrigation system, you might have a pond, water pump, well, or irrigation lines.

Tools

Some common tools include the following, many of which can be borrowed or rented:

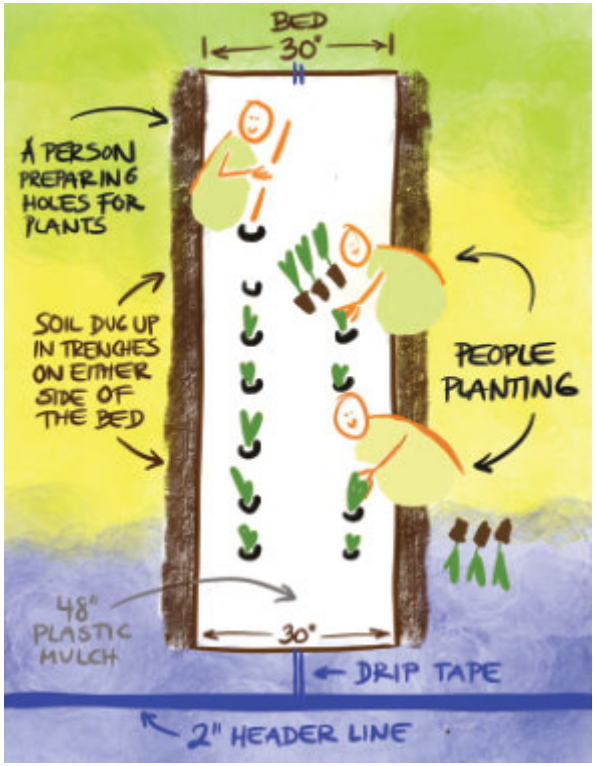
- **Gloves –** keep your hands warm and clean
- **Hand pruners** (for each farm worker)
- **Small kitchen knife** (for each farm worker) – what you will use to harvest a majority of your crops
- **Scale –** large enough to weigh 50lb boxes for record keeping
- **Stirrup/Dutch hoe or Wire weeder** for easy weeding
- **Stick** for making holes in the garden beds when planting (see drawing below)
- **Shovels**
- **Wheelbarrows**
- **Bins** to store harvested produce in, that nests and stacks, and has holes for ventilation. Around the size of 20 x 13 x 6″ works well, as it holds about 35lb of produce which is easy to carry for one person.
- **Boxes** to bring produce to market in, may have lids to stack higher

More information on tools and maintenance can be found on this The Market Gardener page.


Produce bins


Greenhouse in November


Tractor



Equipment

All of these are optional and will depend on the size and scale of your operation:

- **ATV or golf cart** (depending on your terrain) to move yourself and equipment around the property, and on harvesting days, stacking all of your boxes of produce in to drive back to your washing/sorting area
- **Tractor** – you can borrow one if/when you need one
- **Rototiller** – optional, may be able to borrow one
- **Wood chipper** to chip branches and woody debris for your compost pile or mulch
- **Chainsaw** if trees fall down and you need to clear them
- **Seed saving equipment** – you can borrow a winnower and thresher from the Kamloops Food Policy Council

Fencing

> *"Fencing is one of the first things you need to do on a property if there isn't one. You can hire someone to install it, or rent the equipment to install it properly. It is worth it to spend money on getting it built well, as you will need to keep wildlife like deer, bears, and wandering cattle out of your fields."*
> ***– Paula Cranmer-Underhill (Spapium Farm)***

Fencing is needed to both keep animals in, and animals out of areas. There are several types of fencing including:

- **Portable/mobile fencing** might be used for rotational grazing practices when you want to move the animals every few days. Examples include poultry netting, mobile pens, or electric wire.
- **Perimeter fencing** that is very high (7.5-8ft high) to keep out deer that have permanent posts in the ground, and plastic, wood, or metal fencing between posts. This can also be topped with electrical wire or barbed wire.
- **Permanent fencing around animal paddocks** or small fields that might not need to be as high if you already have perimeter fencing for deer, but instead keeps animals in, and protects against predators like lynx, foxes, or skunks.

> *"Electric wire can top the fence, but it needs to be totally clear of any vegetation to work properly."*
> ***– Paula Cranmer-Underhill (Spapium Farm)***

There are many considerations to make when deciding on fencing, and your needs may change over the years. It is something that usually needs to be done right away if there is no fencing installed already. Research the needs of your enterprise, talk to your neighbors to see what works (or doesn't) for them, and other experts in town.

> *"In terms of fencing, you really need to consider costs and budgeting, and think about it carefully to maximize use. Keep it simple."*
> ***– George Casimir (Farm N Stuff)***

2.4 Crop Storage

Harvesting

After harvesting your crops from the field, it is important to get them in clean bins, and into the shade or under shelter quickly. Especially in the summer heat, produce can start wilting quickly, which makes it less desirable to customers, and not store as long. You can also harvest early in the morning for temperature-sensitive plants (greens, herbs, etc). You will also want to harvest the crops that will take the longest to prepare, like carrots and beets that need to washed and bunched. Tomatoes don't need to be washed or bunched, so those could be picked later on; try to avoid picking them in the heat of the day though as the sun dries them out a bit, making them less sweet.

The containers that you keep produce in will impact how long it lasts. Thick plastic bins with tight fitting lids work well for some types of produce, but condensation can build up inside and cause them to spoil more quickly. Clear plastic bins with loose fitting lids allows some produce to breathe, and allows condensation to escape. Greens that are mostly water will dry out in the Kamloops heat, so pick them early, and get them under cool water and into the fridge in the morning on harvesting days.

> *"We use the see-through bins because they would let a little bit of air through. I could pack lettuce for the restaurants and I would go back and the chefs would tell me that it was still perfect heads of lettuce at the end of the week. The bins would allow the lettuce to stay pristine longer…We would wash the greens (lettuce, chard, arugula, and kale) and pack it in water, and the lettuce retains the water in the bin, stores upright."*
> ***– Daniela Basile (SSOL Gardens)***

Other crops like squash, cucumbers, and peppers will get slimy and rot if they are too wet. After they are cleaned, dry them completely (as best you can), and put dry towels on the bottom of the bin to keep them dry.

> *"I was going to thrift stores and buying towels to put at the bottom of the bins to absorb the moisture, and all of a sudden I was getting food to last for a really long time."*
> ***– Daniela Basile (SSOL Gardens)***

After harvesting, produce needs to be cooled immediately. You can buy a fridge, if you are going to keep it small. If you have access to a small room, you can add an air conditioner to a room, or add a "Coolbot" to it to keep it around 4C. For vegetables like squash, potatoes, you just need cool storage.

> *"If you are only going to grow as much as you can sell, don't worry about [cold storage]. If you are going to grow at a scale that you need cooling or storage, then those are two things you should probably address before you start harvesting…. Our first year, we were going, "Now what do we do with all of these vegetables?""*
> ***– Daniela Basile (SSOL Gardens)***

Hanging garlic to dry

Keep your cellar cool

Cool room for long term storage

Crop-Specific

Alliums (onions and garlic)	Sell fresh, or cure for 3-4 weeks and will store for up to 12 months.
Berries	Pick every day, do not store for more than 2 days. Excess berries can be processed and frozen
Cucumbers	Sell fresh, store for up to 1-2 weeks
Greens	Sell fresh, store for up to 1 week
Herbs	Sell fresh or dried. Dry in a warm, dry location for 1-2 weeks, sell in a bunch or in plastic bags
Peppers	Sell fresh, store for up to 2-3 weeks if not blemished. Can dry hot peppers and make into flakes
Root vegetables (carrots, potatoes, beets, etc)	Sell fresh, or store well for months if dry
Stone fruits	Sell fresh, store for up to 2-4 weeks
Summer squash (zucchini)	Sell fresh, store for up to 2-4 weeks
Tomatoes	Sell fresh, store for up to 2-3 weeks if not blemished
Winter squash	Sell fresh, or store well for months if dry

> *"If you don't have a place to process or store crops, you have to get rid of all of your crops by the end of the year before they go bad. In a rural location, you can't compete with low prices at grocery stores, but you might need to clear your inventory. Try to sell food to programs for Elders and youth. You will need to reflect on the extra crops you had at the end of the year, and make sure you don't grow too much and not sell enough."*
> ***– Fred Fortier (Uncle Freddy's Hothouse)***

Long-Term Storage

Through the growing season vs overwinter.

- **Cold storage** (around 0-4C, 50-60% humidity)- a fridge or temperature-controlled root cellar to store produce and/or meat for weeks to months.
- **Cool, dry, ventilated storage** (around 10-16C, 60% humidity) – a basement usually works well for this, it can be used for drying out peppers or herbs, storing winter squash, potatoes, carrots, onions, garlic, etc.
- **Warm, dry storage** – for curing onions and garlic for a few weeks in the Fall

Further Reading

More information on cold storage

3.0 Soil Health

Understanding Soil

> *"Soil is what keeps everything in perspective in a garden. If you don't understand soil management, then you can have the best plants, but they are not going to grow right, because your soil conditions aren't right."*
> ***– Fred Fortier (Uncle Freddy's Hothouse)***

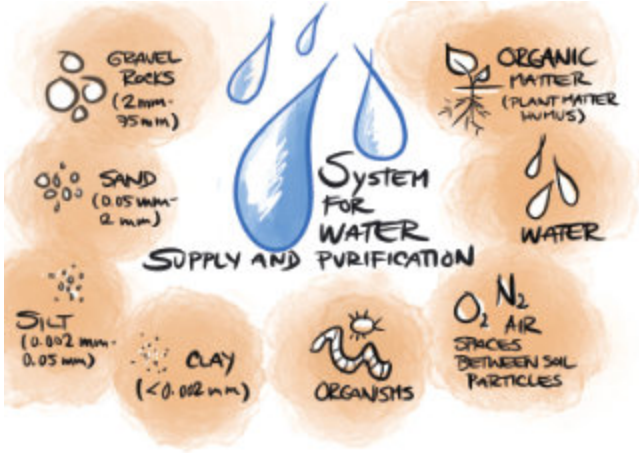
Soil is more than just dirt; it is a fascinating part of your farm that more organisms live in than another other part by far. A single teaspoon of rich soil can hold up to one billion bacteria, several yards of fungal filaments, several thousand protozoa, and lots of nematodes (see the Soil Food Web image below). Improving the health of your soil will ensure that plants and animals are growing well on your farm, and taking care of the soil will be worth your time and investment.

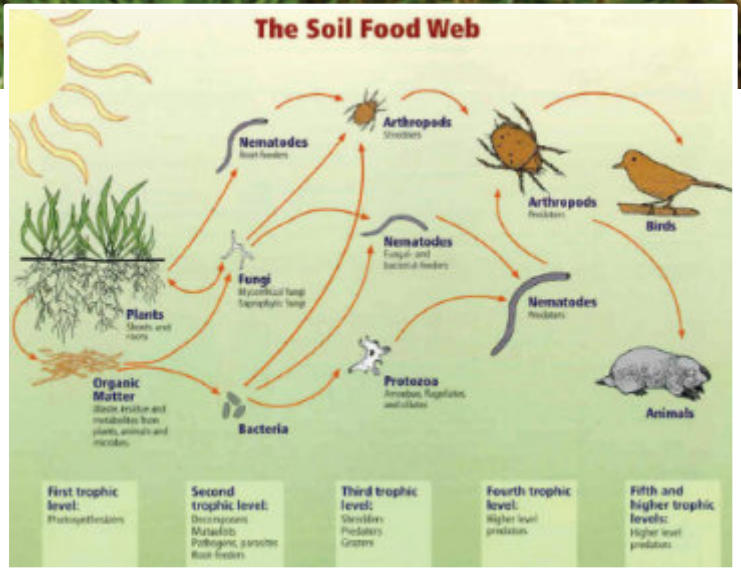
Fred Fortier holding some of the healthy soil at his farm

Soil health is made up of its physical structure, soil chemistry, and biology, outlined below in more detail. The basic components of soil are gravel, sand, silt, clay, organisms, air, water and organic matter.

Components of Soil Health:

1. Soil Structure
   (Sand, silt, and clay)
2. Soil Chemistry
   (Nutrients, minerals, and pH)
3. Soil Biology
   (Insects,
   fungus, and bacteria)
4. Organic Matter





Soil Structure (Sand, Silt, and Clay)
Soil is made of three basic parts: **sand**, **silt**, and **clay** which are different sized particles. To figure out the percentage of each in your soil, collect about 1 cup of soil (try to avoid gravel or sticks) and add it to a large mason jar with water. Shake the jar, and let it sit for at least 24 hours. You can see the height of each layer in the jar; leaves and debris will float to the stop, the sand will be at bottom as it is most dense (with the largest particle size of 0.05mm-2mm), then silt with medium density (and particles sized 0.002mm-0.05mm), and clay will be the top layer as it is least dense with the smaller particle size (<0.002mm).

Soil Chemistry
The three main nutrients in your soil that are important for plant growth are nitrogen (N), potassium (P), and phosphorus (K):

- **Nitrogen (N) –** Nitrogen is important for the growth of leaves on the plant
- **Phosphorus (P) –** Phosphorus is important for root growth, and the development of the flowers and fruits
- **Potassium (K) –** Potassium is a nutrient that helps the overall functions of the plant work well

There are also many other important micronutrients and trace metals will impact how plants grow. The image below has some examples of micronutrients and the impacts on human health; another reason to support local farmers to get all of the nutrients they need from good food!

pH is another important factor for growth, as some plants prefer particular acidic or alkaline conditions. The ideal pH for most crops is between 6 and 7, as you can see in the diagram below, so if your soil is an average of 6.5, that would be favorable for most crops. If your pH needs to be increased, you can add limestone to your soil which releases slowly over time. Make sure you are doing soil tests after each application to achieve your target pH.

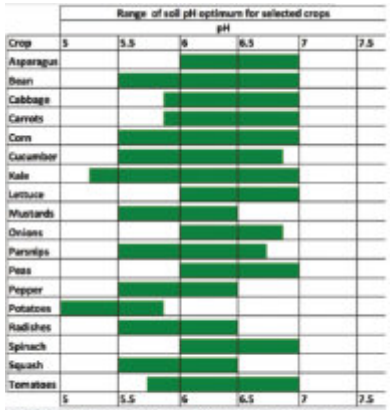


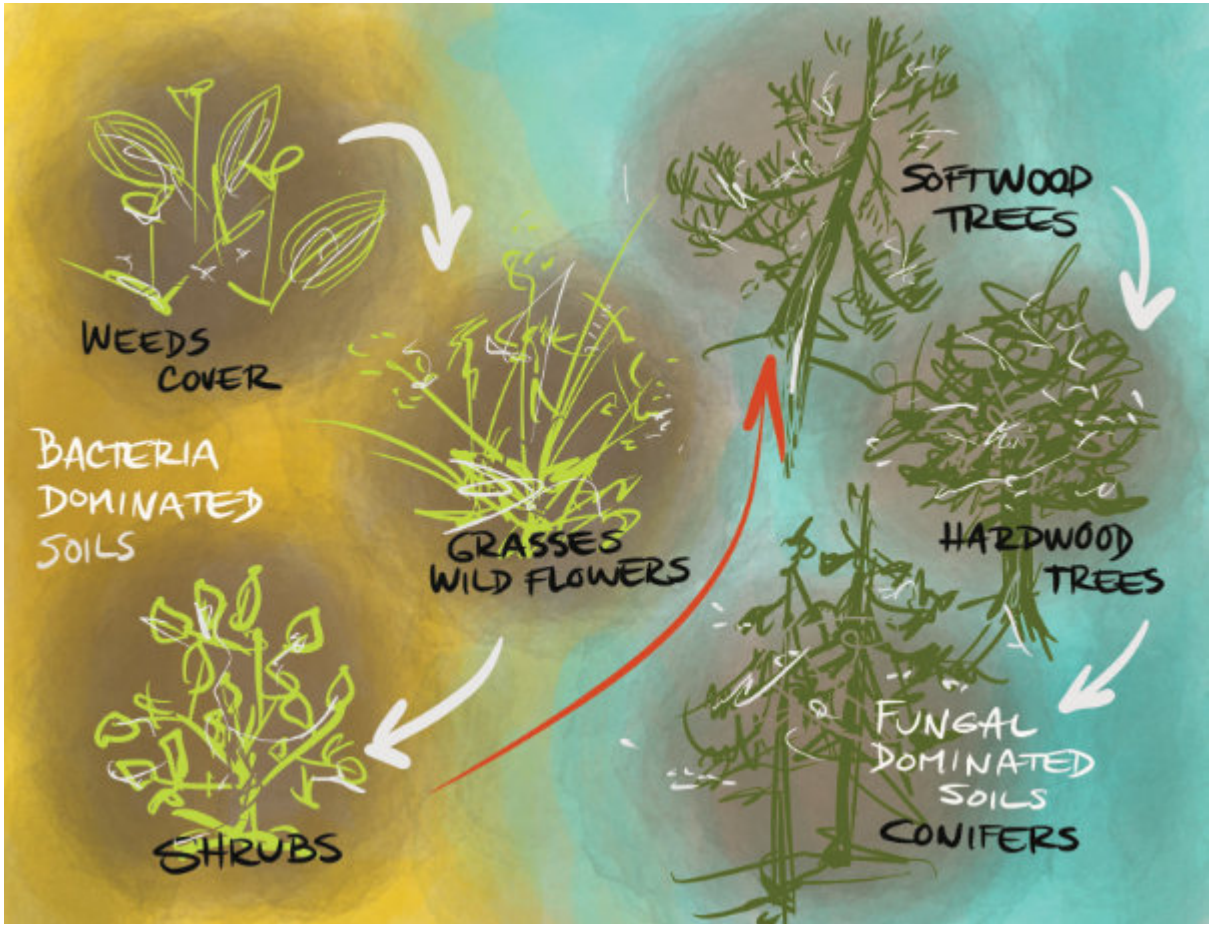
Figure 2 Optimum soil pH ranges for different vegetable plants. Adapted from Soil Fertility and Fertilizers: An Introduction to Nutrient Management, by J. Havlin, et. al., 7th edition.

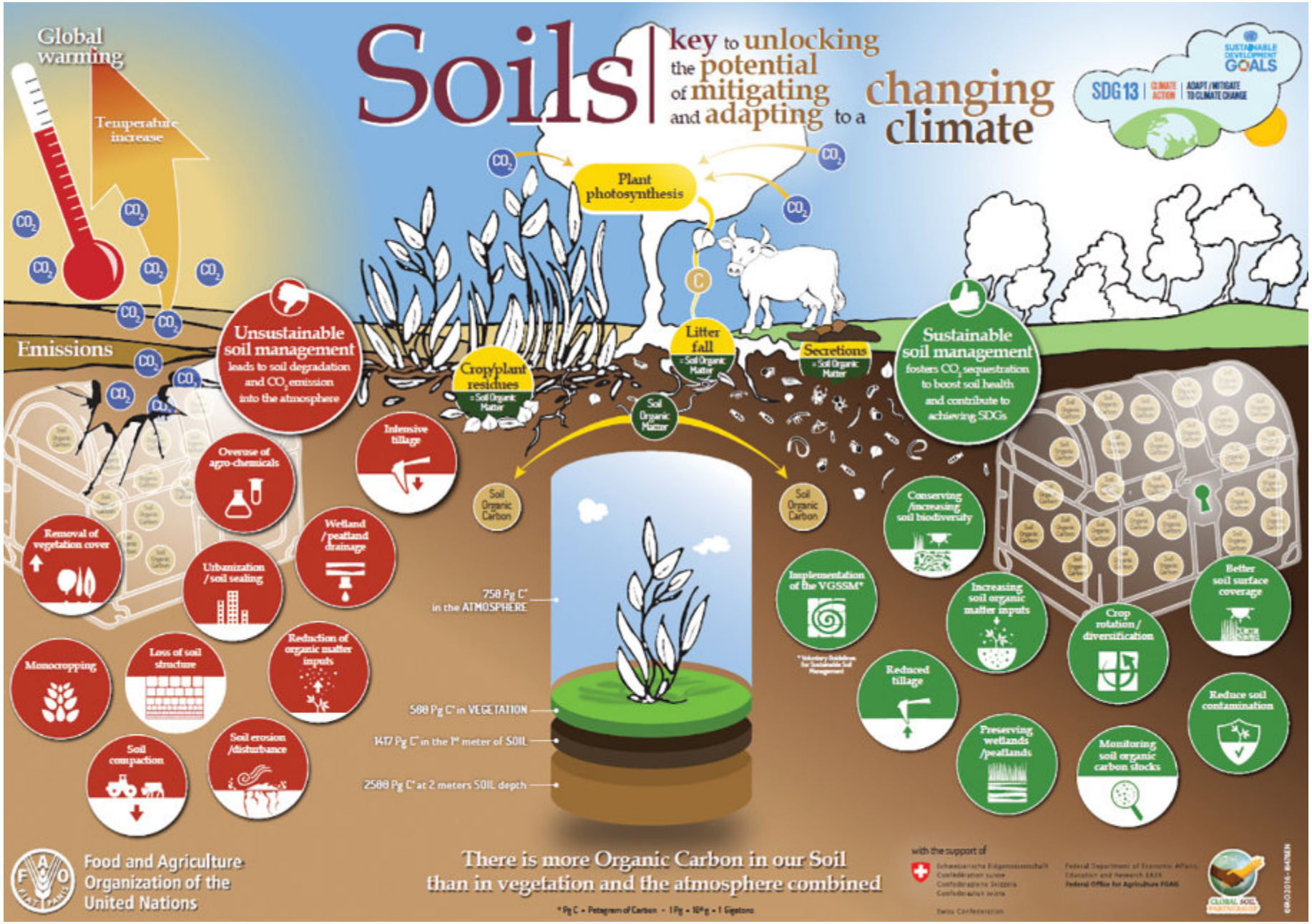
Soil Biology
The soil biology involves all of the organisms that live in the soil from bacteria to earthworms. Where your field is in succession (see the drawing below of a meadow transitioning to a forest) will tell you what kind of organisms live in it (bacteria vs fungus). Earthworms and beetles are easy to see, but the smaller bacteria and fungus plays a huge role in how well produce will grow in a field.

When you are assessing the site, consider where it is in its succession, a early succession grassland is bacteria-dominated, while the final succession phase of a forest is fungal-dominated (which the trees need for their mycorrhizal networks). When you plan your crops, consider what is there already and if you want to change what is growing there, you will have to add either bacteria or fungus to the soil. For example, planting a fruit tree in a lawn will not grow well if you don't add some soil from a forested area to the base of it. If you plant annual crops in a forest, they also will not grow well.

- **Fungal-dominated crops** include nut trees, fruit trees, fibre plants, and shrubs
- **Bacteria-dominated crops** include annual fruits and vegetables

> *"To introduce the fungus/bacteria that you need, you can go to a forest/meadow system and take a small amount of soil, and add it to the compost pile to inoculate it, and get the bacteria/fungus that you want to be growing. Using some of these practices, you can accelerate the natural systems so that within a shorter time you have a yield."*
> ***– Shelaigh Garson (Everyone's Eden)***




Soils
key to unlocking the potential of mitigating and adapting to a changing climate
SDG 13 | CLIMATE ACTION | ADAPT / MITIGATE TO CLIMATE CHANGE
Global warming
Temperature increase
Emissions
Plant photosynthesis
Unsustainable soil management
leads to soil degradation and CO2 emission into the atmosphere
Crop/plant residues
= Soil Organic Matter
Litter fall
= Soil Organic Matter
Secretions
= Soil Organic Matter
Soil Organic Matter
Soil Organic Carbon
Soil Organic Carbon
Sustainable soil management
fosters CO2 sequestration to boost soil health and contribute to achieving SDGs
Intensive tillage
Overuse of agro-chemicals
Removal of vegetation cover
Wetland /peatland drainage
Urbanization /soil sealing
Monocropping
Loss of soil structure
Reduction of organic matter inputs
Soil compaction
Soil erosion /disturbance
758 Pg C* in the ATMOSPHERE
588 Pg C* in VEGETATION
1417 Pg C* in the 1st meter of SOIL
2588 Pg C* at 2 meters SOIL depth
Conserving /increasing soil biodiversity
Implementation of the VGSSM*
Increasing soil organic matter inputs
Better soil surface coverage
Crop rotation / diversification
Reduced tillage
Reduce soil contamination
Preserving wetlands /peatlands
Monitoring soil organic carbon stocks
Food and Agriculture Organization of the United Nations
There is more Organic Carbon in our Soil than in vegetation and the atmosphere combined
* Pg C = Petagram of Carbon = 1 Pg = 10^15 g = 1 Gigaton
with the support of

Organic Matter

> *"You cannot control the percentage of clay, sand, and silt you have. If you have more organic matter, you have more aggregation and more pore space, which is more room for the microbes to grow and thrive, and more room for the roots to grow, and water will flow better. On the other hand if you have really sandy soil, the only thing you can do to slow that water down is to have organic matter, which is a sponge and hold onto the water for the plants. The answer is always sustaining that organic matter, which varies on temperature, water, and plant growth."*
> ***– Serena Black (Industrial Forestry Service)***

Organic matter is all of the carbon-based compounds that are present in your soil, which comes from plant debris, decomposed root systems, and is the top layer of your soil. The depth of the organic matter will vary from property to property, depending on what has been growing there recently, and how much soil was created over the previous millennia!

The percentage of organic matter in your soil will appear in soil test results. Soil stores an incredible amount of carbon, so keeping soils healthy is an important part of climate change mitigation as shown in the diagram on the opposite page.

To maintain and build organic matter, adhere to these soil health principles:

1. Keep soil covered (no bare soil, aka "soil amour") – discourages weeds and builds soil
2. Disturb soil as little as possible
3. Keep plants growing throughout the year
4. Encourage plant diversity (crop rotation, cover crops, etc.)
5. Integrate animals (or animal manure and tools to mimic them)

> *"Organic matter impacts the soil chemistry. If the material you are adding is a high in carbon, the nitrogen isn't available to the plants. If the material you're adding has a lower C:N, then you're getting the benefits of the carbon and organic matter (soil moisture, microbes, etc) but in a way that still leaves some nitrogen for the plants."*
> ***– Serena Black (Industrial Forestry Service)***

Organic matter can be built up in a number of ways, including making and adding compost (or compost teas or foliar sprays) with plant debris and food scraps from your farm and/or surrounding properties, adding peat moss, mulching crops, and feeding your soil organisms to continue building soil.

When measuring the quality of your organic matter (or any soil additions), consider the carbon (C) to nitrogen (N) ratio. This ratio is very important in building compost and adding anything to soil. If there is too much carbon (dried leaves, sticks, sawdust, wood chips) in the soil, the microbes will use the available nitrogen to break it down, leaving less available to the plants. Ideally, you want to add materials that have fairly equal amounts of C and N. For more information, read C:N in Cropping Systems.

> *"I added 13 truckloads sawdust to soil, which I later realized was way too much carbon for the soil, and all of the nitrogen went to breaking down the carbon, so nothing grew. But a few years down the road, I had beautiful soil."*
> ***– Dieter Dudy (Thistle Farm)***

Soil Assessment

Once you have your farm plan, think about your soils and where you will be farming on the property. Figure out your soil baseline so you know where you are starting from using the BC Soil Information Finder Tool (BCSIFT) tool; a step-by-step explanation on the right.

Dieter at Thistle Farm

ACTIVITY:

Figure out your soil baseline

1. Go to BCSIFT to learn about your property's soil.
   - Find your property by typing in the address or scrolling around the map to find it
   - Once you have found your property, click on the Agricultural Capacity tab on the left.
   - Left-click on your mouse the polygon that includes your property.
     - CC Label: Soil class and subclass
     - CC1 Class: Soil class
     - CC1 Subclass 1 / CC1 Subclass 2: Soil subclass(es)
   - Information on the soil classes: Soil class (number) and the subclass (letter) will give you a lot of information about the crops that will grow there, and the limitations you have on the soil.
2. What is the soil series?
3. What is my soil texture?
4. Determine the baseline (what it is right now).

After determining your soil baseline, find a company who will do a soil test, and collect your samples for testing. This will give you information about what the

nutrients are present (make sure you get samples from all over the property), if there are any heavy metals in the soil, and a lot more information.

Once you have an understanding of your soil, it will be easier to figure out what you need to do to improve the soil. There are so many management practices to increase your soil quality, and it all depends on the baseline. For example, you might have to build up the nutrients in your soil before you can grow crops. Remember that many soils in BC are new and young (it takes 100,000s of years to build soil!), so the soil often needs to be built (poor soils may not have been mismanaged, there just is not very much there).

Some examples of soil management practices are growing cover crops, green manure, and relay cropping to help build your soil (more in 3.1 Land Management Practices). These practices mimic natural processes, but speed them way up!

> *"Work with the characteristics of your soil to build it up, and so that you don't have to spend a lot of money adding inputs to it."*
> ***– Serena Black (Industrial Forestry Service)***

Soil Goals

Now that you have established your baseline, think about your soil goals.

ACTIVITY:

Make some goals for your soil

What are the goals for my soil?

- What do I want to be able to grow here? How will I build the soil so that I can grow what I want to?
- When do I want to be able to grow those plants?
- What are my resources (money, labour, manure, livestock, etc)?
- What are my equipment and tools on hand?

Further Reading

- Province of BC Agriculture and Soil Health
- BC Nutrient Management Calculator
- C:N Ratios in Cropping Systems
- This Steeped in Soil resource by 4H Canada explains soil health very clearly, and includes several soil tests and activities, including the Ribbon Test
- BCSIFT
- Soil Health principles
- The Market Gardener by Jean-Martin Fortier (p.53-79) – Lots of information about soil health and organic fertilization methods
- Regenerative Agriculture by (p.226-239) – Lots of information about compost

3.1 Land Management Practices

Soil Amendment Calculator

To help you figure out how many nutrients you need to add to your soil, you can use the BC Nutrient Management Calculator. Using the Calculator, you can add the previous year's cover crops, any compost/manure/fertilizers that were added, the results of the soil analysis, and it will calculate the nutrients you need for that particular crop.

For example, crops in one field of your farm are not growing very well. You have the soil test results, but are not sure what else you need to add to the field to improve the soil for the potatoes you want to grow there. Using the Calculator, you find that the chicken manure you added is not providing enough nitrogen, and exactly how much more you need to add to the soil for the projected yield of potatoes.

> *"Nature will always find its own balance, if we just let nature show us what needs to be done, we don't have all of these problems that need to be solved."*
> ***– Shelaigh Garson (Everyone's Eden)***

If you want to be create new beds, to really build the soil, it can take four years of planting various crops:

- **Year 1:** Plant potatoes (to condition soil)
- **Year 2:** Plant beans (to add nitrogen)
- **Year 3:** Plant root vegetables (aerate the soil)
- **Year 4:** Plant the desired crop!

Soil Management Practices

How can you build the soil?

1. **Cover crops**
2. **Mulch**
3. **Add manure / livestock**
4. **Compost**
5. **Weed management**

1. Cover Crops

Cover crops are those that are grown to build your soil which could worked into your annual crop rotation, or planted in the Fall after the crops are out and mowed/tilled in the Spring, and are also known as "green manure" as they have a lot of the same benefits as animal manure (both add organic matter, nitrogen, and carbon to the soil, and feed the soil organisms).

Fall Rye is a popular cover crop to plant in areas that you will be growing crops in the following Spring. Seed Fall Rye in the Fall, then in the Spring, once it is no more than 6″ high, mow or weed whack it down really low, leave the clippings on the soil (informally referred to as 'chop and drop'). Alternatively, after trimming down, you can fork it over and flip upside down, and let it break down for 6 weeks, thereby adding nutrients to the soil. You can also till it into the top 6″ of soil, but this can harm your soil structures and microbes, so only till when necessary. The ares cannot be planted immediately, it needs a few weeks to break down. Avoid planting Rye in areas where you are planting root crops.

Other cover crops include cereals like Oats, Buckwheat, etc. You can also mix legumes in like Peas, Beans, Soy, Alfalfa, and Clover to fix the nitrogen in the soil.

2. Mulch

One of the soil principles is to keep the soil covered, and mulch is something that you can use to prevent the soil from being bare. Keeping soil covered suppresses weeds, absorbs and stores water, protects soil, and decomposes into a valuable soil.

Living or green mulches refer to crops that are growing (e.g. cover crops) which work in pathways, in crop rotation practices, over the Winter, or preparing fields for future crops. You can also use many non-living materials as mulch including grass clippings,

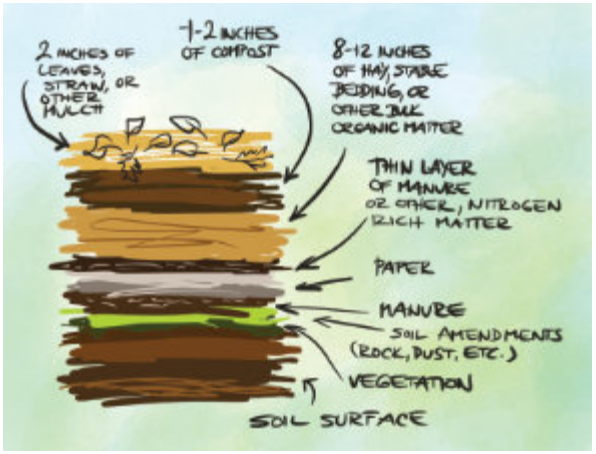
Fall Rye is sown in the Fall to be cut and flipped over in the Spring

straw (not hay), aged manure, weeds that have not gone to seed, wood chips, leaves and twigs, cardboard, newspaper, and more. Plastic mulch is used by many farmers in our area as well, which works very well to keep the soil moist and suppress weeds, but does not build organic matter or contribute to soil health.

If you need to build to build new beds, a technique called **layer mulching or lasagna beds**, using the resources you have already or are nearby. Alternate carbon (C) and nitrogen (N) layers in the beds; carbon-based ("browns", leaves, cardboard, straw, wood chips) and nitrogen-based sources ("greens", sod, manure, fresh leaves).

Layer mulching
To prepare beds for growing in lawn or bare soil:

1. In the exact place that you want to grow, cut out any pieces of turf that are growing.
2. **N: Flip the turf upside down** (roots up) – this has a lot of nitrogen and nutrients in it, so it does not need to be removed
3. **C: Cardboard or thick newspaper** on top of the areas you do not want grass to grow so it blocks out the light and adds carbon, make sure this to wet the cardboard after putting it down



4. **C: Wood chips** (mix of leaves in the branches, leaf mold, deciduous leaves and conifer, breaks down faster)
5. **N: Manure** (sheep, goat and llama are good to use fresh); aged manure (cow manure has few weed seeds; horse manure is good); really aged chicken manure (can burn the plants if used before two years)
6. **C: Spent straw** (bonus if there is feces, urine, has been rained on, and trampled on), wool works well too
7. **Soil** (may be purchased, great local soil is from Westwold View Farms, 15 yard minimum order)
8. Top dress with **C: Leaves** (it works well if they are chopped up with a lawn mower) or straw

3. Adding manure/livestock
One tool can be to integrate livestock, which is a large component of Regenerative Agriculture. If you are harvesting crops, you have to add nutrients back in, and it can be difficult to add enough nutrients from just plants alone (e.g. cover crops) if you don't want to add chemical fertilizers (these do not add organic matter and can really fluctuate in price and availability). If you don't have animals, you can buy local manure, which will add to the nutrients and organic matter in your soil. You are also working towards being self-sustaining; one of the benefits of diversification is creating your own inputs and not being as dependent on outside sources.

> *"Diversification will be more resilient, and better risk management, and if one thing doesn't work, than hopefully something else will. Changing one thing might change five other things down the line, like growing your own animal feed might have different percentages of protein than you are used to, and something might change for them."*
> ***– Serena Black (Industrial Forestry Service)***


Plastic mulch with straw in pathways


Greenhouse in November


Straw under plants and in pathways

4. Compost
Building an effective **compost system** at your farm is a big part of building up your soils, and returning nutrients back to the soil. Consider all of the produce that you can grow on your field and how much needs to go back into the soil (check out the BC Nutrient Management Calculator for more on this).

There is a lot of information on building and maintaining a compost system, but the basics are to add about two-thirds browns (C) and one-third greens (N), ensure it gets enough water, and mix it enough to prevent it from digesting anaerobically. You can inoculate it with microbes from a neighboring compost pile, or find some bokashi bacteria if you are interested. It can get quite technical to do it properly, and if you find that it is outside of your capacity, you can purchase commercial compost.

> *"Many First Nations communities are rural, isolated, and live outside big cities. How do you get rid of the compost and benefit your food sovereignty strategy? You collect it! A house of 6 people produces about 5 gallons of compost a week…after you figure out the compost produced by each family and each community…. Already, I collect 12 tons of compost a year, and all of that compost goes into my farm."*
> ***– Fred Fortier (Uncle Freddy's Hothouse)***

5. Weed Management
If you are using the **soil health principles** like having no bare soil, mulch, drip irrigation, and no or low-till practices, you are disturbing and watering the weed seeds as little as possible. You will always have weeds though! Here are some weed management tips from The Market Gardener.


Active compost pile at Uncle Freddy's Hothouse

Depending on your crops, there are different techniques for managing them including:

- **Tools** like a saddle or wire hoe are very useful for walking down the bed and weeding plants
- **Inter-plant crops** (e.g. planting lettuce in between cabbages so by the time the cabbage is ready in the summer the lettuce will have been harvested)
- Place **black silage tarps** in beds for 2-4 weeks to cover the soil to allow weeds to sprout then die, before planting the area with desired crop

Keep in mind that weeds are indicator plants of what your soil needs. For example, if you have a problem with Hairy Vetch, a nitrogen-fixing plant, then you know your soil is low in nitrogen. Another common example are Dandelions, which is a dynamic accumulator with a long taproot. Dandelions show up in compacted, poor nutrient soil (e.g. lawns); the long tap roots creates pathways for air and water, and mine nutrients that aren't available on the surface like magnesium, calcium, and boron. They pull these micronutrients to the surface, then store them in their leaves, and at the end of the season the leaves die, the nutrients are now available to other plants on the surface. They are pretty amazing!

> *"If you have a lot of one kind of weed, you can collect the weeds and make a compost tea with it, and water the ground with that weed, because it accelerates the job that that weed is trying to do, so you are giving the soil what it's asking for. If you have a dandelion problem, make a dandelion slurry; let it compost down, then foliar spray the area that you have the problem in, and it's making that nutrient readily accessible! Let nature do its thing."*
> ***– Shelaigh Garson (Everyone's Eden)***

Rotational Animal Grazing & Regenerative Agriculture

> *"The first time after the chickens went over the field, it looked terrible! I thought, "What are these people telling me to rotate my chickens on pasture, this looks terrible!"…Then clovers that came in that weren't even there before, the grass came back twice as green, you could see exactly where the chickens were and where they weren't."*
> ***– Dezmond Allen (Regenerative Pasture Systems)***

The practice of integrating livestock into your farm is often referred to as **Regenerative Agriculture**. The book *Regenerative Agriculture: A Practical Whole systems Guide to Making Small Farms* Work by Richard Perkins is an incredible resource if you are interested in learning more. There is also an overview of Regenerative Farming by Young Agrarians here.

Rotational animal grazing is essentially having animals out on pasture, and moving them every 1-3 days with portable electric fencing. It keeps the animals on a high plane of nutrition, and prevents overgrazing of the grasses. Not only is it good for the animals, but also the plants; the grazing encourages them to grow their roots, which stores more carbon in the soil, and feeds the soil biology.

After the animals have fed on the area, run the sprinkler over the pasture, and the manure will break down in no time, restoring the pasture.

> *"From the time a plant is bit, it takes about 3 days to start recovering, so you don't want animals to stay more than 3 days, as on day 3 it will start growing again; if the animal eats it again at day 3, then the plant is overgrazed. If you keep them in a smaller space, the animals will evenly graze the area instead of just eating the most delicious ones."*
> ***– Dezmond Allen (Regenerative Pasture Systems)***

Pastured poultry that move across the field

Till vs No-Till Practice

Tilling (or breaking up the soil) has been a common agricultural practice, but scientists are learning more about the impacts to the soil structure when tilling is done too frequently. Essentially, tilling with a tractor breaks up the soil and plants, aerates it, makes it easier for water to flow through and plant in. Unfortunately what also happens is that organic matter breaks down faster, and releases carbon into the atmosphere. Mechanical tillage also physically breaks up the structure of your soil, so you do lose some soil.

In BC, most of our soils are fungal-dominated (fungus grows in forest soils, while bacteria grows in grassland soils). The soil mycorrhizae are an important component of plant health; when the soil is tilled, these symbiotic relationships are disrupted. If the soil is not tilled, the soil will store more carbon, more organic matter will be be in the soil, the soil structure will be kept intact, and more of that mycorrhizae will grow and give nutrients with your crops.

> *"No-till doesn't mean that you NEVER do it, just use it when it is necessary. It will depend on your soil, your crops, and what is realistic for you and promotes plant growth (which may be every few years if the soil gets compacted). If the soil is tilled frequently, it does lead to long-term soil degradation."*
> ***– Serena Black (Industrial Forestry Service)***

How do you create the best environment for your plants to thrive? Depending on your soil texture, you might have to incorporate different tools along the way, including adding compost, planting cover crops, and mulching.

> *"If you want to store more carbon in the ground, remember that roots add more carbon than above-ground plants. If you are doing no-till but you don't have healthy plants in one field, and in another field you are tilling and have healthy, thriving plants, then you are probably storing more carbon in the ground in the field with the healthy plants and tilling."*
> ***– Serena Black (Industrial Forestry Service)***

Integrated Pest Management

When planting crops, you can plant flowers between your crops like marigolds, nasturiums, mint, sweet alyssum (especially around brassica to repel aphids), calendula, and more. This inter-planting technique works well to attract both pollinators and repel pests.

This helpful Integrated Pest Management guide was created for the Deh Gáh Got'ı̨ę Community Garden program by Shay Paul.

Dezmond feeding his cattle

4.0 Farm Enterprise Plan

Enterprise Plan

It is important to create an Enterprise Plan for each of the enterprises that you are interested in doing, the resources below will assist you in creating these.

> *"You can't subsidize an enterprise, you have to make sure the enterprise is sustainable. You have to break enterprises all apart and keep records all separate, otherwise the numbers are all messed up. For example, I lost this much money on my cow-calf operation this year, but my grass-fed beef made up for it. But if you lump them together, you don't know. This enterprise is barely making any money, but really, your grass-finished beef is making money, and the cows are dragging you down, so you have to adjust."*
> ***– Dezmond Allen (Regenerative Pasture Systems)***

ACTIVITY:

Create an Enterprise Plan for each enterprise

Use the New Farm Start-Up Guide (p.35-42), and work through the components of each enterprise budget:

1. Goals of the enterprise
2. Marketing plan
3. Production plan (materials and labour)
4. Human resources plan
5. Financial plan
6. Follow-up plan
7. Exit plan

Use these resources to guide you:

- Preparing a Business Plan: A Guide for Agricultural Producers
- Enterprise Budgets:
  - Kwantlen Polytechnic University has made a wide variety of enterprise budgets including by specific vegetable crops, livestock, and specialty crops.
  - Young Agrarians has a great blog and webinar on using enterprise budgets.

4.1 Greenhouse Production

A Calendar Year

This calendar was informed by Fred Fortier, Uncle Freddy's Hothouse (zone 5b).

> *"From April 1st to the end of October, I am here every day, there is no day off. You are here, every day. You are here at 8am, and here until 7pm if it's hot out closing things down."*
> ***– Fred Fortier (Uncle Freddy's Hothouse)***

Crops: Tomatoes, cucumbers, melons are the main crops in the greenhouse, and they are inter-planted with root vegetables, flowers (to attract bees), beans, fennel, onions, and garlic.

Planting methods: Use companion planting methods for plant health. You can also inter-plant as part of your Integrated Pest Management plan (e.g. to repel pests and attract insects who will eat your pests), and plant flowers to attract pollinators.

Season: 5b
The critical temperature for plants to survive is 10C, so when the ambient temperature in your greenhouse does not go below that, you can start planting. In a heated hothouse on March 1 start planting seeds, and in an unheated hothouse, on April 1 you can start planting seeds to sell as transplants that are ready to sell in 6 weeks.

Fred Fortier in his greenhouse in August

Greenhouse in November

Greenhouse Calendar

JANUARY/FEBRUARY:
- Order seeds, soil, trays, equipment if necessary

MARCH:
- Plant seeds in warm location (over 10C), starting with the ones with longer days to maturity starting around March 15
- Organize indoor supplies, fix any outdoor equipment weather permitting, etc.
- Greenhouses overheat easily, so make sure that soil stays moist

APRIL:
- Everything is planted from seed that will be grown in the greenhouse by April 1
- Water and care for seedlings

MAY:
- Once the seedlings are large enough, plant seedlings in the soil in the greenhouse
- Brassicas can planted in the ground around May 15
- If any seeds were started in the greenhouse, plant everything outside in the fields

JUNE
- Water, weed, maintenance, mulch, thin seedlings if necessary
- Harvest greens

JULY:
- Harvest garlic
- Water, weed, maintenance, mulch

AUGUST/SEPTEMBER:
- Water, weed, maintenance, mulch
- Harvest

OCTOBER:
- Harvest
- Every bed is planted with fall rye – no till method, chop it in squares, turn it over then plant into it

Value-Added Opportunities

Growing seedlings for sale in the Spring – Costs include trays, soil, seeds, and transportation

Key Resources

- Greenhouse Checklist
- BC Greenhouse Floriculture
- BC Greenhouse Vegetables

4.2 Market Garden

Crop Selection

> *"When choosing your crops, figure out what your five main crops are going to be. Don't start your farm with 15 varieties of peppers, try a couple and see what grows best. Grow the staple crops, and a few specialty crops, and then reflect on what grew well and what sells. Staples include potatoes, carrots, legumes (peas and beans). What is going to grow well on my farm? What is the labour needed for each crop?"* ***– Dieter Dudy (Thistle Farm)***

When choosing your crops:

- What are its soil and water requirements?
- Where are you going to grow it?
- How often does it need to be picked to keep growing well?
- How much labour does it need?
- How will I store it until it sells? How long does it take before it spoils?
- How/where will I sell it? Does the price and volume make it worth it? How much money am I going to make?

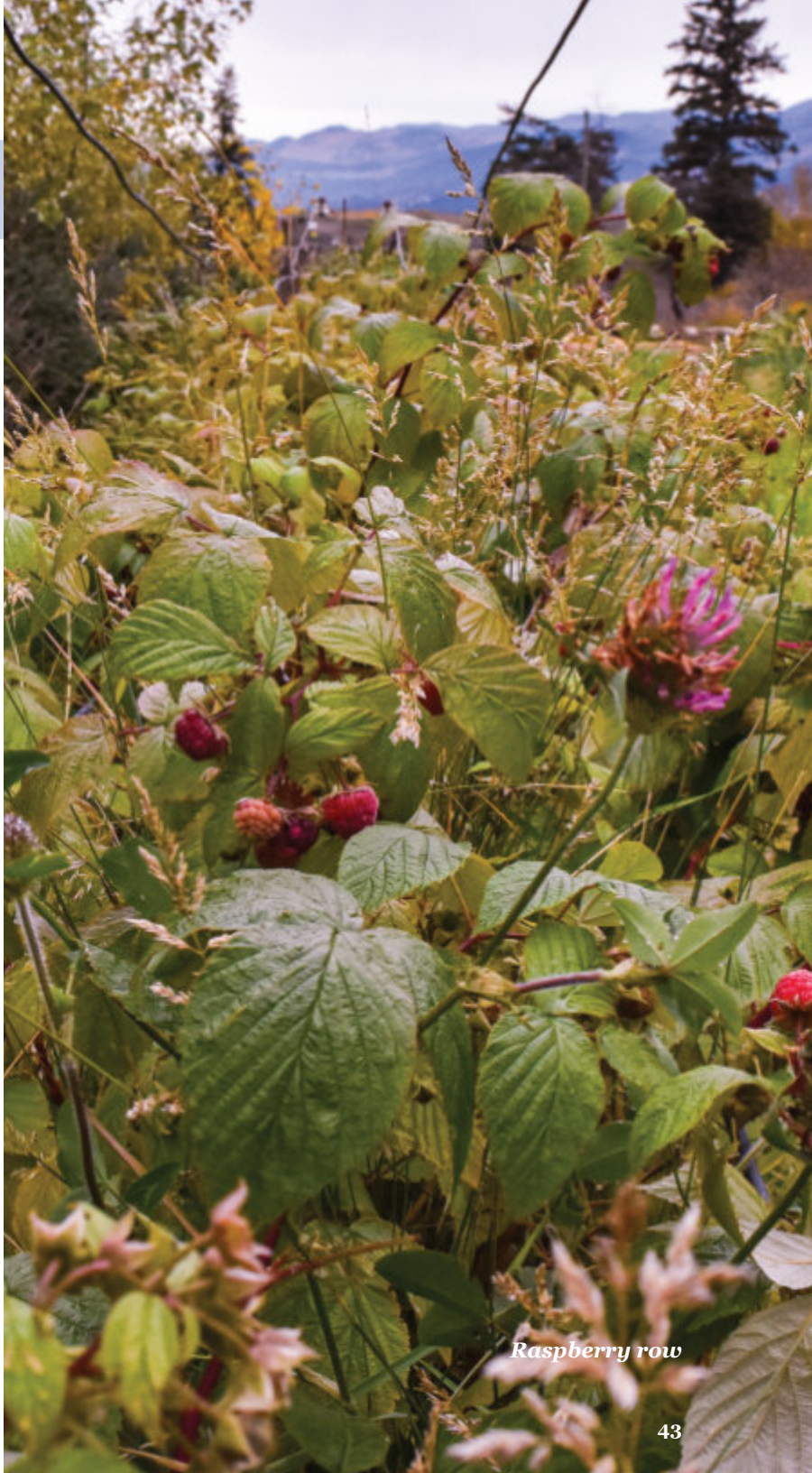
> *"Strawberries, garlic, raspberries, carrots, tomatoes are my main crops. I cannot be a monoculture farmer, you need some crop diversity, and think about what you want to sell. There might be some specialty produce that you sell for specific customers, like sprouts, ginger, or greens. Think about your customers and what their needs are."*
> ***– Fred Fortier (Uncle Freddy's Hothouse)***

Labor-intensive crops (these crops have high nutrient needs, do not store well, need to be harvested continuously to ensure high production):

- Raspberry row
- Berries (Strawberries, Raspberries, etc)
- Cucumbers, pickling
- Cucumbers, large
- Green beans
- Peas
- Summer squash
- Tomatoes, cherry
- Tomatoes, large

Lower maintenance crops (these crops have lower nutrient needs, store well, can be harvested multiple times or once and stored well):

- Beets
- Brassicas: Broccoli, kale, cauliflower, collard greens, cabbage
- Carrots
- Garlic
- Potatoes
- Winter squash



Raspberry row

Market Garden Calendar

This calendar was informed by Dieter Dudy, Thistle Farm (zone 5), Fred Fortier, Uncle Freddy's Hothouse (zone 5b) and Paula Cranmer-Underhill, Spapium Farm (zone 5).

JANUARY:

- Map the previous year in the fields – What worked? What didn't? Why? If something doesn't grow or sell well, plant it differently or don't grow it.
- Create a plan for the coming year of where everything will grow in the field, and plan your crop rotation.
- Create an inventory of all of the seeds from the year(s) before.
- Record the weight of the seeds you applied for the length of the row, this will help with seed ordering for future years.
- With your seed catalogs, write down everything you want to order. Then refer to your existing seed inventory, and update the seed order with what you still need to order.
- Place your seed order by January 31.
- Source your seeds:
  - Local seed producers
  - West Coast Seeds (BC)
  - BC ECO Seed Co-op (BC)
  - Pacific Northwest Seeds (Vernon, BC)
  - William Dam Seeds (Ontario)
  - Baker Creek Seeds (USA) – Heirloom

FEBRUARY:

- Clean and prepare the space where the seeds will be started (e.g. in the greenhouses).
- Order seeding soil, pots, manure, etc.
- Make any repairs to infrastructure (weather permitting)

Seed order at Thistle Farm

MARCH:

- As a benchmark, it is about six hours a day of work for 30 days to grow enough seedlings for five acres.
- Start seeding:
  - Onions, peppers (March 1)
  - Herbs
  - Tomatoes (mid-March)
- Get hoophouses ready to start planting in (where you will plant directly in the ground)
- Ways to plant your seeds:
  - Soil blocks from Johnny's Seeds or Lee Valley, 50 blocks per tray
  - Peat pots
  - In germination box (heat pad, steam) to keep things warmer
  - 48-cell trays, then transplanted to larger 3" pots
- Greenhouses overheat easily, so make sure that soil stays moist

APRIL:

- Plant in hoophouses (summer squash, carrots, beets, greens) once ambient temperature is at least 10C
- In fields, plant potatoes in the fields (mid-April)
- In fields, plant carrots, beets, radishes, kale, spinach, chard (3rd-4th week of April)

Seedlings at Thistle Farm

MAY:

- Direct sowing and planting seedlings outside in the fields
- All of the transplants planted in the fields by May 31
- Sell excess transplants
- Monitor your irrigation and fencing lines

JUNE:

- Harvest raspberries and strawberries
- Every two weeks, plant greens, legumes (peas/beans), and some root vegetables
- Weed, general plant maintenance
- Monitor your irrigation and fencing lines

JULY:

- Harvest raspberries and strawberries
- Every two weeks, plant greens, legumes (peas/beans), and some root vegetables
- As you harvest a crop, plant a new crop – e.g. when harvesting radishes, add compost or soil amendment, then a few days later plant the next crop
- Harvest garlic, plant fall rye in its place, and mulch
- Monitor your irrigation and fencing lines

AUGUST:

- Harvest
- Plant any Fall greens or Fall harvest crops, in the field or where you have row covers
- Monitor your irrigation and fencing lines

SEPTEMBER:

- Harvest

OCTOBER:

- Plant garlic
- Clear fields of weeds and crops (do before -10C)
- Cover with cover crop (e.g. fall rye)

NOVEMBER:

- Clear fields of weeds and crops (do before -10C) and mulch to cover the soil

DECEMBER:

- Paperwork
- Maintenance of machinery

Key Resources

- BC Vegetable Crop Production Guides – many specific crops are listed
- Vegetable Production Guide: Food Safety (Good Agricultural Practices) (PDF)
- Vegetable Production Guide: Grower's Record (PDF)
- Vegetable Production Guide: Nutrient Management (PDF)
- Vegetable Production Guide: Optimum Storage Conditions for Vegetables (PDF)
- Vegetable Production Guide: Pest Management (PDF, 1.2 MB)
- Tips from The Young Agrarians planning your market garden

Recommended Books

- The Four Season Farm and The Winter Harvest Handbook by Eliot Coleman
- The Market Gardener by Jean-Martin Fortier
- The Lean Farm by Ben Hartman
- Sustainable Market Farming: Intensive Vegetable Production on a Few Acres by Pam Dawling

4.3 Orchard

Orchard Systems with Guild Planting

A food forest has many stories of plants that produce yields for humans, and support each other with their pollinators, resources, and mimics natural ecosystems. Food forests are a big component of permaculture, and you can find a lot more information about it on websites and books listed below. There is evidence of historical **forest gardens** that have been found in BC planted by local Indigenous communities (listen here to the Future Ecologies podcast).

The **overstory** (main crop) of a food forest are the fruit/nut trees trees, with the **understory** (a companion/guild plant to plant under the main fruit crop). Common overstory fruit trees that grow in the Kamloops area are stone fruits, which include peaches, plums, nectarines, apricots, and cherries.

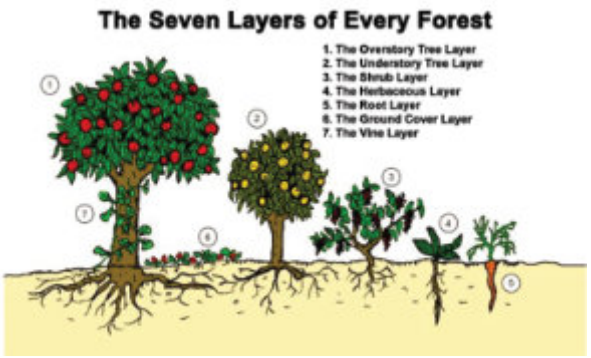
How can I choose what to plant under my fruit trees to create a **guild**?

What else is blooming around that time to attract pollinators?

- What pests are predominant during that bloom time? What plants can deter that pest? What plants will attract a predator to that pest?

- Is there a plant that I can grow and get a yield from them? E.g. garlic, currants, strawberries

You can also use a method called alley cropping under fruit trees, and grow vegetables or perennial crops (e.g. strawberries) under the fruit trees.



Credit: Permaculture a Beginner's Guide by Graham Burnett

Common **companion plants** under fruit trees:

- **Garlic:** repel pests and deer, and good yield
- **Daffodils:** repel deer, attract predatory wasps with early blooms
- **Comfrey:** compost accelerator, dynamic accumulator (bring up nutrients from deep in the soil)
- **Currants:** yield of fruit

> *"If I can get multiple yields out of a single system, then...YAY. Work smarter not harder. If you are planting flowers that attract pollinators that will attract ladybugs that will take care of your aphids, and you get a secondary yield out of it, even beauty, or a nice bouquet of flowers, or just balancing the ecosystem."*
> ***– Shelaigh Garson (Everyone's Eden)***

Further Reading

- The Holistic Orchard by Michael Phillips
- Listen to this Future Ecologies podcast about BC Indigenous forest gardens

4.4 Poultry

Layer Hens

> *“ Put the animals first, yourself second. Feed the animals before yourself in the morning.”*
> ***– George Casimir (Farm N Stuff)***

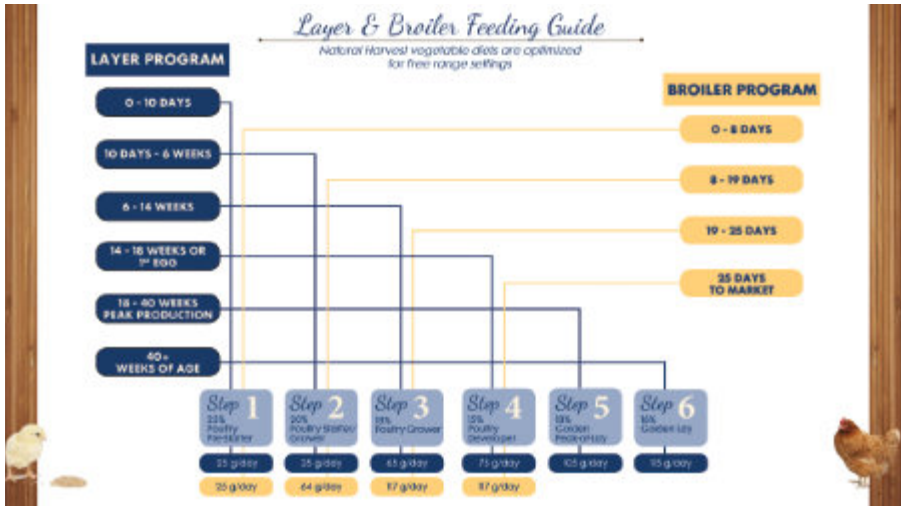
Chickens are the quintessential farm animal, and fresh eggs are hard to beat! Eggs are one product that your customers will buy on a regular basis from you, and help sell products from your other enterprises. Hens lay more eggs in the Summer than the Winter, so calculate how many dozen eggs you want to sell on average each week, or how many chickens you want to keep (or have space for).

When choosing an area for them to live, keep in mind that chickens will eventually eat all of the plants and scratch the ground so nothing will grow well if they are kept in the same space. They could be grazed on fields and moved into a coop for the Winter.

https://.bitly/3N8p3On

Equipment needed:

- ☐ Shelter (2-3 square feet of space per full-sized chicken in the coop) – includes nesting boxes, perches, wood shavings or other bedding for the floor, and sufficient square footage of space. This shelter can be stationary, or you can pasture your layers with an Egg Mobile, a moveable coop. They will need insulated/ heated space in the winter to prevent frostbite.
- ☐ Brooder space for chicks from 0-3 weeks of age – heat lamps, small feed troughs, chick waterers, thermometer, wood shavings, vitamin powder for their water, apple cider vinegar, and vaccinations for the chicks (you order them vaccinated or not)
- ☐ Outdoor space (8-10 square feet of space per chicken in the outdoor run)
- ☐ Waterer
- ☐ Feeder
- ☐ Feed (which changes depending on their age), oyster shells
- ☐ Egg cartons
- ☐ Refrigerator to store eggs



You can buy two-day old chicks from hatcheries in BC and Alberta, and pick them up at the post office. They are fine without food or water for a first few days of life as they have nutrients from their eggs, but they need to be given water and food as soon as you bring them home. In their water, add vitamin powder, and apple cider vinegar for the first two weeks. They don’t start laying eggs until they are 18 weeks old, so consider their feed costs before they bring in a profit.

As chicks, they will need to be kept safe in a brooder, similar to broiler chickens. Once their feathers have all come in about 6 weeks, then they can go outside more and will be safer in the elements.

They will lay eggs consistently until they are about 1.5 years old, then egg production decreases until they are about 6 or 7 years old when they stop laying. Egg laying is largely dependent on the length of the day, and most hens will stop (or decrease) laying when they receive fewer than 12 hours of daylight. You can add lights to the coop to mimic sunlight.

> *“ You need to give yourself a rest in the winter, maintain mental health, you need a break too. You get less of a break with animals. With chickens though you can give them a rest in the Winter if you also need a rest.”*
> ***– George Casimir (Farm N Stuff)***

Broiler Chickens

Raising Cornish Cross chickens for meat takes only 8 weeks from the time you get the chicks to the slaughter date. This short turn-around time works well for your cash flow, and you can time it well around the rest of your farm operations. In Kamloops, you can have 2 rounds of raising chickens, one in the Spring and one in the Fall. You can start them in April, ready in June, or starting in August and ready in October.

Be careful though, book your slaughter date BEFORE you buy the chicks from your local abattoir, then time it with the slaughter date. The delivery dates are very flexible, but the slaughterhouses book up early, so call in January to book the dates.

Layer hens in their run

Equipment needed:

- ☐ Shelter (2-3 square feet of space per full-sized chicken in the coop) – This shelter can be stationary, or you can pasture your broilers in a moveable shelter.
- ☐ Brooder space for chicks from 0-3 weeks of age – heat lamps, small feed troughs, chick waterers, thermometer, wood shavings, vitamin powder for their water, apple cider vinegar, and vaccinations for the chicks (you order them vaccinated or not)
- ☐ Outdoor space (8-10 square feet of space per chicken in the outdoor run)
- ☐ Waterers
- ☐ Feeders
- ☐ Feed, which changes depending on their age (see feed schedule above)
- ☐ Access to a local abattoir
- ☐ Refrigerator/freezer to store meat

You can buy two-day old chicks from hatcheries in BC and Alberta, and pick them up at the post office. They are fine without food or water for a first few days of life as they have nutrients from their eggs, but they need to be given water and food as soon as you bring them home. In their water, add vitamin powder, and apple cider vinegar for the first two weeks.

Once you know the slaughter date, you can market them early and pre-sell them, then you only have to refrigerate the chickens for a few hours until your customers can pick them up. If you need to store them for several weeks/months while you sell them, you can buy some fridges or deep freezers depending on your scale of production, then work your way up to large

scale refrigeration (e.g. a freezer trailer). People also like to buy them refrigerated (not frozen) so they can cut them up. The abattoir will only give you whole chickens, and without a commercial kitchen and food safety permit, you can only sell whole birds.

If you can find a butcher to prepare the meat, customers really like to buy boneless, skinless chicken breasts, which are sold at a much higher price per pound than whole birds, and might offset some of the costs of your operation. You will also need lots of freezer space if you are selling them in pieces, then you might have leftover legs or thighs.

> *"Figure out the selling price beforehand. Track how long it take to do the chickens, record a rough time of daily chores, total how many hours it takes, so you can figure out how much to pay yourself."*
> ***– Dezmond Allen***
> ***(Regenerative Pasture Systems)***

Brooder Phase/Chicks (0-3 weeks old)

- Chicks need to be kept at a consistent temperature, in a space with no drafts but also with some air flow. It can be tricky to figure out a space, so take detailed records to keep improving your system.
- If you choose, you can use a deep bedding system, and continually add more wood shavings as needed which becomes an anaerobic compost system and doesn't smell.
- Feed chicks continuously, or at least four times a day. In the water add vitamin powder, and apple cider vinegar for the first two weeks.
- After they are 3 weeks old (when most of their feathers come in), they can be moved outside

In the field (3-8 weeks old)

- Make sure the pasture space isn't too big, you might have a problem with predators.
- If you pasture them in a field, you can build "chicken tractors" (closed pens), or have them on open field and move them around with moveable, electrified poultry netting. While they are on the pasture, they need shelter. One option that Dezmond used was a Shelter Log Run-In shelter (12x20ft per 125 chickens) and used two for 250 chickens, put together shade and coverage for rain. A sprinkler was added on top of the shelter to keep them cool during the hot summer.

Turkeys

- Book your slaughter date in January with your local abattoir if you want to time your turkeys for Thanksgiving or Christmas dates. If you can market them early and pre-sell them, then you don't have to refrigerate/freeze the turkeys for more than a few hours until your customers can pick them up.
- Make sure they have lots of space to not convert it to bare land. Turkeys love living with chickens, as they both eat the same thing.
- Turkeys can range a bit in the orchard, eat weeds and bugs, and help the fruit trees too.

Further Reading

- BC Poultry Production Information
- BC Chicken Marketing Board – New Entrants
- Regenerative Agriculture: A practical whole systems guide to making small farms work by Richard Perkins

Dezmond's 250 pastured broiler chickens used two shelters (Regenerative Pasture Systems)

Turkeys

4.5 Food Processing

Food Processing

With excess produce, you can make value-added products with them! This could be drying, canning, or freezing. Some of these products might include:

- Dried herb bunches
- Garlic powder
- Hot pepper flakes
- Hot sauce
- Pickles
- Salsa
- Canned tomatoes
- Pickled beets

Remember that shipping is very expensive for canned goods, so direct sales to customers work best.

Many of these products require preparation in a commercial kitchen, or might be easier than your home kitchen. There are several local food hubs or commercial kitchens to make these value-added products in, for example at the Kweselkten Trailer (CFDC of CIFN), The Stir (Kamloops) or YeKm Food Hub (Lytton).

Salsa at Thistle Farm

Food Safety

For any product that is processed (e.g. not sold whole and uncut), you will need to complete a food safety plan.

Here are examples of Food Safety Plans. There is also a workbook that you can work through to develop your food safety plan. After developing your plan with the workbook, you can use this template to write your plan. After your plan is complete, you will need to submit it to Interior Health, or your local health authority if you are outside of Interior Health's region.

There are some training videos that provide a bit of an overview as well!

Further Reading

- Interior Health: Food Safety
- Interior Health: Food Premises
- CanadaGAP information – You need to need to CanadaGAP-certified to sell at large retail chains
- Small Scale Food Processor Association
- Local commercial kitchens:
  - Kwelsetken Kitchen Trailer (CIFN of CFDC)
  - The Stir (Kamloops)
  - YeKm Food Hub (Lytton)

Kweseltken Kitchen trailer

4.6 Seed Saving

*“Seed saving is a bit of a learning curve. Don’t get involved with seed saving the first year, you have to figure out what you are doing with your farm first. Grow some crops as a test to see if seed saving appeals to you. The next year try it again, and start learning more about it. By your third year of farming, if you still like it, and you have the staff (depending on how big your farm is), then you can get more into seed saving.” – **Daniela Basile (SSOL Gardens)***

Learn to Save Seeds

Saving the seeds from productive plants on your farm can be a wonderful way to save money on seeds for following years, select for certain traits, and have crops that grow well on your property. If you are considering saving seeds, find information (like this Seed Matters – seed saving chart) about how spaced apart the plants need to be (they might cross if they are too close together), figure out which crops are in the same family and need to be spaced apart, if the plants are annuals or biennials, and choose open-pollinated seeds to use for seed saving (hybrid seeds will not be true to what you grew).

These are a few **annual crops** that are a bit easier to save seeds from:

- **Beans/peas** – after harvesting what you need, let some beans/peas dry out on the plant and collect them.
- **Broccoli** – let it flower and go to seed, collect seed pods
- **Cilantro** – after it bolts, let it go to seed, collect stalks
- **Lettuce** – if you see it about to bolt, let it go to seed (see below for photos)
- **Tomatoes** – save your favorite tomatoes and soak the seeds in water for a few days then let dry

Example: Lettuce

Of the lettuce that you’re growing, if you find there is one group of lettuce that is growing really well, let 2-3 plants go to seed; one would do, but a few is better. You can still harvest the rest of the plants. Take that seed, and let it dry. Then the next year, grow out the lettuce seed.

Lettuce that went to seed

If you grow seed for yourself, you don’t need to worry so much about varieties crossing with each other. You will also save money on your seed order every year, and have crops that grow well on your farm. If you are growing it for yourself, it doesn’t matter if it crosses.

Separating the seed from the chaff

Biennial crops: Beets, carrots, celeriac. You can dig up the root crops (to make sure that they are not planted close to a crop of the same family, e.g. beets are related to chard, so they need to be planted far apart, but beets and carrots can be planted together), and plant them together in a new seed saving row.

Store the lettuce seed

Example: Carrots

Carrots are biennials, which means they go to seed in their second year. If you had carrots that did very well, you can let 4-5 carrots go to seed, and either let them keep growing, or move them into a special seed saving row so that they are not harvested by accident. In the second year, collect the seed!

SSOL Gardens seed display

Grow Seed to Sell

“It depends if you are doing it for yourself or if you are doing it to sell. You want to get as much different genetics going into your plants as you can, and that’s what leads them to be sustainable, to grow better in the climate that you’re in. As long as you keep rotating and keep that genetic integrity intact, you can continue to produce for years and years.”
– Daniela Basile (SSOL Gardens)

If you try seed saving for a few years and you would like to start an enterprise selling seeds, you will need to make a careful planting map for your field. After you choose the crops that you are saving the seed from, make sure that vegetables are planted far enough apart so that plants don’t cross. Only use open-pollinated seeds, as hybrids will produce offspring that will not be true to the parent.

There are two ways to plan your production of seeds; one is to focus on producing a large quantity of seed of a few


SSOL Gardens
Mediterranean Oregano
SSOL Gardens
Tango Celery
Large vigorous plants with excellent flavour, sweetness and crunch. Springless stalks that grow well even in our hot summers.
Open pollinated 90 days
Organic British Columbian
Assorted Dried Chillies
SSOL Gardens
Seasonal, Sustainable, Organic, Local
SSOL Gardens
Hot Paprika Mix
Smoked and Spicy ground paprika Peppers. Use in dips, spice rubs. Add flavour to vegies and savory dishes

crops, saving them for a few years to sell, and the second is to grow smaller amounts of several crops every year. Consider that you will need to take detailed records of the year each seed was produced, as your customers will want seeds with a high germination rate (which you can test the percentage of by sprouting 10 seeds, e.g. if 8 seeds of 10 sprout, you can estimate a germination rate of 80%).

Another thing to consider when starting a business is how long the seeds last. For example, carrot seeds will last 6 years, while the germination rate of onions and chard is already lower by year 2, and is too low by year 3.

Kamloops Community Seed Library

The Kamloops Food Policy Council runs a community seed library, where you can borrow or donate seed from. "During planting season, members take out seeds from the library and grow them. They save seeds from the plants they grow and hopefully at the end of the season, return more to the library than they initially took, thereby helping to build the collection."

They also own a winnower and thresher that is available to people who have large amounts of seeds to save! Contact them for more details.

Seed Saving Resources

- Seed Savers Exchange – How to save your own seed
- How to Save Your Own Seeds By Diane Joubert & Bob Wildfong
- Seed Matters – Seed saving chart with plant spacing and pollination
- Saving tomato seeds // Lettuce // Bean and Pea
- Bauta Family Initiative on Seed Security


PURE & NATURAL
HONEY
UNPASTEURIZED
Liquid Honey 350 g
$ 6.00

5.0 Marketing

Marketing

> *"Just because you can grow vegetables, doesn't mean you can market them."*
> ***– Dieter Dudy (Thistle Farm)***

When planning which crops to grow, consider your market and how you are going to sell them. If you are growing a large quantity of a few types of crops, selling to grocery stores might be a good strategy, though they will be interested in wholesale prices. If you are selling through a CSA or the farmers' market, you can sell whatever you have ready that week, and have more flexibility, though it is more work to sell.

> *"Your reputation is so important. We as gardeners give away enough as it is, you are always giving things away. If people try to get a deal, make sure you get a fair price. You are not going to make a lot of money. Your marketing strategy will depend on your geography, growing conditions, the location of your farm, everything. Know what your constraints are before you start growing; try to find a local place to sell your crops at, otherwise it can be really tough if you have to drive far away to sell your crops." –*
> ***Fred Fortier (Uncle Freddy's Hothouse)***

Communication Channels

Part of your marketing strategy will be how you communicate with your customers. People love seeing photos and videos of your farm and want to follow along on your adventure. Having an up-to-date website, and social media channels (Facebook and Instagram, perhaps Twitter and TikTok) will help build your customer base and let customers know what they will be able to purchase even before they get to the market or farm stand.

> *"There is a value for buying at the right price from your local farmers, rather than going to a grocery store and saving ten bucks, when you could just be supporting the local farmers!"*
> ***– Paula Cranmer-Underhill (Spapium Farm)***

At the end of the day, being a farmer and selling your produce is all about building relationships with your customers; you can do that by greeting shoppers at the market, saving the chef's favorite squash for them, or having some produce to give away as samples. It is a lot of work to grow vegetables and raise animals, but the other side of that is ensuring you have customers for them!

> *"At the end of the year, think about what sells. If it doesn't sell, then don't grow it."*
> ***– Fred Fortier (Uncle Freddy's Hothouse)***

Further Reading

- Young Agrarians blog on marketing
- CFDC of CIFN business resources
- The Market Gardener by Jean Martin Fortier

Dieter happily setting up for the market

Vendors setting up for the Kweseltken Farmers' and Artisan Market

Beautiful Spapium Farm display

Bunches of herbs at Thistle Farm

Friendly customer service

5.1 Direct to Customer

Selling at the Farmers' Market

> *"Make your stall look like how you feel."*
> ***– Paula Cranmer-Underhill (Spapium Farm)***

Factors to consider:

- The **BC Farmers' Market Nutrition Coupon Program** has coupons in increments of $3; one idea is to bunch things in bunches in $3 increments to make ti easier for customers to use their coupons.

- **Customer service –** Always be engaged with your customers, greet everyone who walks by, and try to remember names and things about people. Also try to keep your phone away and stay standing as much as possible. You want everyone who comes to your table to leave feeling better than when they came. A little goes a long way!

- **Display –** Have an appealing farm sign, clear prices, clean scale, a cashbox with sufficient change, clean tablecloths, and take advantage of seasonal decor (e.g. corn stalks in the Fall). Have big baskets or nice boxes to display your produce in, or even flowers on the table. Your reputation alone won't sell the products!

- **Distance from your farm –** Consider how far the market is from your farm, the cost to get there, and how much produce you can actually sell there.

- **Packaging –** Simplicity goes a long way. Consider how each product will be sold, either by weight, or as units (e.g. selling carrots at $3/lb or in $3 bunches at 1lb). Certain crops might sell better if set out in boxes of 10lb (e.g. pickling cucumbers). If bunching/prepackaging, pack vegetables by similar size for ease of cooking, and always include a minimum of 3-4 vegetables (e.g. carrots or onions). As crops grow larger, increase the price/weight of bunched products. For large crops like pumpkins, lower the weight price so that the final vegetable isn't too expensive.

- **Produce –** Your product should be pristine, clean, visually appealing, and arrange crops of alternating colors on the table. Keep produce out of the sun as much as possible; keep your produce in the shade, and have ice or coolers to store excess produce under the tables or nearby.

- **Product knowledge –** Consider the end user. When growing new vegetables, always eat them yourself first so you know what they taste like and have some recipe ideas to inspire customers for each item. For example, when growing several varieties of potatoes, ask customers what they are going to use them for so you can direct them to the best potato for their recipe.

- **Shade –** Bring your own tents, also have cloths to attach on the side of the tents for more shade. Store excess produce in the bins under the tables or in the shade.

- **Signage –** Have nice sign with your farm name, address, and any unique growing practices (e.g. organic or regenerative) on it, and have clear prices on each item.

> *"Always think about what produce you can give away, and get people to try new crops. We call that potlatching with our produce."*
> ***– Paula Cranmer-Underhill (Spapium Farm)***

Selling through a Community Supported Agriculture (CSA) / Good Food Box (GFB)

> *"We stopped doing deliveries far away because produce wouldn't look good by the time it arrived, if it wasn't stored in a cooler. Then went to people having to come to the farm to picking up their box."*
> ***– Paula Cranmer-Underhill (Spapium Farm)***

- Ensure there is enough crop variety throughout the year to supply weekly boxes.
- A GFB is a good way to access Elders and others who don't go out to the market, and most First Nation communities have a food delivery service.
- When planning deliveries, so much of it is about timing; people do not like wilted produce, so crops need to be kept cool. Store the boxes in the fridge as long as possible, then do deliveries early in the morning, and store boxes in coolers in the delivery vehicle.
- When starting out a CSA program, you can do a market survey to find out who might be interested on your website, and what they would like to order, frequency of deliveries, and any other products that might be included (e.g. recipes or products from other farms). Then you can connect with the people who said they were interested to ask for orders.
- A box system needs to have a predictable schedule that boxes are dropped off at homes, or pick ups from the farm are scheduled. Be clear with customers what happens when they don't pick up their box (will you keep it for 24 hours?). Encourage them to have someone else pick it up for them if they are not able to.

Local Farmers' Markets

- Kamloops Regional Farmers' Market
- Kweseltken Farmers' & Artisan Market

Spapium Farm display

5.2 Wholesale

Selling to Restaurants

> *“You have to enjoy being a foodie. The reason we have such a good rapport with restaurants, is that I like talking to the chefs. I ask them, “How do you prepare it? What are you going to do with it?” Then I know what size of things they want. I always give them samples so they see what it looks like.”*
> ***– Daniela Basile (SSOL Gardens)***

Chefs can be really creative with food, and it is important to establish a personal relationship with the chefs; if you like to cook too, let them know a delicious way that you prepared the food. You can save the sizes of produce they like (for example the very small patty pan summer squash or thin carrots) for them, and check in about the previous week’s delivery. Was everything in good condition? Make sure to replace any produce that was not suitable. Did everything taste good? What is coming up on the menu? If you get in a habit of communicating often with the chefs, then when you grow something that turns out a bit unexpected, talk to them in advance and let them know how something grew, and possible ways they could prepare it.

When delivering food to a restaurant, make sure the produce is VERY clean so chefs can use it immediately. Bacteria can grow in dirt, and the kitchen needs to be a very clean place.

Watch this YouTube video for more tips! Farm to restaurant marketing presentation.

You could also partner with a local caterer to use your produce in their catering events, or host event on your farm (partner with a caterer or chef is cooking is not your skill set).

Selling to Food Stores

Selling to food stores can be tricky, as they often want to dictate the price and the payment date, which can be as long as 90 days later. If you are certified organic, Nature’s Fare will often buy from local producers. Larger food stores like Save On will also buy at wholesale prices, but need large quantities of a few items. There is more information on this Young Agrarians page about selling to retailers.

RESOURCE LIST

Food Sovereignty
- Seed Change
- Planning for Food Security Toolkit (FNHA)
- Indigenous Food Sovereignty

1.0 Business Planning
- Farm Business Planning Workbook For The Beginning Farmer
- CFDC of CIFN Business Plan Workbook
- Taking Stock website
- Small to medium-sized farm start up guide
- BC Government – Starting a new farm
- Indigenous Tourism BC
- North Okanagan Organic Association
- Organic BC
- Agriculture Emergency Preparedness Workbook
- Organizations to reach out to:
  - CFDC of CIFN – Business resources
  - Sto:lo Business Association
  - BC Young Farmers Association
  - Young Agrarians
  - Vancouver Urban Farming Society
  - Farm Folk City Folk
- University programs:
  - University of the Fraser Valley – Agriculture Center of Excellence
  - Kwantlen Polytechnic University – Agriculture
  - Thompson Rivers University – Sustainable Ranching Program

1.1 Land Assessment
- BC Land Matching Program by the Young Agrarians
- The Market Garden
- BC First Frost Dates
- BC Last Frost Dates
- Plant hardiness zones
- West Coast Seeds: South Central Planting Chart
- Young Agrarians Transition Toolkit

1.2 Mentorship and Learning
- COABC and BCAFM
- BC Agriculture Council
- Chase Farmer's Institute
- TRU Sustainable Ranching Program field trips

2.0 Property Design
- Legal property lines (the City of Kamloops map)
- Principles of Permaculture website
- Verge Permaculture: Website and YouTube channel
- The Permaculture Handbook: Garden Farming for Town and Country by Peter Bane
- Gaia's Garden: A Guide to Home-Scale Permaculture by Toby Hemenway
- Regenerative Agriculture: A Practical Whole Systems Guide to Making Small Farms Work by Richard Perkins

2.1 Farm Labour
- WWOOF
- Young Agrarians

2.3 Structures, Tools, and Fencing
- The Market Gardener page

2.4 Crop Storage
- More information on cold storage

3.0 Soil Health
- Province of BC Agriculture and Soil Health
- BC Nutrient Management Calculator
- C:N Ratios in Cropping Systems
- This Steeped in Soil resource by 4H Canada explains soil health very clearly, and includes several soil tests and activities, including the Ribbon Test
- BCSIFT
- Soil Health principles
- The Market Gardener by Jean-Martin Fortier (p.53-79) – Lots of information about soil health and organic fertilization methods
- Regenerative Agriculture: A Practical Whole Systems Guide to Making Small Farms Work by Richard Perkins (p.226-239) – Compost

3.1 Land Management Practices
- BC Nutrient Management Calculator
- Regenerative Farming by Young Agrarians
- Integrated Pest Management guide

4.0 Farm Enterprise Plan
- New Farm Start-Up Guide
- Preparing a Business Plan: A Guide for Agricultural Producers
- Kwantlen Polytechnic University – enterprise budgets
- Young Agrarians has a great blog and webinar

4.1 Greenhouse Production
- Greenhouse Checklist
- BC Greenhouse Floriculture
- BC Greenhouse Vegetables

4.2 Market Garden
- For a sample crop planning calendar
- Soil blocks from Johnny's Seeds or Lee Valley
- BC Vegetable Crop Production Guides – many specific crops are listed
- Vegetable Production Guide: Food Safety (Good Agricultural Practices) (PDF)
- Vegetable Production Guide: Grower's Record (PDF)
- Vegetable Production Guide: Nutrient Management (PDF)
- Vegetable Production Guide: Optimum Storage Conditions for Vegetables (PDF)
- Vegetable Production Guide: Pest Management (PDF, 1.2 MB)
- Tips from The Young Agrarians planning your market garden
- The Four Season Farm and The Winter Harvest Handbook by Eliot Coleman
- The Market Gardener by Jean-Martin Fortier
- The Lean Farm by Ben Hartman

- Sustainable Market Farming: Intensive Vegetable Production on a Few Acres by Pam Dawling

4.3 Orchard

- The Holistic Orchard by Michael Phillips
- Listen to this Future Ecologies podcast about BC Indigenous forest gardens

4.4 Poultry

- BC Poultry Production Information
- BC Chicken Marketing Board – New Entrants
- Regenerative Agriculture: A practical whole systems guide to making small farms work by Richard Perkins

4.5 Food Processing

- Examples of Food Safety Plans, a workbook, you can use this template to write your plan
- There are some training videos
- Interior Health: Food Safety
- Interior Health: Food Premises
- CanadaGAP information
- Small Scale Food Processor Association
- Local commercial kitchens:
- Kwelsetken Kitchen Trailer (CIFN of CFDC)
- The Stir (Kamloops)
- YeKm Food Hub (Lytton)

4.6 Seed Saving

- Seed Matters – seed saving chart
- Kamloops Food Policy Council runs a community seed library
- Seed Savers Exchange – How to save your own seed
- How to Save Your Own Seeds By Diane Joubert & Bob Wildfong
- Seed Matters – Seed saving chart with plant spacing and pollination
- Saving tomato seeds // Lettuce // Bean and Pea
- Bauta Family Initiative on Seed Security

5.0 Marketing

- Young Agrarians blog on marketing
- CFDC of CIFN business resources
- The Market Gardener by Jean Martin Fortier

5.1 Direct to Customer

- Kamloops Regional Farmers' Market
- Kweseltken Farmers' & Artisan Market

5.2 Wholesale

- Farm to restaurant marketing presentation
- Young Agrarians page about selling to retailers

Dear Reader,

Community Futures Development Corporation of Central Interior First Nations would like to send out a special appreciation to so many people and organizations in helping us develop this guide. We set out to provide an easy step by step document for aspiring and existing farmers to use, as well as youth and communities.

Thank you, Adrienne de Candole and Marie Bartlett, in all your hard work developing this inspirational document.

Thank you also to all the farmers that we interviewed, thank you to our funders from Pan Pacific and the Rural Opportunity Fund, and especially all our Elders who contributed their knowledge, without you all the valuable information contained within would not have come together in this beautiful document.

Good luck on your farming journey!

George Casimir
General Manager, CFDC of CIFN

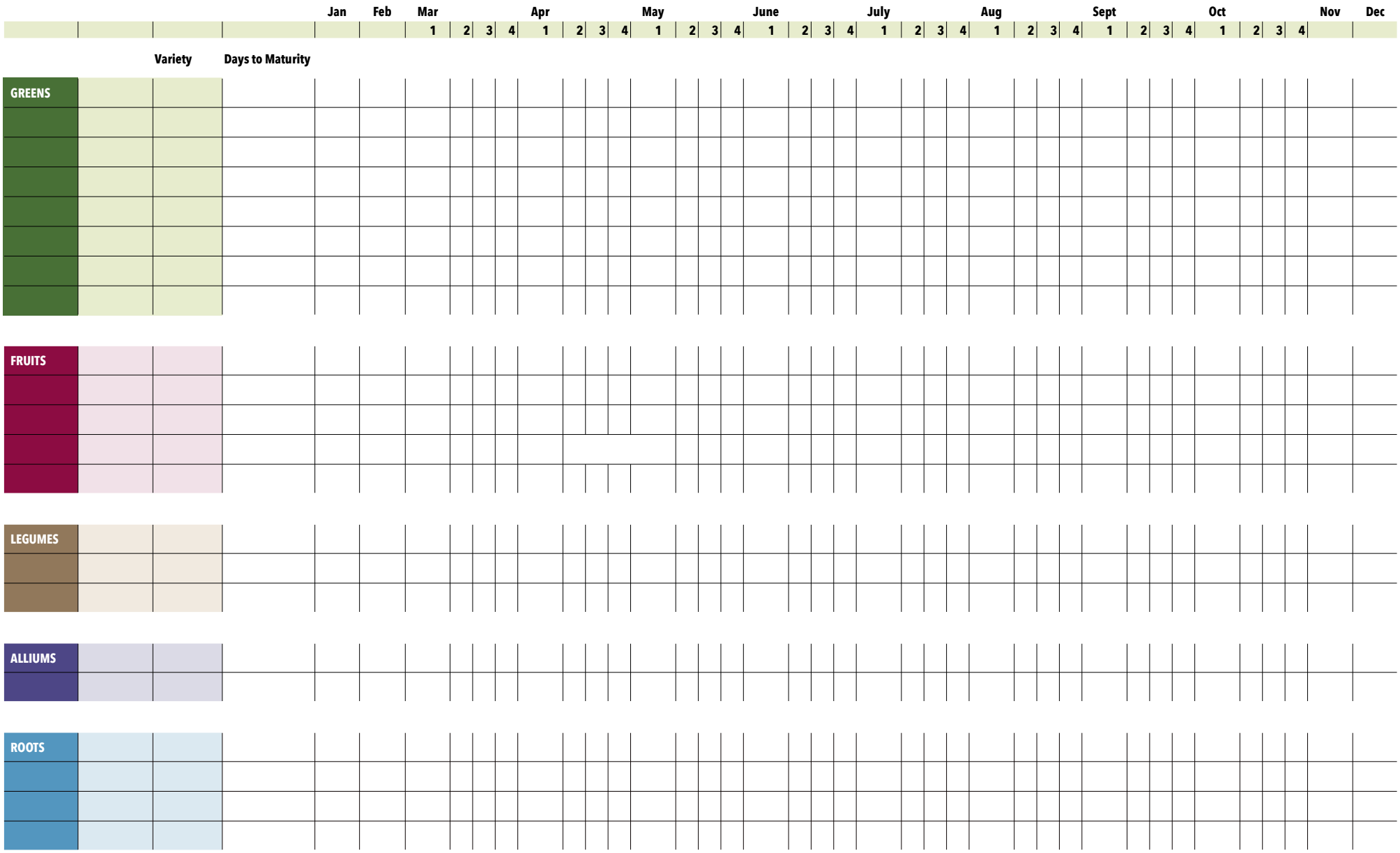
Kweseltken Crop Planting Calendar (Growing in Zone 5)

INDOOR SOW (IS)
DIRECT SOW (DS)
TRANSPLANT (T)
HARVEST (*)

		Variety	Days to Maturity	Jan	Feb	Mar 1	Mar 2	Mar 3	Mar 4	Apr 1	Apr 2	Apr 3	Apr 4	May 1	May 2	May 3	May 4	June 1	June 2	June 3	June 4	July 1	July 2	July 3	July 4	Aug 1	Aug 2	Aug 3	Aug 4	Sept 1	Sept 2	Sept 3	Sept 4	Oct 1	Oct 2	Oct 3	Oct 4	Nov	Dec
GREENS	**Spinach**	Olympia	45											DS						*	*																		
																DS						*	*																
	Lettuce, head	Buttercrunch	67						IS					T				*	*																				
	Lettuce, leaves	Mixed	30 to leaves							IS				T				*	*																				
														DS						*																			
																DS						*	*																
	Kale	Red Russian	65							DS								*	*			*	*																
												DS								*	*																		
FRUITS	**Tomoatoes**	Red - Early girl	57			IS										T										*	*	*	*										
		Cherry - Sweet Million	62			IS										T													*	*	*	*							
	Squash, summer	Zucchini, Black Beauty	60					IS				T						*	*	*	*	*	*																
											DS (hoop house)							*	*	*	*	*	*																
	Squash, winter	Waltham Butternut	95									DS																			*	*	*	*						
LEGUMES	**Peas**	Sugar Ann (snap)	56									DS									*	*																	
		Sabre (sugar/ shelling)	68									DS										*	*																
	Beans	Blue Lake (bush)	60									DS										*	*																
ALLIUMS	**Onions**	Calibra	100			IS						DS								*	*	*	*																
	Garlic	Red Russian																					*													DS			
ROOTS	**Radishes**	Cherry Belle	21									DS				*	*																						
	Potatoes	Yukon Gold	90									DS													*	*	*	*											
	Carrots	Nantes	65									DS									*	*	*	*															
	Beets	Early Wonder	60									DS									*	*	*	*															

Kweseltken Crop Planting Calendar (Template)

INDOOR SOW (IS)
DIRECT SOW (DS)
TRANSPLANT (T)
HARVEST (*)



CFDC of CIFN