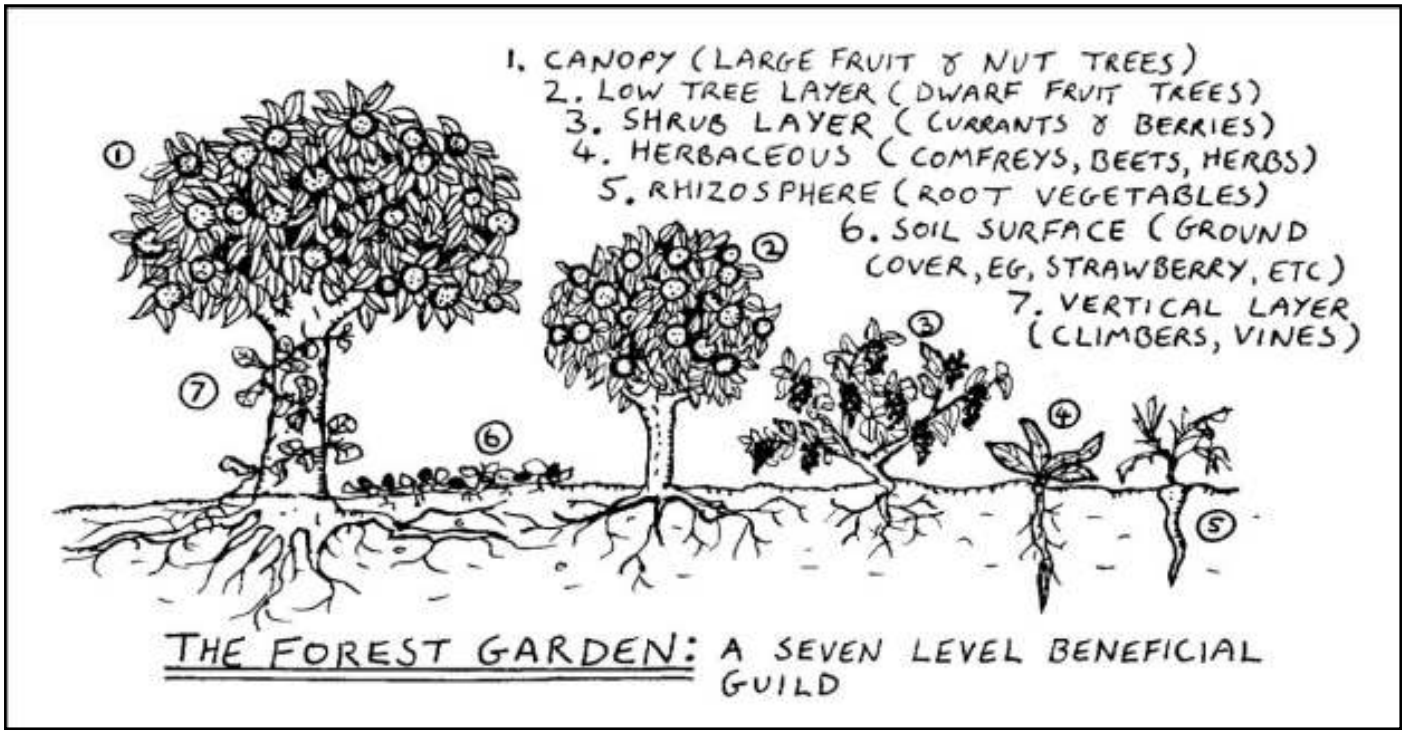
Edible Landscapes

PDC Module 5

Terra Perma Design

permaculture education & design

Are you making the most of your limited urban landscape ?



Terra Perma Design

Terra Perma Design (ABN: 58 663 909 350) is the permaculture business set up by Tod Smith & Tash Levey in 2010. Based in Perth, Western Australia, Tod & Tash are both active permaculturists for many years on their own suburban property. Tod & Tash completed their PDC with Dr. Ross Mars in 2008 and in 2010 qualified as Permaculture Design Course/Certificate (PDC) teachers.

2011 saw Terra Perma grow with local permies and PDC teachers, Jason Nicholls and Charles Otway, joining the team to create a new hub of permaculture education for WA. The business runs PDC's, Intros, and workshops on a variety of sustainable living & holistic topics and design private & community permaculture projects.

Tod Smith &Tash Levey

Tod originally qualified as a Horticulturalist & Arborist and ran his own tree surgery business, before moving into the health industry. Tod is a passionate and knowledgeable speaker and workshop presenter.

Tash is a qualified Industrial Designer who later specialized in landscape design. She is on the Permaculture Association of WA's committee as well as the Project Coordinator at the Lockridge Community Garden. Also as a passionate foodie, she loves to create a sustainable wholefood link from garden to plate.

Charles Otway

Charles is a passionate edible plant ecosystem designer. Bought up in Pemberton on Permaculture rootstock he has seen and eaten his way through much of the theory and is now a fully qualified trainer looking to enlighten the world.

Jason Nicholls

Jason's passion for permaculture started with his journey to build a better place for his family. This began with building a solar passive house, reusing waste, harvesting water, and now focusing on establishing an edible garden. He is also bringing PermacultureWest to the web and to help connect permies across WA thanks to his background in IT. Jason wants to share his knowledge and experience with others, and to help them start their own journey.

Course Booklet and Acknowledgments

Terra Perma need to notify holders of this booklet that it is produced under creative commons licensing. The best available information from local knowledge and experience, Permaculture text books, and internet sources has been compiled and authored by the above facilitators. This book is for educational purposes only.

The Edible Understory – *Or as its more commonly called the Veggie Patch.*

Note: While our topic is edible understory it needs to be understood that canopy trees are the key to abundant long term self reliant ecosystem and while some provide human food (Pecans) most provide essential but hidden benefits to the ecology. We would cover Permaculture Plants and Food Forests and Agro Forestry prior to this section in A PDC so I recommend further reading or our workshops to learn to use trees for urban and rural landscape regeneration.

So in thinking in forest terms this workshop will cover the understory, or Forest Garden as shown on the cover page illustration, and more specifically the 'edible' understory as we all have limited space and budgets. We are designing our urban gardens for maximum yield based on natures 'food forests' as a complex and diverse mix of plants copying the pattern of a juvenile forest is the most productive system.

Yes there is competition for nutrient between trees and vegetables but there are far more beneficial soil companion relationships happening. Essentially if you don't have this complexity you don't have a chance at a dynamically stable ecosystem. And if its simply a lack of nutrients, just add more to the system, its high yield and unless you are composting all your personal 'waste' and your own bodies the system needs a top up from time to time.

There is a huge range of food plants and while many you won't have heard of they have proven easier for me to grow and are worth trailing first. To make it worth your while they will generally be hardier and more nutritious than iceberg lettuce and other common greens, hence being chosen to fulfil this role in a more holistic, robust, self care food production system.

One of the keys to coming to grips with this non vegetable isle plant/food list change, is understand that these plants are very high in nutrients, you don't need to eat the whole plant, often a leaf will provide enough of what that plant offers of a particular nutrient or mineral. Start by mixing some of these unfamiliar home growns with 'tastier' store bought but nutrient poor foods.

There are more reason than I will remember to discuss as to why a particular plant has been chosen above others, these will include but not be limited to, increasing diversity of species, immunity or better performance against common pests (Fruit fly, Eggplant Caterpillar, birds, rats etc), summer hardiness, tolerance of poor alkaline soils, growth habit, yield, storage capabilities of crop, flavour, and availability.

Those points are not in order of importance but from a permaculture perspective (food security, plant robustness in the system and yield) I am less driven by exquisite taste as I am by knowing I have a reliable, nutritious, food source when I need it.

It might be handy for a number of reasons to have a copy of the following tables of plant types/families from Seed Savers Manual by Jude and Michael Fanton.

As you can see there are far more food plants than we see on the super market shelves, many are not there as they dont keep once picked for the many weeks that the commercial 'fresh' produce system requires. Or they dont fit our western sweet and bland tastebud desires.

APPENDIX B

List of Plants by Family

Those species marked with an asterisk do not appear in this book but if they are of interest, the techniques of propagating will be similar to those for their close relatives.

AMARANTHACEAE
Amaranthus spp. – Amaranth

AMARYLLIDACEAE [sometimes known as ALLIACEAE, and formerly included in LILIACEAE]
Allium ampeloprasum – Leek and Elephant, or Levant, Garlic
Allium cepa – Onion
Allium cepa var. *aggregatum* – Eschallot
Allium cepa var. *proliferum* – Tree Onion
Allium fistulosum – Spring Onion
Allium sativum – Garlic
Allium schoenoprasum – Chives
Allium tuberosum – Garlic Chives

ARACEAE
Amorphophallus spp. – Taro, Elephant Yam
Colocasia spp. – Taro
Cyrtosperma spp. – Taro
Xanthosoma spp. – Taro

ASTERACEAE [formerly COMPOSITAE]
Artemesia drancunculus – Tarragon
Calendula officinalis – Calendula
Chrysanthemum coronarium – Garland Chrysanthemum
Cichorium endivia – Endive
Cichorium intybus – Chicory, Witloof
Cynara cardunculus – Cardoon
Cynara scolymus – Artichoke
Helianthus annuus – Sunflower
Helianthus tuberosus – Jerusalem Artichoke
Lactuca sativa – Lettuce, Celtuce
Scorzonera hispanica – Black Salsify
Tagetes spp. – Marigold
Taraxacum officinale – Dandelion
Tragopogon porrifolius – Salsify

BASELLACEAE
Basella alba and *B. rubra* – Basella

BORAGINACEAE
Borago officinalis – Borage

BRASSICACEAE [formerly CRUCIFERAE]
Armoracia rusticana – Horseradish *
Barbarea praecox – American Upland Cress
Brassica hirta – Mustard
Brassica juncea – Mustard Greens
Brassica juncea var. *japonica* –Mizuna
Brassica napus – Rutabaga
Brassica nigra – Black Mustard
Brassica oleracea var. *acephala* – Kale
Brassica oleracea var. *acephala* – Collard
Brassica oleracea var. *botrytis* – Cauliflower
Brassica oleracea var. *capitata* – Cabbage
Brassica oleracea var. *gemmifera* – Brussels Sprouts
Brassica oleracea var. *gongylodes* – Kohlrabi
Brassica oleracea var. *italica* – Broccoli
Brassica rapa – Turnip
Brassica rapa var. *chinensis* – heading Chinese Cabbage
Brassica rapa var. *pekinensis* – open-hearted Chinese Cabbage, Turnip
Cardamine pratensis – Meadow Cress
Crambe maritima – Sea Kale *
Eruca sativa – Rocket
Lepidium sativum – Upland Cress
Raphanus sativa – Radish
Nasturtium offficinale – Watercress

CANNACEAE
Canna edulis – Queensland Arrowroot

CHENOPODIACEAE
Atriplex hortensis – Orach
Beta vulgaris – Beetroot, Silver Beet
Chenopodium bonus-henricus – Good King Henry (Fat Hen)*
Chenopodium quinoa – Quinoa *
Spinacia oleracea – Spinach

CONVOLULACEAE
Ipomea acquatica – Water Spinach
Ipomea batatas – Sweet Potato

CUCURBITACEAE
Benincasa hispida – Wax Gourd
Citrullus lanatus – Watermelon
Cucumis anguria – West Indian Gherkin *
Cucumis melo – Rockmelon, Oriental Cooking Melon, Armenian Cucumber *
Cucumis metuliferous – African Horned Melon
Cucumis sativus – Cucumber
Cucurbita ficifolia – Chilacayote
Cucurbita maxima – Pumpkin such as the Queensland Blue
Cucurbita mixta – Some Pumpkins, often called Japanese
Cucurbita moschata – Gramma, Butternut
Cucurbita pepo – Squash, Zucchini

APPENDIX B cont'd.

Cyclanthera pedata – Korila
Lagenaria siceraria – Gourd
Luffa acutangula – Luffa, Angled
Luffa aegyptiaca – Luffa, Smooth
Luffa cylindrica – Luffa, Smooth
Momordica charantia – Bitter Gourd
Sechium edule – Choko
Sicana odorifera – Casabanana *
Trichosanthes anguina – Guada Bean

CYPERACEAE
Eleocharis dulcis – Water Chestnut

DIOSCERACEAE
Dioscorea alata – Yam

EUPHORBIACEAE
Manihot esculenta – Cassava

GRAMINEAE [sometimes known as POACEAE]
Cymbopogon spp. – Lemongrass
Zea mays – Corn

LABIATAE [sometimes known as LAMIACEAE]
Mentha spp. – Mint
Ocimum basilicum – Basil
Origanum spp. – Marjoram, Oregano
Rosmarinus officinalis – Rosemary
Salvia spp. – Sage
Thymus vulgaris – Thyme

LEGUMINOSAE [sometimes known as FABACEAE]
Arachis hypogaea – Peanut
Cajanus cajan – Pigeon Pea *
Canavalia gladiata – Sword Bean *
Cicer arietinum – Chick Pea *
Dolichos lablab var. *niger* – Hyacinth Bean
Glycine max – Soya Bean
Pachyrrhizus erosus – Yam Bean
Phaseolus coccineus – Runner Bean
Phaseolus lunatus – Lima Bean
Phaseolus vulgaris – Bean
Pisum sativum – Pea
Psophocarpus tetragonolobus – Winged Bean
Vicia fava – Broad Bean
Vigna umbellata – Rice Bean *
Vigna unguiculata – Cowpea
Vigna unguiculata subspecies *sesquipedalis* – Snake Bean

LILIACEAE
Asparagus officinalis – Asparagus

MALVACEAE
Abelmoschus esculentus [Hibiscus esculentus] – Okra
Abelmoschus manihot [Hibiscus manihot] – Hibiscus Spinach
Hibiscus sabdariffa – Rosella

OXALIDACEAE
Oxalis tuberosa – Oca

PAPAVERACEAE
Papaver spp. – Poppies

POLYGONACEAE
Rheum rhubarbarum – Rhubarb
Rumex acetosa – Sorrel

ROSACEAE
Sanguisorba minor – Salad Burnet

SOLANACEAE
Capsicum annuum – Capsicum, Chilli
Capsicum baccatum – Chilli
Capsicum frutescens – Chilli, tabasco types
Capsicum pubescens – Chilli, manzano types
Lycopersicon esculentum – Tomato
Lycopersicon pimpinellifolium – Cherry Tomato
Physalis ixocarpa – Tomatillo *
Physalis peruviana – Cape Gooseberry
Solanum melongena – Eggplant
Solanum muricatum – Pepino *
Solanum tuberosum – Potato

TETRAGONIACEAE [sometimes known as AIZOCEAE]
Tetragonia tetragonioides [T. expansa] – New Zealand Spinach

TROPAEOLACEAE
Tropaeolum majus – Nasturtium
Tropaeolum tuberosum – Anu

UMBELLIFERAE [sometimes known as APIACEAE]
Apium graveolens – Celery, Celeraic
Anethum graveolens – Dill
Anthriscus cerefolium – Chervil
Arracacia xanthorrhiza – Peruvian Parsnip
Coriandrum sativum – Coriander
Cryptotaenia japonica – Mitsuba
Daucus carota var. *sativus* – Carrot
Foeniculum vulgare – Fennel
Pastinaca sativa – Parsnip
Petroselinum crispum – Parsley

VALERIANACEAE
Valerianella locusta – Corn Salad

VIOLACEAE
Viola spp. – Pansy and Violet

ZINGIBERACEAE
Aframomum spp. – Paradise Pepper
Alpinia galanga – Laos, or Galangal
Amomum spp. – Cardamom
Curcuma spp. – Tumeric
Zingiber spp. – Ginger

Edible raw greens.

These are essential in any system, they act as both a vegetative cover and ecosystem for the plants and animals but also the most important everyday vitality providing food for your body. You cant beat raw, fresh, home grown leaves for adding that minor but critical living element (lifeforce) to each meal. Kale, Brocolli and lettuce bought in the shop while looking like healthy veggies maybe 2 weeks old stored in the fridge until it is freshened up for your perusal at the shop.

Diversity is the key as always, this allows for 5-6 usable greens any time of year any weather. We cannot control the weather other than in small microclimates so we must choose plants and design our understory foods well enough to deal with rain and 10oC in winter, humid mildew shoulder seasons, and sun and 40oC in summer.

A bowl of 'garden salad' will normally contain at least 10 varieties of green leaves alone, then add flowers, vegetable fruits, and you can see why you only need 2-3 leaves of each plant species to be making a big salad.

Feel empowered here, a little bit of mineral rich food goes a long way in keeping your body healthy, like bush foods (wattle seed, midyim berries), and wonderfoods (i.e. goji berries) a little bit of good stuff goes a long way. You can eat lots of store bought cheap staples, but by adding a little fresh healthy food from your garden every day you will be much healthier and less out of pocket. Start with leafy greens and herbs, these are best picked every day as wanted and therefore you can't buy that quality in the shops even organic one, and with shopping every day.

Kale is a staple, better in winter and shoulder seasons but in good soil it is perennial and while suffering the heat of summer will come back with better flavour as cooler weather returns. The are several types of Kale, Red Russian is my favourite for flavour and flat leaves that are easier to keep/get white fly and aphids off. If you pick out the leader of the plant once a few months old it will bifurcate and provide more faster maturing but smaller leaves. I find this better when trying to harvest the leaves before to many aphids poo or mummify due to predators on it. The smaller leaves are better and more tender for raw salads, which is the best use of these leaves. Cooked they are a replacement for cabbage but as with all cooking a lot of goodness is lost.

English/French dandelions (not the wild yellow flowered 'dandelions' in most lawns they are cross bread with less palatable Cats Ear and other species), Chicory, Sow Thistle, provide year round staple supply of nutritious greens. Loose leaved plants they allow plucking of 2-3 new leaves per plant each week without any loss of vigour. There is more goodness in a single (sometimes bitter) dandelion leaf than and entire Iceburg Lettuce (except for vitamin A which is high in Iceburg but that's all it has). These plants are all mildly bitter so are a good minor addition, lots of mineral so we only need smaller amounts. One leaf of each per person in the salad is ample, if you don't like the taste view these as preventative medicine (no medicine tastes good), wrap the leaves around a chip like my kids and eat with meat, and you wont even taste it.

As with the above three, purslane, chickweed, fat hen, rocket, nasturtiums, parsley, mallow, and sorrel are self perpetuating or self seeding often weedy species. This makes them perfect for the open plan nature of an understory perpetual food supply system. The plants never become weedy as you are eating them every other day and they a naturally suited (hence becoming weeds) so need far less effort to maintain. The added bonus is that they have more nutrients that conventional veggies like broccoli, and lettuce.

Onion leaves/shoots, leaks, chives, garlic chives, shallots, etc can make a nice minor addition to salads, a bit like a salad onion but without having to wait the 3-4 months to grow the salad onion bulb. The point here is that you can get most of your garlic and onion flavours from the leafage rather than battling with growing times, season limits, and challenges of plumping up onions/shallots/garlic, but we can discuss this more in cooked greens.

A good source of hardy summer greens in Malabar (Ceylon) Spinach, a climbing succulent plant. Like the mallows it has mucilaginous leaves which people its like or dislike. But if you don't enjoy it in salads it makes a fine Quicke spinach replacement.

At the opposite end of the year Nasturtiums are an excellent peppery green leaf, delicious flower and even caper replacement (green seeds pickled like capers) for free. They like a moist shady location but will cope anywhere until late spring when temps get above 30 and the sun kills them off. Nasturtiums are also a great living mulch, trap crop and pest confuser with rampant growth and pungent mustard smell. While they can take over they are very easily removed and make great compost.

While self seeding and self perpetuating annuals (self cloning bulbs etc) are the best annuals (i.e. you don't even have to plant them yourself and then come up when and where nature intended, within 'garden confines') having trees, bushes and vines that provide edible and palatable greens is very helpful.

Perennial beans (7 year beans) specifically Lab Lab provide edible flowers, leaf tips and young pods. Lab Lab needs some space/trellis to climb. I have one growing up a deciduous Maple Box Alder tree, the added bonus is it is a nitrogen fixer, so is highly recommended.. The Choko vine and perennial zucchini Chilacayote also provide edible leaves, flowers, and even roots, as well as there main vegetable fruit. These plants are easy growing once established, but all perennials take the first year to establish a large strong root system so don't expect a huge harvest or thriving vine in the year of planting.

The hardy summer loving Moringa (Drumstick Tree) provides high nutrition peppery leaves highly regarded and widely used in India. Establishing the tree (seedling stage) can be challenging but ounce you have a tree it can be pruned for edible salad greens for many years.

Other less know but highly recommended raw greens are; Salad Burnet, Strilloto (Scullpit), Shinjuku (Chrysanthemnun), scorzoni. All are hardy in Perth and provide green in summer when tradition leafy greens may be suffering.

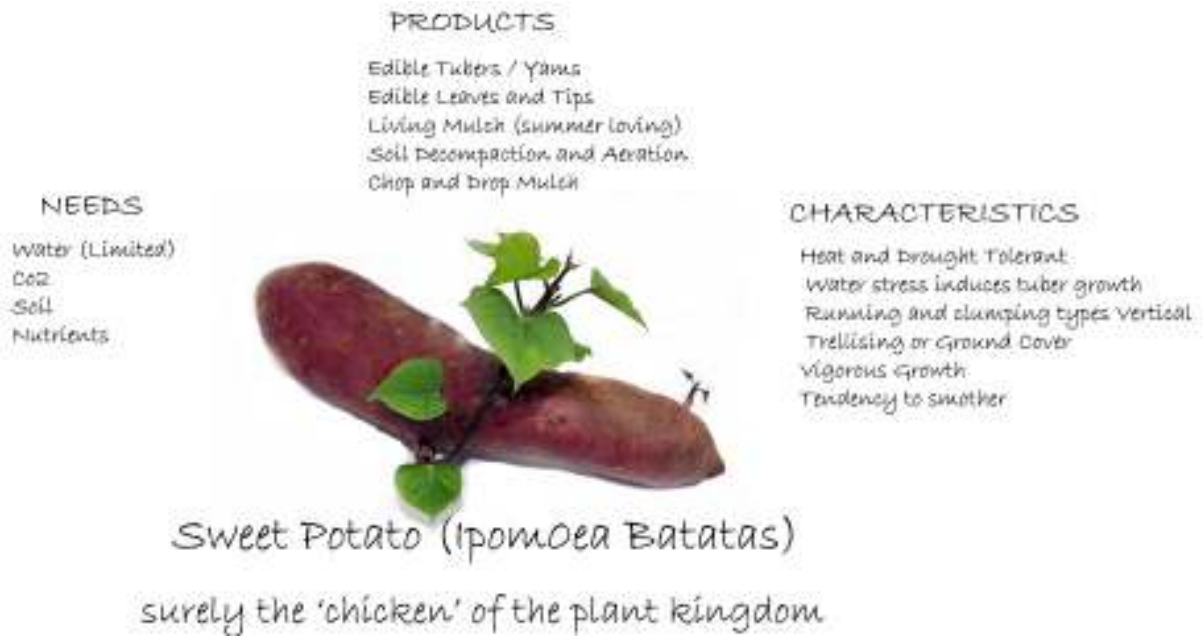
In summary for the most hardy edible understory (wild garden) start with the following, Fat hen, Kale, Dandelions, Chicory, Garlic Chives, Parsley. These will grow on our poor sandy soils even before you improve the soil or create specific garden beds. All produce seed prolifically so can become weedy if you don't 'eat your weeds', but these are hardy easy food supplying Perth Permie Plants.

Weeds like Sow Thistle, Dandelion, Spikey Lettuce may arrive themselves, many weeds are edible and even nutritious, familiar yourself with the edible weeds articles on PermacultureWest website to take advantage and even cultivate (cultivated weeds taste better) and avoid or remove inedible and very occasionally poisonous weeds.

Edible Cooking Greens.

While you can cook any of the greens some are only palatable cooked, or have toxins removed when cooked. Many weedy/wild species are often proportionally high in oxalic acid, which is why I add a lot of kale (low oxalic acid and replacing lettuce) to the salads to dilute the ratio. Cooking for 2-3 minutes (and disposing of water) can be used to remove oxalic acid, this technique is advised for consuming NZ Spinach (warrigal Greens) frequently or in bulk.

The best permie plant cooking green in my opinion for perth summer is sweet potato. While primarily a tuber crop, the leaves and plant tips are edible, numerous, virtually pest free, and grow all year round, especially in hot summer when most other fresh produce is suffering the heat. It has a mild coconut flavour to me and is great in Asian stir frys, soups or just cooked as a spinach substitute. This plant is a permie poster child so much that I have illustrated it similar to the humble but exceptional useful chicken. THE Perth Permie Vegetable all varieties, running and clumping should be sourced for the many niches they can fill in your system (garden)and different tubbers and leaf flavours they have. I think I have about 5-6 varieties and they readily propagate so get to know someone, or as us at Terra Perma for some cuttings.



The other best cooking greens include, Kale, Malabar Spinach, Mallow (wild and marshmallow), broccoli leaves, the general onion family (leeks, chives, shallots etc), parsely, hardy flaovour enhancing pot herbs (sage/rosemary/thyme).

Less know but equally hardy cooking greens include, Curry Leaf (tree), Espazote, Wolf Berry, Stinging Nettles, Lovage, Kang Kong, and Evening Primrose. Curry leaf is the traditional curry flavour loving Perth climate. Espazote is a strong flavour (anti wind plant) weed traditionally eaten with beans, Jerusalem artichoke and other 'windy foods' to reduce the effects. Wolf berry or Gogi is know for it fruits but the leaves are a healthy cooked or even raw green. New lovage shoots have a strong parsley/celery flavour, and while celery is relatively easy to grow I find lovage and parsley much easier and similar hence substituting them.

Evening primrose is more a medicinal herb but has good eating young leaves that given it weedy nature should be one of your seasonal high yield high nutrient food supply.

Edible Flowers

Many of the edible plants listed earlier also have edible flowers, so other than advising you to look into which they are on the tables I won't go into it here. It need a little consideration and thought though as in some ways it will reduce yield and in others make no difference for example, the flowers of pumpkin and squash are a delicacy in many cultures - you can eat the male flowers and leave the females to produce fruit.

Roses offer many yields other than beauty. Older traditional roses like Rosa rugosa or R. gallica officinalis have edible flowers and good sized rose hips that are high in vitamin C, and make good jelly/jam. These traditions roses are very hardy and can be often seen in house ruins where the date palm, fig and roses are still battling on long after the house has crumbled to the ground.

The elderberry bush (Sambucus nigra) has been used for centuries as a multi purpose plant in Europe - it's medicinal qualities are listed in most herb books, the fruit used for preserves and elder berry wine and the flowers are prized for pot pourri, wine making and most of all for making elder flower fritters . In Perth the elder rarer has berries but the yield in refreshing elderflower codial or wine in the hot perth summer is reason alone to grow this. Place near compost bins/systems as its bushy nature provides shade while its roots provided symbiotic benifits to the compost pile.

Day lilys are highly recommend, I have lost mine and must get some more as they are beautiful, hardy and prolific providing plenty of flowers for colour in salads and food value. Note: Many liliums are not edible, so ensure you are getting plants of the Hemerocallis species and ask directly of the supplier as to their edible

nature.

Robyn Francis gives a few hints on how to use edible flowers "regular ornamental flowers that can add colour and zest as a garnish for salads or sweet dishes: violets, pansies, petunia, carnations, calendula and gladiolus just to name a few. I love to garnish a mulberry pie with borage flowers, spice a baked custard with ginger flowers, toss nasturtium and calendula petals in a fresh garden salad, or top off a parfait with a couple of violets or heartsease.

Vegetables fruits – Tomatoes, beans, pumkins, onions etc.

There is lots of good information on growing common vegetables in vegetable beds in Perth out there already. Greenlife soil company have a good what to sow when calendar, gardenate.com have similar climatic charts on what to grow when, the Agdept has a vegetable growing guide, and while not organic/permie has some very local and sensibly advice.

So what I discuss here are the more hardy vegetables that can deal with some neglect, and whose integration will be an asset to the ecosystem/garden rather than a burden like many mainstream vegetables are now.

The easiest and most rewarding this to grow would have to be cherry tomatoes, a tried a true variety is tiny tom, but most cherry and plum cherry tomatos do very well. In my area and many others around Perth these is a lot of bacterial and fungal wilts in the soil (likely form lots of old market gardens in my area) you will notice you tomato bushes yellowing, drying leaves dying and drying up from the soil up. There is no spray or cure for this, crop rotation and avoiding solanum crops is suggested but I have the virus everywhere so rotating to new soil while good practice is pointless.

While a few varieties are meant to be immune I have not gone to that effort of sourcing and trailing as I cant eat to many myself and cherry tomatos grow faster than the wilt in good soil. The best other option is to grow tomatos in a pot, buy some coconut husk (coir) fibre blocks and some compost, isolate the pot from the soil with a dish/base and feed the tomato with liquid foods. While this is not the most self reliant system it will provide good reliable crops and used ounce pot soil is a great garden amendment or fine for other types of pot plants next time.

The other option is to grow Tamerilos or tree tomatos, these seem resistant to these soil bourne issues. While they don't taste the same they are a tastey alternative, or as we always suggest grow both. Tree tomatoes often grow above 6 foot and are not that fond of wind so you do need a suitable space, but that might be above your garden beds, hence using vertical space and creating much needed shade.

Other hardy common plants worth either growing in vegetable beds or in a diverse interplanted fruit tree understory are; Capsicums (sweet fleshed Paprika forms for great), Chilli's (unless your eating a lot or using it for spray you wont need more than 2-3 varieties. I am trailing some of the original bolivian chilli 'trees'. These can grow to 6 foot and provide huge yields, while also providing a bush like habitat and vertical stacking.

Bush beans and runner beans are great additions to any system most are hardy, nitrogen fixers and if regularly harvested should provide 2-3 long flushes of beans (bags of beans). Dragon Tounge is a good bush bean, and purple king and blue lake are good climbing beans to start with. These do well in spring/summer but ounce it start to heat up you are better off putting in snake beans and other sub-tropical varieties (winged bean, New Guinea bean (a gourd)). There are 7 year beans as discussed previously, Scarlet Runner is a strong perennial bean but is heat or day length sensitive so in Perth only fertilises flowers to beans in a small part of autumn and spring so not worth it. Lab Lab (I have Wentworth variety) is a great option, and while producing pods that look more like snow peas than beans, when picked young are a prolific and delicious vegetable.

High yielding but bland perennial crops such as chilacayote and Choko are essential parts of a permaculture garden based on providing as much food as possible. Combined with sweet potato these high yield plants can provide staple bulk food. It is up to us to flavour and utilise this ubundance rather than under value it given its commonality. Chokos and Chilacayotes can be a sweet or savoury bulk to meals from soup to jams.

Summer options also providing bulk ounce they get going are New Guinea bean, Armeniam Cucumber,

Tomobonchino, Wax Gourd/Winter Mellon. All are worth planting early summer, providing a tree or substancing climbing frame and stand back. They do suffer from mildew so some ventilation of the massive growth is best, and keep water off leaves.

Carrots are great, there are good heirloom varieties so don't get the orange ones that all mature within a week and are tasteless from Bummings. The older varieties are hardy, longer yielding prior to getting woody and colourful. A better option to carrots in Perth is Burdock, this root crop has been used by Japanese for hundreds of years as a superior replacement for carrots. The Burdock like well drained deep soil (sand is perfect) and the roots can reach half a meter so the only trick is getting them out. Salsify is also a good carrot like root crop to include in this mix, and lets not foget some parsnip for the essential soup flavour. All species set seed in the second year, so don't harvest them all, they readily germinate (self seed) if left to drop seeds insitu so are a great deep rooted soil centered vegetable. Observation of Burdock seeds lead to the invention of Velcro so you might want to harvest and store these seeds rather than get them in your socks and pets, also not the seed husk/fluff is very itchy like fibre glass so take care when processing it. Burdock also has large broad leaves rather than fern like fronds like the others. Appreciating the difference in even similar/equivalent plants allows us to use them to the best advantage in gilding and dense interplanted poly cultures.

Some perennial larger options replacing there smaller more interbreed siblings are the 4 foot plus Pea Eggplant (Solanum Torvum), 6 foot tree tomato (tamarillo), Tree Kale and giant dill. If these giant vegetables seem harder to fit in a small urban block/garden you are missing the point, there size is the advantage. They provide shade and use of vertical space and sun, while still allowing mainstream garden beds underneath. The Pea Eggplant does have rose like thorns but the plant is easily pruned to appropriate space (just disposed of the thorny and hard ounce dry pruning's in the right spots)

There are hundreds of fruiting vegetables other than those mentioned, this is a small selection of those hardy enough to take some neglect and lesser known but very appropriate in a Perth sustainable/ecological thoughtful garden situation. Start with those above skill up, make your observations, improve your soil and learning and then hit the plant catalogues at Diggers, Yilgarn, Green Harverst, Italian Gardener, Seed Savers networks and diversify or even get a bit extravagant with your mainstream shop favourites.

Tubers and Roots Crops

The best tuber crop in Perth is clearly sweet potatos, some varieties produce a huge yield for very little effort or water input. They would be the equivalent to potato staple food of the Irish. This is fortunate in many ways as we have lots of pests for Solanum species of which the potato is one.

Common sweet potato varieties are the orange skinned orange fleshed, the red skinned (purple when freshly dug) white fleshed one, and the small tuber white skinned white and purple flecked flesh. The orange one seems to be more sub-tropic harder to grow variety. The large red one provides the largest easiest yields that I have found so far. An observation I have made recently is that the running varieties (above ground and climbing growth) seem to set tubers close to the base, whereas the clumping varieties tend to send runners/tubers out several meters. This is logical as other than seeds (which don't set in Perth) the runner propagate and move via rooting runners and the clumpers move via long ranging roots and tubers creating new plants next season.

Jerusalem Artichokes are also prolific hardier producers. Called Sun chokes in other countries these plants have a sunflower on top but set small tubers under the plant. One 4 foots choke can yield a 10 litre bucket of tubers. The one downside is the inulin in them is not possible for the body to breakdown and creates gas. The upside is this chemical is very beneficial in other heath reasons. The plant has very few predators and is well worth growing. Tubers can be eaten fresh raw (crispy like apple) or are excellent roasted in the oven.

Arrowroot (Edible Canna's) are a great permie plant, arrowroot starch is a primary flour for many nations that is extracted simply from the root rhyzombe by mashing/crushing it in water. The fluid is then strained off and evaporated to leave a fine high quality but lower nutrient valve flour. The large leaves are used for wrapping foods for cooking similar to bananas but in a smaller scale. These plants grow rapidly in moist but

poor soil, I have them growing in a basic sandy wicking bed (under soil reservoir bed), and allow chop and drop mulch to be created from the leaves when not maximising tuber production.

I am currently trailing Cassava (Tapioca flour) which is another islander staple. Cassava contains varying levels of oxalate crystals and cyanide so while a very hardy, pest resistant staple food source needs knowledgeable selection and processing.

Jicama Climbing bean was a successful summer crop last year and should provide excellent yields in perth given a climbing space. Each vine creates a large turnip (rounded) tuber of high nutritional value. The beans of this species contain Rotadine toxin so while it does produce beans these are for propagation of the next years plants. While the plant can be perennial my tubers rotted in winter so its better to harvest the young (3-4 month old tubers) to avoid fibres forming and rot, and grow from seed each year. This growth is rapid and I imagine a healthy self seeding due to toxin in the seed and hot summer heat suited germination.

Water Chestnuts and Bullrushes also provide a good tuber yield but will be discussed more in Aquatics section.

Potatos can do well but require hilling, fairly rich soils, avoidance of many pests and climatic conditions. Potatoes are worth growing in the vegetable garden but are less suited to a hardy natural garden system. I recommend Royal Blue as the main variety to grow, the suds are smaller than white ones but rich, yellow and dense for excellent cooking qualities.

True yams would be great to try also, they are very hard to get hold of in WA, if you have some or a source please let us know. By yams I mean the ***Dioscorea*** genus not Ipomoea (sweet potato).

Berries and Vines

Perth is quite hot for most berries and most wont thrive. That said Bramble Berries (blackberry, Younger, BoysenBerry, Silvan) will grow and bear well in the right situation. Some might require a bit of shade at midday in summer, and afternoon shade/protection is also important for all berries in Perth. Bramble berries and raspberries can be invasive so need to be isolated and managed. Raspberries are like mint their roots sucker prolifically and seek out the best and moist soil and start growing there, up to 3-4 meters from your patch. The others propagate by the canes growing long and falling over and the cane tips rooting and forming the next plant. Hence keeping the root zones of raspberries isolated (wicking bed/pot) and the canes of others tied up and pruned these berries are controllable and worth a go. The thing to remember is they are full of flavour so a little bits goes a long way in flavouring other more bland things (choko/chilacayote/jam mellon/apples). There are now non suckering thornless blackberries cultivars that take a lot of the issues out, for a raspberry variety stick with the old 2 crop a year Heritage in my opinion it does well on neglect.

Dont bother with currants as they require chill and cooler temps than perth and would even be marginal in the hills.

Another highly recommended (I love the sour pumpy flavour) berry to try is Cape Gooseberries (Golden Berry) . They are a vigourous bush and propagate via lots of seeds, so ounce you have one the birds will make sure you get a few seedlings around the place for ever more. These are easily removed so not weedy. The main issue I find is they are susectable to red spider mite if allowed to get to big and/or under water stress, and they are again of the solanum species so have many pests. That said I highly recommend this berry.

Similar but lesser know and more widely feared is the Blackberry Nightshade, often incorrectly called Deadly Nightshade (Beladona is very rarely found in Aus) Backberry nightshade provides a bountiful supply of small black berries. The green berries are not edible, but if you give the bunch a tickle or the plant a shake those ripe berries will fall off. Chooks love these berries and will go straight for the bush if they ever escape the run. So why not maximise this relationship, plant (or transplant your volunteer weeds) to the side of the chook run and have half the out of hand fruit for you and the missed daily crop can fall to the chooks. This cursed weed is certainly a lost opportunity in most gardens, as it is the most pest resistant easiest of the

berries to grow in Perth.

Strawberry's will do very well if you can keep the roots moist and give them plenty of sun, the trick is keeping the bugs out of them so you get some. I recommend some kind of elevated self water pot arrangement (hanging baskets tend to dry out to fast). A Japanese variety called Hokawasi and the small alpine white and red strawberries are good ground cover/producers, named brands in shops tend to produce bland fruits so look around.

While not a berry the Pepino is also worth growing. It is a clumping dark green bush (again Solanum family) that has hand sized oval shaped fruits that taste somewhere between honeydew and rockmelon. It is a heavy feeder and the fruit need to be kept of the ground (try growing up into and wire frame) to avoid black beetles and slugs having a field day with the thin skinned delicious fruit.

The native Midyim produces a multitude of tiny berries, a smaller native version of a blue berry. IT is a hardy prostrate ground cover to bush and well worth growing.

You could also try monsteria fruit, many people are growing the giant elephant leafed plants as decoration without realising the Monsteria fruit is tasty and edible. Look it up one to try later.

Edible and Medicinal Herbs

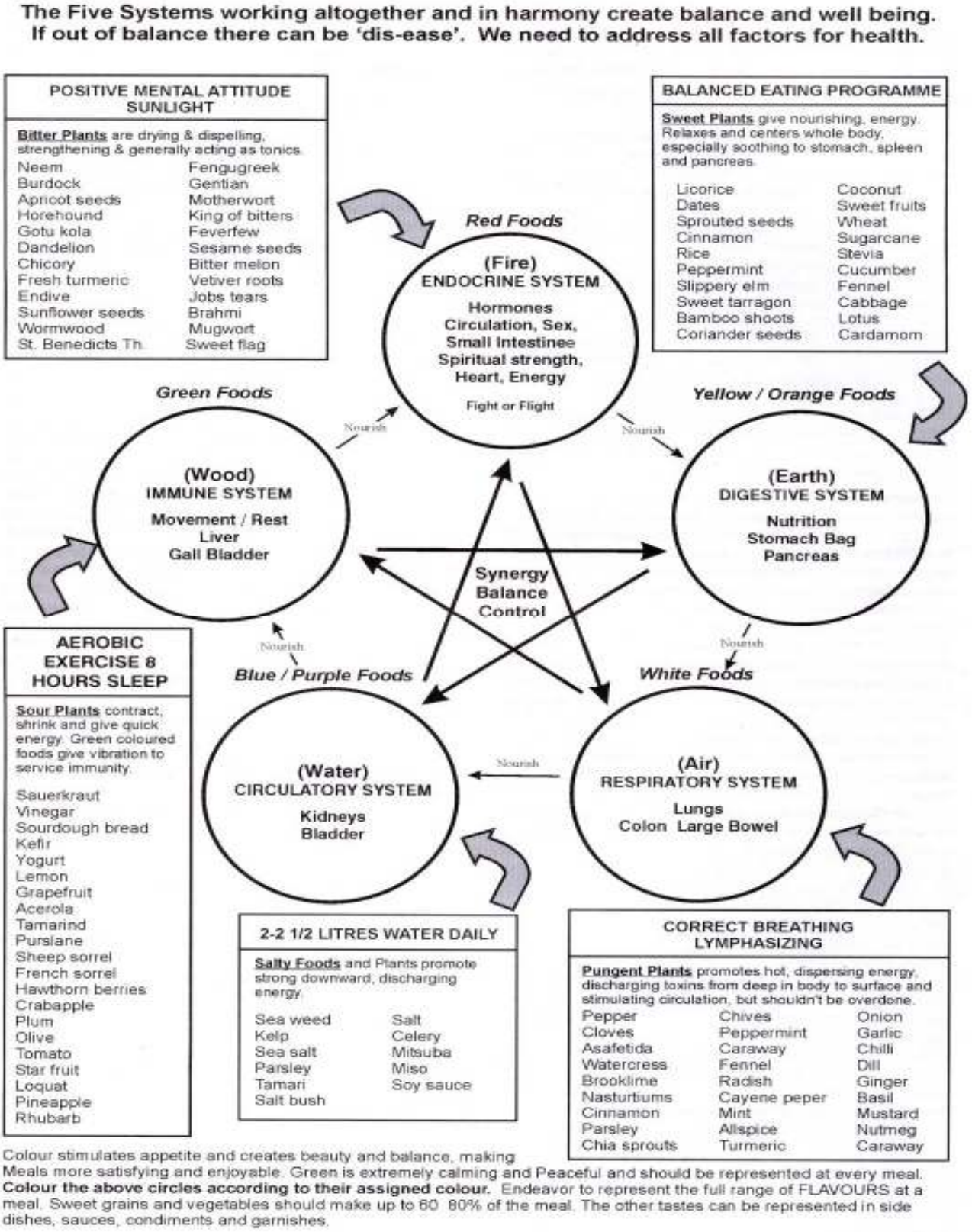
Isabel Shipards book, How can I use Herbs in my Daily Life, is an excellent discussion of the true value and necessity of herbs and preventative eating/medicine. Without a fancy understanding of herbal medicine one can used Five Systems diagram over page to help create a more balanced herb/food intake supporting all areas of the body.

Herbs I have found that grow easily in Perth are list below.

ALOEVERA	FEVERFEW	POPPY
AMARANTH	FIGWORT	WILD ROSEMARY
ASHWAGANDA	GINGKO	RUE
BALM LEMON	HERB ROBERT	SAGE
BASIL	HOLLYHOCK	SKULLCAP
BORAGE	HOLY BASIL	SOAPWORT
DANDELION	HYSSOP	SORREL
BERGAMOT	LAMBS EAR	SOUTHERNWOOD
BETONY	LAVENDER WILD	SPEEDWELL
BORAGE	LEMON VERBENA	STRAWBERRY
SALAD BURNET	MARIGOLD	TANSY
CALENDULA	MARJORAM	BLESSED THISTLE
CATNIP	MARSHMALLOW	TARRAGON
CELERY	MINT	SOW THISTLE
CHAMOMILE	MOTHERWORT	THYME
CHICORY	MUGWORT	VALERIAN
CHICKWEED	MULLEIN	VERVAIN
CHIVES	NASTURTIUM	VIOLET
CLARY SAGE	NETTLE	HERB WILLOW
RED CLOVER	PANSY	WOAD
COMFREY	PENNYROYAL	WORMWOOD
EVENING PRIMROSE	PLANTAIN	YARROW
FENNEL		

Start with the shaded ones and increase from there.

As you can see that we can easily grow and consume our own preventative medicine as part of the supporting understory of our forest garden or garden beds. Herbs are excellent plants, providing the medicine cabinet, food and habit to insects and wildlife, dynamic accumulation of elements and a complex diversity that is essential of management (confusion of pests).



Plant worth special mention due to the excellent overall health vigor tonic nature that grow very well in Perth are Herb Robert (and edible Geranium), Ashawaganda (Indian Ginseng). Herb Robert is easier to use 1-2 leaves a day whereas Ashwaganda can involve root harvesting but both should be in your living medicine cabinet. More will be learnt about these and many more by reading that book.

Herbs are your food and medicine treasure them. And don't forget the common sage, thyme, parsley etc.

Beneficial Understory/Garden Plants

Plants highly recommend but missed in the previous sections.

Alafalfa/Luecerne – Covered as a perennial pasture, but well worth plating in your garden for the nitrogen fixing, edible flowers, great mulch (Lucerne hay). I am trailing them as a central row/element in garden plant systems, as they allow variable height, feeding companion plant.

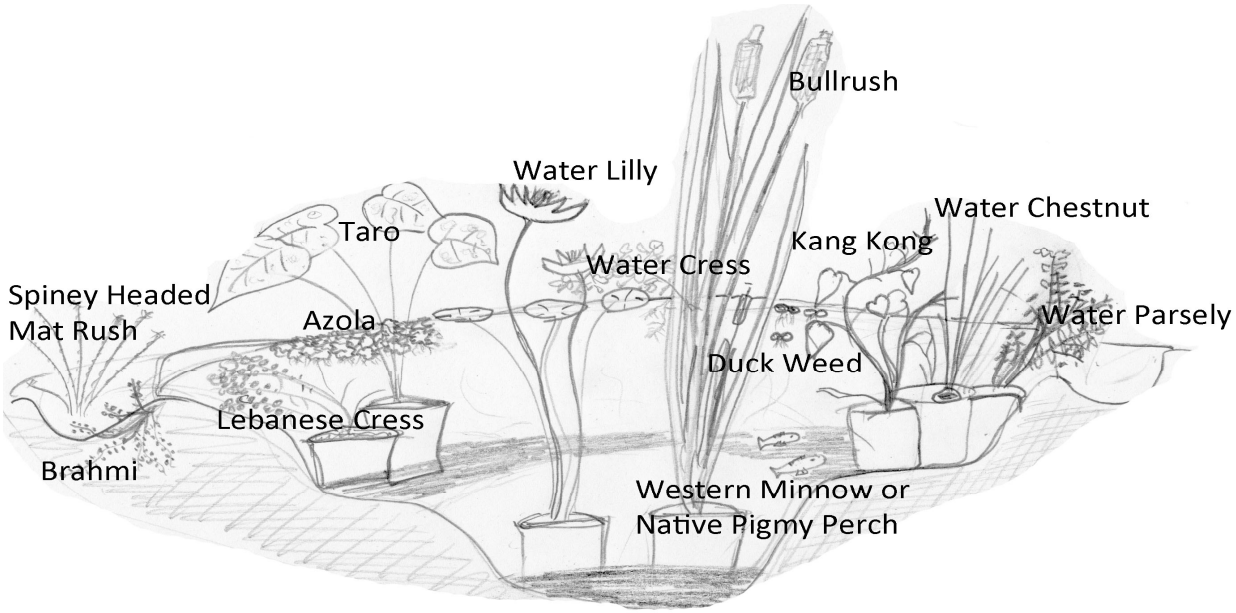
Holy Basil (Tulsi) – This herb while not the best tasting basil is perennial, it will be around when you have no other basil. Its main purpose is to flower profusely bring many native and feral bees and wasps and other predatorial mechanisms to your system.

Flowering Tobacco – Not for smoking but for pest control, planted in Brasicas prone to white fly the Tobacco has stick blobs under its leaves which trap whitefly coming for a feed. It is also used in India as a insect spray, but I find mind gets eaten by caterpillars so not sure what it kills.

Mexican Marigold – The main plant for deterring nematodes in the soil. The only issue with that plan is taht 95% of nematodes are good so I am not sure on that logic. Plus mustard crops do a similar jobs and can be used as a trap crop and a predator breeding system before they are cut down.

Aquatic Perth Suited Edible Plants

A pond or water garden is essential in any permaculture garden. It relaxes us, feed us, and provides a habitat and drink for many insects and creatures. A water garden is a diverse aquatic ecosystem, one of nature's most productive and efficient systems, far more productive than any land based systems. This is because the aquatic plants have a constant supply of water that has nutrients dissolved in it.



The trick to creating a stable aquatic ecosystem is the various types of plants in it, each of which plays a specific role to support and sustain aquatic life. Most people go wrong by not adding enough plants and end up fighting algae. To stack in the plants look at the four categories of water plants that can be included in a pond to achieve perfect balance.

1. Rooted floating plants, such as water lilies, Nadoo, Lotus)
2. Marginal plants (Bullrush, Spiney Headed Rush, Pickerel Rush, Vietnamese Mint, Water Chestnut)
3. Submerged (oxygenating) plants (Millfoil, Water Primrose)
4. Floating plants (Duckweed, Azola, watercress)

These plants all being edible or very useful to boot. Dont realease any of the aquatic plants to the wild, they are great Perth Pond Plants for a reason, because they are hardy and prolific so don't go well in native systems.

Grains and Seeds

This is a very brief look at grains and seeds. While and essential part of hobby farming and broad scale food production they are less effective food producing plants in a urban backyard.

The following are worth growing due to easy de-husking and the high value of the seeds meaning you don't need much to improve your health with tablespoons worth of adding to bread made of corn, wheat, arrowroot, tapioca and other less healthy staples. Chia, buckwheat, millet, quinoa, amaranth, flax and Jobs Tears are all worth growing. I would start with Chia being a hardy dry loving Salvia. Most of these grains can be sourced at bulk food places (like Kakulas Borthers in Perth) and while the germination rate may be low, you only need 4-5 plants and you can save your own local seed for next year.

So have fun but be realistic about what you can achieve with grains and seeds in limited spaces.

Making the vegetables mimic the understory – Maximum system yield.

Maximum yield for a permie is the overall performance of the system in its capability to continue to yield a harvest while growing in complexity and size. So we are not looking at getting 5 kg of beans rather, enough bush beans and runner beans over a extended harvest period (rather than a glut), while at the same time nitrogen fixing the soil for other plants and creating a living mulch and habitat for insects and soil life.

Even at the vegetable level while not as obvious as tree crops we are always thinking of the best fit for the system rather than the highest short term yield. This is the difference between a poly culture permaculture garden/system and a beautiful but often mono-crop centred organic garden bed.

Remember to consider the different characteristics of your plants/options. To maximise diversity, resilience and yield make sure you have the best locally performing food and beneficial species of deep rooted (carrots, parsnips, kale), shallow rooted (broccoli, fat hen, lettuce), tuber producing (arrowroot, sweet potato), climbing (beans, sweet potato, luffa), bush/prostrate (plantain, dandelions, lettuce), tall stalked (Kale, leek), annual (fat hen, chrysanthemum), bi-annual (carrot) and perennial (artichokes, Moringa, Kale).

Summary of Understory and Urban plant based food production systems in Perth.

Limited resources and space put a finer point on the permaculture design pencil, focus should be on multiuse perennial (plants that live for more than 1 year) food sources, herbs, and fruit and nuts trees. If you can't think of 5 uses of each plant (element) there is just not room in your urban backyard for that level of inefficiency. We can still use annuals (plants that live for one growth season and die) but they should be hardy, well chosen species capable of self seeding and self perpetuating.

There must be lots of plant and animals systems, and a focus on integration and species diversity for overall food system stability and resilience. We are trying to create an ethno-botanical garden that is as; seasonal, resilient, raw and ecological forest food from which you can hunt and gather, as you wish, rather than be a salve to.

Polycultures

The emphasis on polycultures can't be made enough; conventional mono-cropping broad acre agriculture is the single greatest threat to our world's ecosystems. They poison, deplete, and denude the soil and don't provide even as much yield as a low yielding ecological polyculture. We don't hear about Polycultures, they

can't be farmed by machines and wrapped in plastic for the supermarket, so there is no money in it for large companies.

So let's get the jump on these failing food systems and not contribute to them by buying their artificial food, and instead use all available space for creating edible, beautiful, ecological garden polycultures.

"Permaculture annuals" are hardier plants, generally self seeding and multipurpose. They replace less useful annuals like spinach, iceberg lettuce, and purely decorative flowers. Parsley, basil, borage, sunflowers, Lambs Quarters, Coriander, Dill, loose leaved lettuces, mustard, calendula, Shinjuku and many other annuals self seed enough to allow me to forage and transplant them as required. As most plants that are not killed in cropping they will form flowers and go to seed. Not only is this self perpetual but feeding beneficial insects, creating beauty and extending seasons and therefore diversity when left to go to seed.

Perennial food systems

Perennial food plants offer much more than annuals to a permaculture system, they generally offer multiple uses (sweet potato, soil aerator, living mulch, vertical trellis shade, all year round edible shoots, and edible staple tuber crop), they don't need to be replanted from seed each year and are generally hardier (low maintenance), and as they include larger herbs and trees they provide shade, habitat, and ecosystem backbone of your garden.

Eric Toensmeier has written the best guide to perennial vegetables and it is highly recommended reading, so rather than trying to list more types here please see his text, Perennial Vegetables.

Food system allows more to be acheived than just growing a vegetable. In hard to manage hot dry areas sweet potato survives the 40oC summer days when many plant perish and it mulches and protects the soil, as a bonus the stress on the plant prompts better tubber set. For optimum tuber production new plants should be planted from vine tips each year, but you can certainly leave many plants to grow and expand which allow occasional racooning of tubers. I run a living ground cover food crop of sweet potatoes in hot months and nasturtiums in cooler months, both provide multiple food and system yields, and smother weeds.

Perennial food system must include trees to provide the structure, habitat, biomass, and many other permaculture system building blocks. As space is limited on urban blocks we do have to make careful selections and maximise their benefits. Fruits trees are most commonly used, but nuts and natives or timber crops can be used when appropriate. Hardy fruits like quince, wampi, persimmon, are often forgotten for the more appealing peaches, nectarines and apples which are often climatically unsuitable and pest prone. Fruit and nut trees need to be selected for their overall addition to the system, fruit to eat is just one of the outputs of the tree, the Moringa is a drought tolerant, highly nutritious foliage, edible pods, medicinal qualities tree and can be grown as a 10m tree of a 1m hedge. The nectarine produces nectarines prone to fruit fly requiring netting and is prone to leaf curl and other viruses.

So which is the better use of space, we all need to be inspired and grow what we enjoy eating but given the limited space, time and water resources available in most urban systems some tuff decisions need to be made.

There are many resources of useful trees are available, some even for our bioregion. Jeff Nugents, Permaculture plants is a great resource and further development into forest gardening is encyclopaedically covered in Food Forests by Jackie and Toensmeir

Seed and Seed Saving

Most people buy and plant seedlings, you have to start somewhere, but you do the maths, vegetables seed packet will grow 50-100 veggies for 3 dollars, a seedling punnet is 6 plants. T know where my pocket is telling me to start. That said I will occasionally buy herbs in pots as some are harder to grow from seed, this comes with experience, parsley and basil is very easy from seed, but thyme and oregano would be worth paying for 6 seedlings as they are harder to propagate and will last years and that is plenty.

Seeds

I always advise people to buy open pollinating seeds and grow their own seedlings. This is a little harder than buying seedlings but the results are often better. A cheap plastic greenhouse propagator can be bought at any garden store to make this easy. While it seems like the easy option seed packets in Bunnings all come from UK, these are not local or even Australian suited plants as they have adapted to northern hemisphere Temperate climates and are increasingly hybrid types. **Don't buy them.**

Open Pollinated Seeds – Those that you can save the seed of and if not cross pollinated will produce the same plant that the seeds where saved from.

Heritage/Heirloom – These are open pollinated seeds, saved for generations by someone to produce a specific taste/look/growth, specifically for home gardens, not factory farms.

Hybrids – Deliberately cross pollinated plants, saved seeds will not grow the same, these plants and seeds are designed for factory farms where everything must look the same, mature at the same time and be tough for transportation. This often makes then crap to eat and does not suit backyard food !!

How to Save Seeds

I think the practice of saving seeds is due for a revival. Seed saving is rewarding in so many ways. It's very easy. Even a little seed saving is an empowering and powerful thing to do.

Basics

What you basically do when you save seeds is this: you go to the seeds when they are ready and get them; you make sure they're really dry, and then you store them.

It's as simple as that but …

Getting good seeds at the right time involves knowing the usual life cycle of a plant and whether a seed will stay true.

Plant Types and Specifics

Plants are annual, biennial or perennial.

~**Annual plants** (such as lettuce and tomatoes) flower and mature seed in the same year.

~**Biennial plants** (such as carrots and beets) are normally harvested as food in their first summer or fall but do not flower or produce seed until the next year. In mild coastal or southern areas, biennials will survive the winter under a cover of hay or leaves. In most of continental North America, biennials must be dug up and carefully stored elsewhere during the winter to be replanted in the spring. Most biennials become tall and bushy when going to seed, taking up more space than they did the previous year. They can be thinned or transplanted to twice the usual spacing.

~**Perennials** live and bear seed year after year.

Plants are also classified as either self-pollinated or cross-pollinated although sometimes they can be both.

~**Self-pollinated Plants**: Pollen is not transferred from one flower to another, either on the same plant or between plants. The process occurs within each flower. The flowers have both male and female plant parts and pollination occurs successfully within the single bloom. The seeds of these plants almost always retain the quality of the parent seed, or stay "true." Because they rarely cross with another variety of the same species, isolating them is unnecessary unless you want absolute purity in a strain.

~**Cross-pollinated plants**: The pollen from one flower fertilizes another flower, either on the same or another plant. Either wind or insects carry the pollen. It is important to know the other varieties of the same species with which a plant has the potential to exchange pollen. For example, if your cabbage and your broccoli flower at the same time, the seed will produce few plants that look like either of them. Allowing only one variety of each potentially cross-pollinating vegetable to flower out eliminates the need to separate plants from each other. As well, barriers can be erected or planted, plantings can be staggered or crops can be covered with garden fabric.

EASY SEED SAVING

Self-pollinating Annuals

These include lettuces, beans, grains, tomatoes and peppers. It is easy to save a diversity of them and they are very significant crops to save. A single lettuce can produce hundreds of small yellow flowers atop its stalk. The flowers become bunches of feathery little seed sites, each flower creating eight to fifteen seeds. Tomato seed saving method involves letting ripe tomatoes ferment for a few days. Beans rattle in the pods if you shake them. Some beans pods twist open and spurt their seeds on hot days, so it's important to do daily checks when harvest is close. If your thumbnail can't make a dent in the seed, the beans are ready.

Self-pollinating annuals are an excellent place to start seed saving. Lettuces, tomatoes, beans, grains and peppers can be used in lots of meals!

These following tables from the best seed saving book in Australia, "The Seed Savers Handbook", (buy it online I highly recommend it) on the following pages provide a summary of information on the rest of the species.

For the beginner
* For the gardener with experience
** For the accomplished seed saver
*** For the expert seed saver

* Amaranth	Eschallot	* Peruvian Parsnip
* Artichoke	Fennel	* Poppy
* Asparagus	** Garland Chrysanthemum	* Potato
* Basella	Garlic	* Pumpkin
Basil	Garlic Chives	* Queensland Arrowroot
Bean	* Ginger	** Radish
** Beetroot	* Gourd	* Rhubarb
* Bitter Gourd	* Gramma	* Rocket
* Borage	** Guada Bean	** Rockmelon
Broad Bean	* Hibiscus Spinach	* Rosella
* Broccoli	* Hyacinth Bean	* Rosemary
*** Brussels Sprouts	* Jerusalem Artichoke	* Runner Bean
** Cabbage	** Kale	Sage
* Calendula	** Kohlrabi	Salad Burnet
* Cape Gooseberry	* Korila	* Salsify
* Capsicum & Chilli	* Leek	** Silver Beet
** Cardoon	Lemongrass	Snake Bean
* Carrot	Lettuce	* Sorrel
** Cassava	Lima Bean	* Soya Bean
** Cauliflower	* Luffa	** Spinach
** Celeriac	Marigold	* Spring Onion
* Celery	* Marjoram	* Squash
* Celtuce	* Mint	* Sunflower
* Chervil	* Mitsuba	Sweet Potato
* Chicory	* Mizuna	* Taro
Chilacayote	** Mustard	** Tarragon
* Chinese Cabbage	** Mustard Greens	* Thyme
* Chives	Nasturtium	Tomato
Choko	* New Zealand Spinach	* Tree Onion
** Collard	** Oca	* Tumeric
Coriander	* Okra	*** Turnip
*** Corn	** Onion	** Water Chestnut
** Corn Salad	** Orach	** Water Spinach
* Cowpea	* Oriental Cooking Melon	Watercress
** Cucumber	* Pansy & Violet	* Watermelon
* Dandelion	* Parsley	* Wax Gourd
Dill	** Parsnip	* Winged Bean
** Eggplant	Pea	Yam
** Endive	* Peanut	* Yam Bean

APPENDIX A

Pollination and Storage Table

Name of Plant	Annual, Biennial or Perennial	Manner of Reproduction – Vegetatively and, if by seeds also, Cross-pollinating and/or Self-pollinating	If Cross-pollinated are they Wind, and/or Insect-pollinated?	How many years the seeds last in good storage conditions	How many seeds to the gram
Amaranth	A	C	W	5	800
Artichoke	A,P	V,C	I	5	30
Asparagus	P	V,C	I	3-5	50
Basella	A,P	V,S		5	50
Basil	A,P	V,C	I	5	600
Bean	A	S		3	5-10
Beetroot	B	C	W&I	5	50
Bitter Gourd	A	C	I	5	12
Borage	A	C	I	5	65
Broad Bean	A	S,C	I	4	1
Broccoli	A,B	C	I	5	300
Brussels Sprouts	B	C	I	4	270
Cabbage	B	C	I	4	250
Calendula	A	C	I	2	100
Cape Gooseberry	A,P	S		3	400
Capsicum & Chilli	A,P	S,C	I	5	150
Cardoon	P	C	I	4	25
Carrot	B	C	I	3	1000
Cassava	P	V			
Cauliflower	B	C	I	4	500
Celeriac	B	C	I	5	2000
Celery	B	C	I	5	2000
Celtuce	A	S		5	1000
Chervil	A	C	I	1	450
Chicory	B	C	I	8	600
Chilacayote	P	C	I	5	5-8
Chinese Cabbage	A	C	I	5	350
Chives	P	V,C	I	1	600
Choko	A,P	C	I		
Collard	B	C	I	4	200
Coriander	A	C	I	3	90
Corn	A	C	W&I	2-10	3-8
Corn Salad	A	C	I	4	700
Cowpea	A	S		5	50
Cucumber	A	C	I	4-10	40
Dandelion	P	S		2	1000
Dill	A	C	I	3	900

KEY:

A–Annual	S–Self-pollinated
B–Biennial	W–Wind-pollinated
P–Perennial	I–Insect-pollinated
C–Cross-pollinated	V–Vegetatively reproduced

APPENDIX A cont'd.

Name of Plant	Annual, Biennial or Perennial	Manner of Reproduction – Vegetatively and, if by seeds also, Cross-pollinating and/or Self-pollinating	If Cross-pollinated are they Wind, and/or Insect-pollinated?	How many years the seeds last in good storage conditions	How many seeds to the gram
Eggplant	P	S,C	I	5	200
Endive	A	S		5	900
Eschallot	A	V			
Fennel	A	C	I	4	500
Garland Chrysanthemum	A	C	I	3	300
Garlic	A	V			
Garlic Chives	P	V,C	I	1	250
Ginger	P	V			
Gourd	A	C	I	5	30
Gramma	A	C	I	3-8	5
Guada Bean	A	C	I	2	6
Hibiscus Spinach	P	S		3	70
Hyacinth Bean	P	S		4	4
Jerusalem Artichoke	P	V,C	I		
Kale	B	C	I	4	250
Kohlrabi	B	C	I	4	250
Korila	A	C	I	3	30
Leek	B,P	V,C	I	3	400
Lemongrass	P	V			
Lettuce	A	S		5	1000
Lima Bean	P	S		3	1
Luffa	A	C	I	5	20
Marigold	A	C	I	3	300
Marjoram	A,P	V,C	I	5	12 000
Mint	V,C	I	1	1	40 000
Mitsuba	A	C	I	3	500
Mizuna	A	C	I	2	600
Mustard	A	C	I	3-7	600
Mustard Greens	A	C	I	4	600
Nasturtium	A	V,C	I	3	30
New Zealand Spinach	P	V,C	I	6	20
Oca	P	V			
Okra	A	S		5	15
Onion	B	C	I	2	250
Orach	A	C	W	5	250
Oriental Cooking Melon	A	C	I	5	70
Pansy & Violet	A	V,C	I	7 days, 1	1-2000
Parsley	B	C	I	3	200
Parsnip	B	C	I	1	200
Pea	A	S		3	5
Peanut	P	S		1	12

KEY:

A–Annual	S–Self-pollinated
B–Biennial	W–Wind-pollinated
P–Perennial	I–Insect-pollinated
C–Cross-pollinated	V–Vegetatively reproduced

APPENDIX A cont'd.

Name of Plant	Annual, Biennial or Perennial	Manner of Reproduction – Vegetatively and, if by seeds also, Cross-pollinating and/or Self-pollinating	If Cross-pollinated are they Wind, and/or Insect-pollinated?	How many years the seeds last in good storage conditions	How many seeds to the gram
Peruvian Parsnip	P	V			
Poppy	A	C	I	2	10 000
Potato	P	V			
Pumpkin	A	C	I	3-10	4
Queensland Arrowroot	P	V			
Radish	A,B	C	I	4	100
Rhubarb	P	V,C	I	1	250
Rocket	A	C	I	2	500
Rockmelon	A	C	I	5	30
Rosella	A	S		3	70
Rosemary	P	V,C	I	1	900
Runner Bean	P	S		3	1
Sage	P	V,C	I	3	250
Salad Burnet	P	V,C	I	3	150
Salsify	B	C	I	3-5	100
Silver Beet	B	C	W	10	60-90
Snake Bean	A	S		3-8	5
Sorrel	P	V,C	I	2	1000
Soya Bean	A	S		3	5-10
Spinach	A	C	W	5	70
Spring Onion	A,P	V,C	I	2	250
Squash	A	C	I	3-10	6-8
Sunflower	A	C	I	5	10-20
Sweet Potato	P	V			
Taro	P	V			
Tarragon	P	V			
Thyme	P	V,C	I	5	6000
Tomato	A	S		4	400
Tree Onion	P	V			
Tumeric	P	V			
Turnip	B	C	I	5	300
Water Chestnut	P	V			
Water Spinach	A	V,S		3	150
Watercress	P	V,S		5	4000
Watermelon	A	C	I	5	6
Wax Gourd	A	C	I	3	10
Winged Bean	A,P	S		2	18
Yam	P	V			
Yam Bean	P	V,S		5	5

KEY:

A–Annual	S–Self-pollinated
B–Biennial	W–Wind-pollinated
P–Perennial	I–Insect-pollinated
C–Cross-pollinated	V–Vegetatively reproduced

General Harvest Notes

Seeds of most plants dry right down in field or garden. If maturity is looking dubious because of the weather or if birds are significantly munching on the seeds, you can dig up entire plants and bring them indoors to complete their drying. As long as the crop is close to maturity, the seeds will continue to ripen.

It is a good rule of thumb to let harvested seed dry for at least a few more days after being removed from the plant. The larger the seed, the longer the drying period required. Most seeds will dry adequately for home storage if spread on wax paper, newspapers, trays, plates or screens in an airy place for a few days to a week. They should be turned and spread several times during that period.

An equally good drying method is to let the seed heads or stalks dry in open paper bags for one or two weeks. The drying process can be hastened by spreading the seed in a sun-exposed room, in a non-humid greenhouse or in the sun outside if they are covered or brought in at night. Lacking sun and/or greenhouse, you can speed up drying with gentle heat so long as the temperature never rises above 38°C.

General Storage Notes

Seed should always be stored under cool, dry conditions. Temperatures well below freezing will not harm seeds if they have been adequately dried. Further this is a great way to kill pests like weavils and other insects. Sealing most seeds from air, except in the case of beans and peas, which like some air circulation, prolongs viability.

Most sound vegetable seeds, if stored properly, will remain viable for many years, with the exception of short-lived onion, leek, corn and parsnip seed. The previous tables give a guide on each type. Put each kind of seed into its own envelope with the cultivar name and the date of storage. You can also put envelopes or just the seeds in airtight tins, glass jars or plastic containers that can be closed to make them moisture proof. Storing seed containers in the freezer will increase longevity.

Where to get Open Pollinated Seeds or Heirloom Seeds

There are lots of Australian companies, most are over east though so it's a mail order or online buying process. Two local sources are **Greenhouse Organic** (Seedlings and Seeds) and **Yilgarn Drylands Permaculture Nursery** so try them first and support local. Seeds can be ordered online or look at Absolute Organic, Green life Soil company and other organic food outlets.

There are lots online. Basically put this in your search engine **"open pollinated seeds .au"**.

Phoenix seeds PO Box 207 Snug Tasmania (Australia) 7054 Tel : 03 6267 9663 Fax : 03 6267 9592

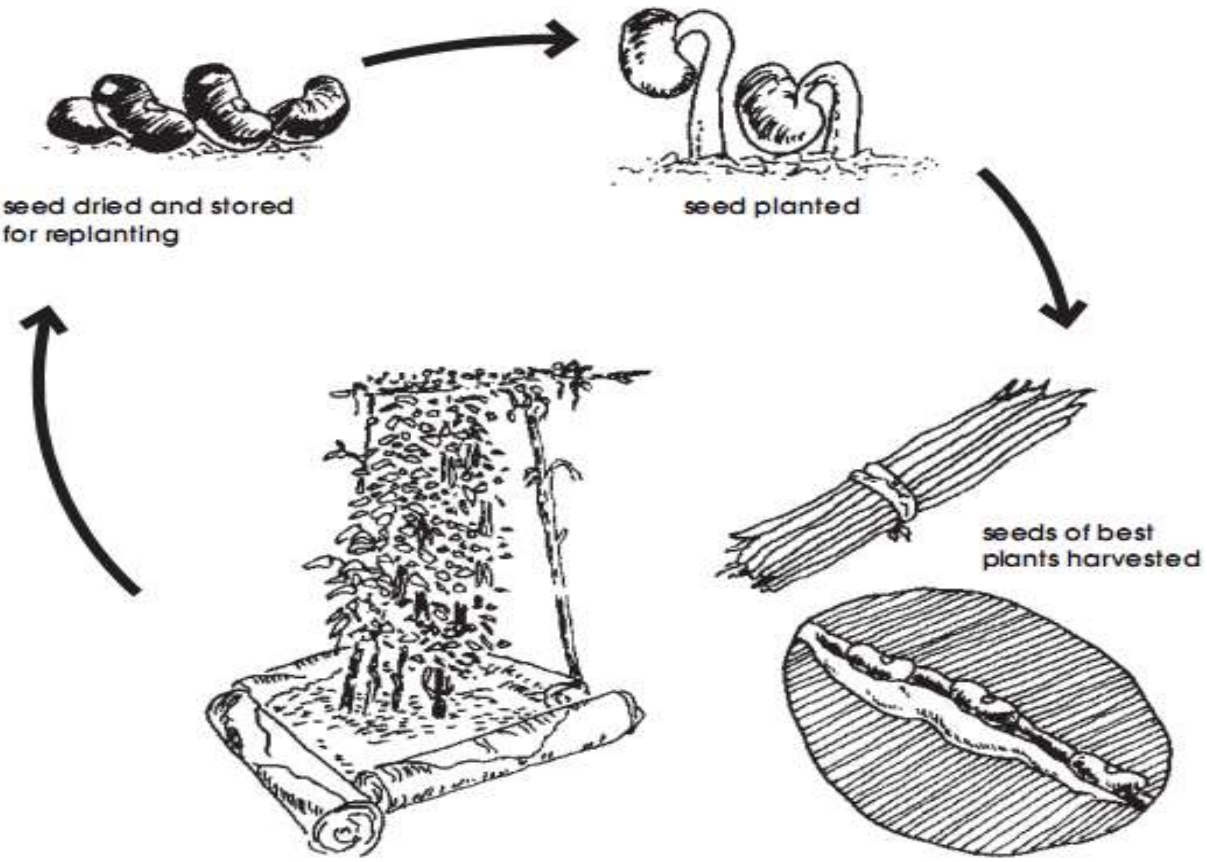
Diggers : http://www.diggers.com.au/ , Green Harvest: http://www.greenharvest.com.au/

Eden Seeds and Select Organic: http://www.edenseeds.com.au/ http://www.selectorganic.com.au/

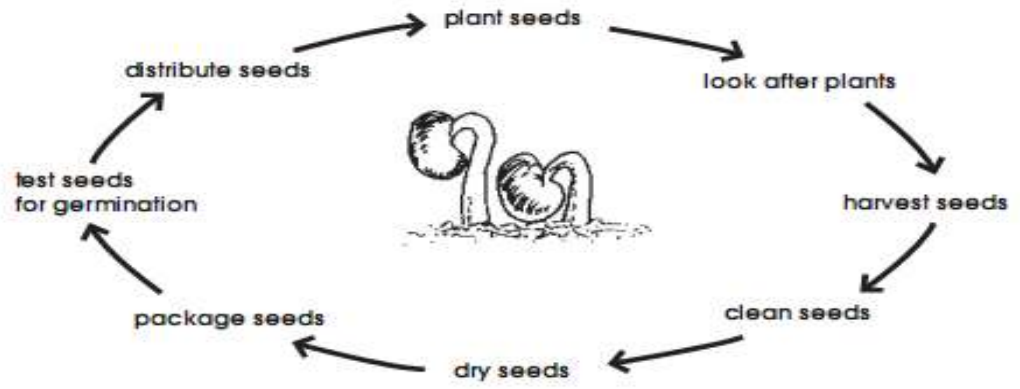
The Italian Gardener: http://www.theitaliangardener.com.au/ Cornacopia: http://www.cornucopiaseeds.com.au/

The Lost Seed: http://www.thelostseed.com.au/

The seed saving cycle



Seed production flow chart



Growing Seedlings

Use some loose soft fine soil and plant seeds as per the instructions on the packet. Don't plant them to deep. Choose seeds following the "what to plant when guides".

Perth has a tricky climate most things grow most of the time. I recommend people plant a few seeds/seedling of each type each month so that yearly/seasonal variations can be allowed for.

Essentially the plant will grow well when the season is right. Another method my preferred is sow a few of all you seeds in your open bed now (at any time) and they will germinate when they are ready.

Crop	Transplanting Tolerance	Time to grow (b) (weeks)	Frost Susceptibility
Broccoli	Survive well	5-7	Tolerant
Brussels sprouts	Survive well	5-7	Tolerant
Cabbage	Survive well	5-7	Tolerant
Cauliflower	Survive well	5-7	Tolerant
Cucumber	Seeded in container (a)	3-4	Very susceptible
Eggplant	Require care	6-8	Very susceptible
Lettuce	Survive well	5-7	Tolerant
Muskmelon	Seeded in container (a)	3-4	Very susceptible
Onion	Survive well	8-10	Very tolerant
Pepper	Require care	6-8	Susceptible
Squash	Seeded in container (a)	3-4	Very susceptible
Tomato	Survive well	4-7	Susceptible
Watermelon			
Regular	Seeded in container (a)	4-6	Susceptible
Seedless	Seeded in container (a)	6-8	Susceptible

(a) These crops are generally not successfully transplanted unless started in containers (such as peat pots), as any root disturbance checks growth.

Self seeding gardens and plants.

The more I read and experience the more it is clear that the best seedbank is in the soil, the one mother nature uses. If you can get strong localized plants they will geminate as the call of nature dictate rather than we guess. You will find that self seeded plants will generally do much better as long as they are fed and watered. A self seeded plant not only comes up when it needs to but often where it needs to so the benefit is two fold.

Growing guides are just that guides, and even local ones made the year before may not suit the following year due to large climate and yearly temp and rainfall variations in WA. Use them as a guide, document your own results at your location. And Good luck !!! Cheers Charles Otway

VEGETABLES Seed Growing (**Eden Seed's guide**)

	Row spacing (cm)	Plant spacing (cm)	Depth (cm)	Mild Perth,	Subtropics Costal	Number of seeds per gram	Best Soil Temp °C	Average days to maturity
Amaranth	50-75	50	.5	Sep-Mar	Aug-Apr	900	16-30	50
Artichoke	200-240	160-180	1-2	Aug-Nov	Aug-Nov	22	15-18	300-400
Asparagus	90-120	20-35	1-2	Aug-Nov	Aug-Nov	23-28	16-30	2-3 years
Bean, Broad	60-90	15-25	5	Mar-Jul	Mar-Jun	5-1	6-24	90-120
Bean, Bush	50-60	8-15	2-3	Sep-Feb	Aug-Apr	2-4	16-30	55-70
Bean, Climbing	100	10-20	2-3	Sep-Jan	Aug-Apr	3-4	16-30	65-80
Beetroot	45-60	5-10	2	Jul-Apr	Any	50-90	8-30	55-70
Broccoli	50-60	35-50	.5-1	Sep-Apr	Feb-May	175-330	7-30	60-90
Brussels Sprouts	100	45-60	.5-1	Dec-Apr	Feb-Jun	225-300	7-30	85-95
Buckwheat	Broadcast	Broadcast	.5-1	Jan-Oct	Feb-Oct	30		30-45
Burdock	60	50	1-2	Sep-Apr	Aug-May	50		120
Cabbage	50-75	35-60	.5-1	Any	Any	20-380	10-35	60-110
Capsicum	100-150	50-60	.6	Aug-Dec	Aug-Mar	120-160	18-35	70-90
Carrot	25-30	2-5	.5-1	Sep-May	Feb-Nov	600-900	10-30	65-90
Cauliflower	60-100	45-60	.4-.6	Dec-Apr	Jan-Apr	240-420	10-30	110-155
Celeriac	45-80	15-30	.2-.5	Sep-Dec	Mar-Oct	2100-3000	8-21	90-120
Celery	45-80	15-30	.2-.5	Sep-Dec	Mar-Oct	2100-3000	12-21	120
Chilli	90-120	40-50	.6	Aug-Dec	Aug-Mar	130-190	18-35	65-80
Collards	50-100	40-50	.5-1	Feb-Apr	Mar-Sep	300	8-30	60-80
Corn, Maize	60-90	20-30	2-3	Sep-Feb	Aug-Mar	2-4	16-35	100-150
Corn, Sweet	60-90	20-30	2-3	Sep-Feb	Aug-Mar	4-7	16-35	80-100
Cucumber	120-150	40-60	1	Sep-Feb	Aug-Mar	30-40	16-35	60-70
Eggplant	80-90	50-80	.5-.8	Aug-Dec	Aug-Mar	200-250	24-32	90-110
Endive	45-60cm	20-30cm	.5-1cm	Sep-Apr	Mar-Jul	700-1000	15-25	70
Gourd	150	90-120	2	Sep-Dec	Aug-Jan	10	20-30	95-120
Herbs, Parsley	50-60	20-30	.5-1	Sep-May	Feb-May	500-650	10-30	65-135
Kale	50-100	40-50	1	Mar-Apr	Mar-Jun	250-370	8-30	50-65
Kohl Rabi	35-40	10-20	.5-1	Aug-May	Mar-Aug	250-350	8-30	55-70
Leek	30-75	10-15	.5-1	Aug-Apr	Jan-Mar	350-450	8-30	105-130
Lettuce	35-50	20-30	.6	Any	Any	600-1200	8-27	60-85
Luffa	150	45-75	3	Sep-Dec	Aug-Jan	6	20-30	80
Marrow	100-120	90-120	2	Sep-Jan	Aug-Mar	6-8	20-35	90-120
Mustard Greens	50-75	35-60	.5-1	Any	Any	300	10-35	40-60
Okra	90-120cm	35-60cm	1cm	Oct-Dec	Aug-Feb	15-25	20-35	80-98
Onion	30-40	5-10	.5-1	Feb-Aug	Feb-Jul	240-400	8-30	180-240
Parsnip	35-50	8-10	.5-1	Jul-Mar	Feb-Sep	230-400	6-21	120-140
Pea	45-60	5-8	2-3	Feb-Sep	Mar-Jul	3-5	8-24	65-80
Pumpkin	250-300	90-120	3	Sep-Dec	Aug-Feb	5-12	20-32	105-140
Radish	25-35	3-5	1-2	Any	Any	100-140	8-30	40-50
Rhubarb	60-70	40-50	1.2	Aug-Jan	Aug-Feb	60		
Rockmelon	120-150	40-60	1-2	Sep-Dec	Aug-Feb	25-40	20-32	75-115
Rosella	90-120	45	1	Oct-Feb	Sep-Mar	50-70	24-32	175

Salad Greens, Endive	45-60cm	20-30cm	.5-1cm	Sep-Apr	Mar-Jul	700-1000	15-25	70
Salsify	20-40	5-10		Aug-Mar	Mar-Oct	60-80		110-180
Shallots	20-30	2-3	.5	Feb-Sep	Feb-Sep	350-480	8-30	85-105
Silverbeet	50-60	15-30	1.5-2	Sep-May	Any	50-60	10-30	50-85
Squash, Button	90-120	60-80	2-3	Sep-Jan	Aug-Mar	7-12	21-35	50-60
Sunflower	50-100	20-30	1-2	Aug-Jan	Aug-Apr	7-15	15-30	70-80
Swede	45-70	10-20	1	Jan-Apr	Jan-May	380-480	15-30	70-75
Tomato	60-150	40-60	.5	Aug-Dec	Aug-Apr	250-400	16-35	60-120
Turnip	30-50	12-20	1	Sep-Apr	Aug-May	400-500	12-30	45-65
Watermelon	150-200	60-75	2-3	Aug-Dec	Aug-Feb	10-20	21-35	68-100
Zucchini	90-110	50-90	2-3	Sep-Jan	Any	6-12	21-35	44-63

Greenlife Soils "what to Plant When Guide" –Search "Greenlife Soils" to find their great website

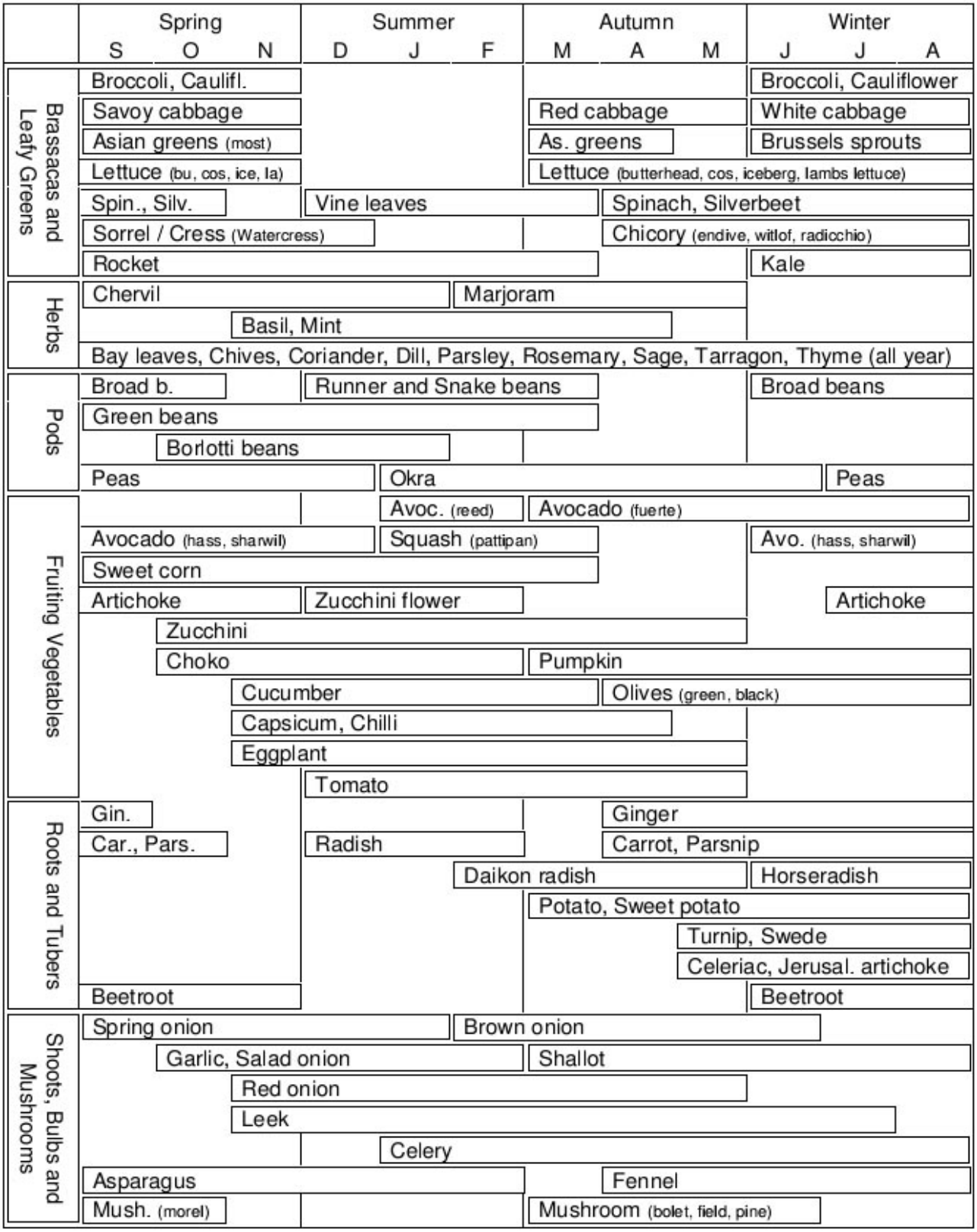
Growing more food with less work and cost

Think about how you use the plants, and are they annuals or perennials, if possible grow plants that don't require you to kill them in order to harvest their food. Loose leaf crops can be harvested each week just leave enough leaves for the plant to produce its own food. In this case figure out how much you need and how fast it grows, one kale plant won't give you leaves every day but 3-4 will be enough for greens a few times a week, a family might want ten kale plants to give 2 raw/cooked feeds a week and some mixed salads greens.

Not having to plant new seeds/seedlings each time you crop reduces the wait and the cost of growing your own, that is why having perennial replacements for common annual veggies is a great idea. Chilacayote and Choko's to replace melons and squash, Kale to replace cabbage, multiheading broccoli to replace single heads, garlic chives and shallots to replace onions and garlic.

What to Grow When

Vegetables



This is the mainstream market garden seasonal food production schedule. It's a guide to what you can do but don't let it limit you as we can do much better than market gardens.

Most annual food crops take around 2-3 months to produce their food. Perth has a very moderate winter so most plants can be grown all year round, those suited to winter produce more food then, those that like heat will produce less. Basically temperatures above 35oC in summer kill 'winter' plants and light frosts/cold nights in winter kill 'summer plants'.

Fruiting/Producing only in summer – Corn, Basil, Tomatoes, Mellons/Squash. Also Eggplants and Capsicums but note though the plants might last 3 years (perennial) just not fruit in the cold.

Best Food Plants for Perth

WINTER

More simply once the heat is gone from autumn, around March, plant and water the following seeds for winter food.

Kale – Due to its easy to grow nature, continual harvest, high nutrients and low oxalic acid leaves Kale is the best winter green, a must have. Flat leaved varieties have less aphid issues.

Dandelions, English the leaves and yellow flowers are used in salads, buy one in a pot if you need to it will set lots of seeds and give you many new selfseeding, free greens. Very healthy mildy bitter add a few to salad and you wont notice. Free food even in poor soil in winter rains.

Broadbeans (eat tips if the pods don't set, tips are like bean sprouts, new braces come up from the roots, a healthy big broadbean might have 5-10 stalks, so use for of those.

Chicory – Loose leaf (red Ribbed Chicory and green), head forming witloff types, lots of nutrients in them

Potatoes – As long as you don't get a frost winter is the best and only time when Potatoes are better producers than sweet potatoes. Plant large manured beds with Royal blue variety for a good harvest. Pick healthy looking small spuds at an organic store for a cheap alternative to 'seed spuds'. Other varieties are ok but I find Royal Blue suits home growers, plant a cut spud with 2-3 eyes or whole spuds in a 10cm deep furrow. I don't find excessive mounding (stacking, wire towers etc) work for me. Mound up a little as it grows your should get 3-4 spuds at least per plant in 3 months.

Chickweed – A common weed, often cursed by those that don't realize it's a tasty nutty very nutritious food crop. Free food self seeding every year. Eat your weeds !!

Peas, both snow and podded are a great winter crop, they do grow when it warmer but tend to get viruses and struggle in the heat. That is the time to move to beans. I don't bother with podding peas as snow peas avoid the waste and wait. I grow Rio De Carboy a large climbing red flowered huge snow pea, it's a very strong producer to most store bought white snow pea varieties. There are also purple pod and yellow pod snow peas, and as they are great fresh/raw the kids will love the colours and crunch. Most peas need a trellis and I find light weld mesh is best, run your row east west and plant the peas on the south side of the wire/strings as they grow towards the northern sun.

Nasturtiums – Vigorous growers to the point of smothering everything, use these as a winter mulch to stop other less desirable weeds, yummy stunning flowers, edible leaves (use like mustard below). This plant can be trellised to avoid it smothering if needed. Use some leaves everyday and just try and out eat it.

Mustard Greens – Large Green and Red Mustard plants, leafy varieties (not the mustard seed producers) grow vigorously even in poor soil, a great trap/distraction crop for pest and a nice hot (wasabi/horseradish

like) addition to salad or with your meat.

Silver beet, Chard and Beetroot – Best to grow in winter as its not very sun and heat tolerant. 2 months and you will have all the spinach (cooked with salt) equivalent you can use. Plant 20 cms apart as they grow large. Even if you don't like it use it in quiche, soups, stirfry, soup its got great iron and other minerals. I don't bother with spinach any more. Multicoloured chard and beetroot tops are a tasty equivalent when its to hot for large leafy silverbeet.

Asian Greens – Easy, Grow very fast and provide a good yield though I don't bother with them as we don't use/buy them.

Garlic – Plant on the shortest day and harvest on the longest is the general rule. Buy cloves of local purple garlic, split and plant each clove to create a new plant. It's a long wait but much easier to grow than onion from tiny seeds. Garlic is a bit tricky to grow but a super healthy plant that your family needs, the sulphur in garlic keeps all sorts of bugs out of your body.

Herb Robert is a average tasting but exceptionally beneficial medical herb, look it up. It self seeds freely in winter and grows over summer in Perth (rare for good medicinal herbs) as a bushy geranium. Simply eat 2-3 leaves a day with something that tastes good to give more benefit to you and the family than any multivitamin pill. Combine this with easy growing **alovera** and you have a pharmacy as well as a greengrocer in the backyard.

SPRING

All the mentioned winter crops should still be providing food in Spring but now is the time to plant summer annuals and perennial plants. Spring wamth offers the best time to grow most herbs from seed and with seed of herbs and cuttings etc.

Plant

Sweet potato runners should be planted now, in good soil you should have tubers in 3 months in poor soil more like 6 months. You know I love sweet potatos, it is the highest yielding staple summer crop in Perth. Edible tubers, edible leaf tips, trelisable shade, summer hardy and a summer mulch this is an amazing plant that everyone should grow. 3-4 varieties are worth growing but I find the purple skin white flesh (heat shaped leaf) variety yields best. These are also perennial you just scratch around in the soft soil carefully looking for tubers, the plant is killed off to tubers if there is a frost otherwise they just look tatty in winter.

Squash, pumpkins and cucumbers if you have the space. Lebanese cucumbers can be trellised up to provide tasty ongoing small cucumbers. A perennial squash **Chilacayote** has replaced Zuchini and Squash in my garden, it is very vigorous and produces well in Autumn, Winter and Spring, but doesn't like summer heat. The choko vine is similar, slow to start then heavy bearing but not fond of summer sun. For summer I grow **New Guinea bean** another vigorous climber that likes the summer heat. I grow these as they are climbers (vertical stacking) and less susceptible to mildew which is a crop destroyer of most squash each year with water on the leaves from rain, poor ventilation or top watering.

Water mellons and Rockmellons will grow but require more effort, space and water so are low priority. Try berries and fruit trees first for this sweet fruit.

Tomatoes, Capsicums and Eggplants – Tomatoes should be planted in fresh heat treated compost and coir and kept off the soil (a air gap or water gap) as most perth soil has viruses that ruin tomato crops (Rusts and wilts). All three might need to be netted for eggplant caterpillar a fruit fly like grub that bores into the fruit

and sometimes stalks of potatoes as well. Given this need to net in summer (the pest is a warm weather pest) it is worth grouping the plants together.

Corn is worth planting in large blocks (wind pollinated) IF you have the space and high fertility garden beds. I grow **Jerusalem Artichokes** instead as they are hardier, have less pests, higher yield for a similar space. Jerusalem artichokes need cooking to reduce inulin levels to reduce 'wind' but are a high yield later summer/autumn crop when most other things are recovering from summer.

Clumping leeks, shallots and onions are good to source and get in the ground now. I don't bother with bulb onions (brown ones in the shop) as they are hard to grow from seed and are a long maturity crop, instead I grow Garlic chives, Mosselburg leeks, shallots, and clumping onions. I do buy a few onions for some meals but normally that great onion flavor comes from freshly picked onion greens. When you buy shallots just use the green tops and plant the white stem and roots, do that each week for 2 months and you will have healthy shallots. With these ten or so clumps/rows you can be picking leaves as required for the rest of the year for free.

Dwarf and Climbing beans, of all sorts produce and easy and prolific harvest. They need to be picked every day to stop the mature beans signaling the plant to stop producing. I find climbing beans especially purple king do very well here but a combination allows you to use vertical space and horizontal space, but don't plant next to each other. Bush beans are meant to do better now with runner beans better in autumn. Remember these are legumes and nitrogen fixers they don't need the best most fertile soil and they can be companion planted with a heavier feeder of complimentary growth habbit.

Planting some **salad burrett, sorrel, lovage, musk mallow and Moringa** will also increase the diversity in your greens and increase the perennial side of the salad bar,

SUMMER

Summer is a great time to have a pond or few water feature barrels. These can be heavily planted with aquatic food plants to both provide you with food and keep the water fresh and oxygenated without a pump. Water parsleys, Kangkong (aquatic sweetpotato), water cress, brahmi, Pickerel Rush, Vietnamese Mint, Water Chestnut.

Many people are also setting up cheap aquaponics fish tank and growbeds from IBC's. While I don't thin they are a safe way to produce food (lots to go wrong) they are very good in the summer heat from producing fast growing healthy greens. The soiless media in the grow beds is like soil so many more plants (not just aquatic) can be grown compared to the safer more stable pond/barrel option.

The is not much point planting seeds or tender seedlings in summer, November to Feb its just to hot unless you have a well shaded moist area. Dappled shade under a tree or 30% plus shadecloth allows you to grow most leafy greens still.

In summer I enjoy the shade of my trees, the airconditioning of my garden, harvest food from hardy sweet potatoes, ponds edibles and a few Kale and a few other hardy summer plants.

Winged Beans, Snake Beans, Jicama Yams and Malabar spinach, are all heat loving short season summer crops worth a go too.

Fat Hen, Lambs Quarters, or Old King Henry are all very similar species. They can be weedy but will grow through summer unlike most other salad greens, they also can grow to 1.8 m and provide tree like dapped shade underneath. Leaves replace lettuce in summer as a staple salad green, so this is a must have summer

self seeding annual to me. I planted it once and now I have free food in the heat of summer when most other people are struggling to keep lettuce and other less nutritious plants alive.

Often in summer the best option can be to plant some sweet potatoes and heavily mulch the bed with street tree mulch, water once a week if required. Pretty much your letting the bed rest over summer when it is a waste of water and effort to grow food in sunny spots. This keeps the soil healthy and rebuilds it with the mulch breakdown. When summer is over dig up your sweet potatoes and pop in a autumn/winter crop into the happy soil.

Autumn –

Runner beans, as mentioned big crop for little work but they do need something to climb. Try and teepee with 3-4 sticks and beans planted around the outside. The kids can play in the shady middle. Beans climb fine up strings as the wind around unlike peas who have short finger like hands that needs mesh instead.

Carrots though not mentioned before can grow all year round. Depending on your garden bed type you might want to go for heritage short varieties as the long ones might not like wicking beds water down below. Let a few go to seed and you will have hundreds of seeds for next time. The trick with carrots like many things is to plant a few 1-2 rows every few weeks, that way you get a continual maturity without a glut or the risk of ending up with old woody harvest.

As we said before once it cools down in autumn its time to plant replacement winter perennials that may have been killed in summer or its just time to divide the clumps. Most perennial veggies tend to clump or reproduce a lot close to the parent by seeds. In time the plants are to many and to get decent sized plants or to start in new fertile soil you need to dig up, separate and move. Strawberries, leeks, dandelions, sorrel, artichokes, asparagus, etc all need this.

A great book (essential reference) is Seed Savers Manual by Michael and Jude Fanton, this covers all you need to know about 117 varieties of food plants.

All year round and Perennials –

There are many great food plants that fit in this category, Alovera mainly herbal is an essential medicinal treasure chest, look it up. There are several varieties some don't like full sun and other thrive in it, make sure you keep and eye on it for a few weeks. Asparagus, strawberries, bramble berries, Kale, Moringa, Taro, Arrowroot, Banana's, most fruit trees and bushes. This is a bit beyond the scope of this session as the grower needs a lot more knowledge about each plant to have success. Treat large perennials as per fruit trees, seek advice from the seller/grower that you get them from.

Easy Fruit Trees

Many fruit trees are hard work so I don't advise starting there in your food growing adventure, but if you do want to get some start with Guavas, especially cherry/strawberry bear well and for long periods giving excellent source of vitamin C in winter when most needed. Oranges also do well in Perth, a Navel and Valencia will allow you to get oranges for 4-5 months of the year. Lemons are useful for so many things, fruit juice, food additive, and cleaner you need lots.

Fruit trees

Know that just because a tree or plant is available for purchase here it doesn't mean it is well suited, or will be able to cope with local conditions without unnatural support, or will bear fruit. Developing a definitive list of Mediterranean species suited to Perth conditions is a long term project that is still only just

beginning.

As with any permaculture plant system, the first consideration is diversity and resilience in plant selection. We need trees that are tolerant of sandy soil, low chill winters (that means less than 300hrs of temperature below 7 degrees Celsius) and hot summers.

Consider the permaculture principles of intrinsic needs and functions – what else can be achieved with our fruit trees. How can we use the functions of shade, screening, windbreak (eg olives), fodder, prunings for stakes and compost etc. What will they need? Water, fertiliser, mulch - where will that come from? Are there enough support species and small livestock to at least supplement these needs?

Pests

We have our own local pests, not the least of which is the very famous and prolific Western Australian parrot species, capable of unlimited appetite and destruction, and of course fruit fly.

So choose wisely. Parrots are voracious eaters of unprotected pome and stone fruits, so these trees if selected should be pruned to small manageable sizes for netting. Conversely parrots don't seem to eat citrus, and olives, so these trees can be grown without specific bird protection

Fruit fly however, does like citrus, and most stone fruits especially apricots, peaches, nectarines and plums. These trees will need a fruit fly strategy such as chicken access during fruiting season, and therefore some flagstones or pavers to protect the root zones, fencing etc.

Naturally the whole system, not just the orchard, will have flowering herbs and understory selected for IPM on year round basis. The is more on integrated pest management (IPM) in other workshops by Terra Perma.

Pollinators

This has two meanings in fruit tree cultivation. Firstly another tree of the right variety may be required to fertilise flowers for fruit set, and secondly the right vector species such as bees or other insects to help the delivery of pollen to the flowers. Many trees are self-fertile and therefore perhaps more desirable in smaller areas where space is an issue. Other possibilities are double plantings and multi-grafted trees

Varieties

On the coastal plain steer towards the sub tropicals and very low chill listings and in the hills also select medium chill. WA climate is trending warmer so even the low chill may not bear in the 5-6 years it takes your tree to mature. As mentioned pollination, pest control, exclusion netting, pruning and other issues mean you need to do some homework before spending money and garden space on fruit trees.

For some inspiration here what is possible on an urban block at Jetto's Patch Yearly Fruit Harvest

2012 Fruit Harvest at Jettos Patch http://www.facebook.com/#!/groups/JETTOSPATCH/

AUTUMN - MARCH

Lemons, Figs, Rhubarb, Jujube, Passionfruit, Bell Apple, Red Globe Grapes. Barbados Cherries, Lillypilly, Pomegranate (wonderful), Grapefruit (Marsh's Seedless), Crab Apple,Passionfruit, Mango, Elderberries, Red Globe Grapes, last Blueberries, Pears, Tamarillos, Almonds, Peanut Butter fruit, Miracle fruit, Watermelon

APRIL

Lemons, last Figs, Rhubarb, Passionfruit, Bell Apple, last Red Globe Grapes, Barbados Cherries, Lillypilly, Pomegranate (wonderful), Grapefruit (Marsh's Seedless),Passionfruit, Mango, Elderberries, Red Globe Grapes, last Blueberries, Pears, Tamarillos, Almonds, Bananas, Quince, limes, apples

MAY

Lemons, Grapefruit, Guava, Feijoa, Lillypilly, Pomegranate, Rhubarb, Jujube, Limes, Midginberry, Mandarin, Barbados cherry, Pineapple, Bananas, Tamarillos

WINTER - JUNE

Lemons, Grapefruit, Guava, Pomegranate, Rhubarb, Limes, Lillypilly, Jujube, Feijoa, Tangello, mandarin, Valencia Orange, lemonade, Medlars, Seville Orange, Cumquats, Dragonfruit, Bananas

JULY

Lemons, Pomegranate, Rhubarb, Guava, Limes, Lillypilly, Jujube, Grapefruit, Feijoa, Tangelo, Mandarin, Valencia orange, Lemonade, Cumquats, Medlars, Bananas

AUGUST

Lemons, Grapefruit, Limes, Cumquats, passionfruit, Bananas

SPRING - SEPTEMBER

Lemons, Alpine strawberries, Strawberries, Loquats, Rhubarb, Limes, Grapefruit, Mulberries

OCTOBER

Lemons, Alpine strawberries, Strawberries, Loquats, Rhubarb, Limes, Grapefruit, Mulberries, winter passionfruit, Bananas, Tamarilos, Fingerlime, Misty/ Nellykelly blueberries

NOVEMBER

Lemons, Alpine strawberries, Strawberries, Rhubarb, Limes, Blueberries, Cape gooseberries, Cherry plum, Apricot Newcastle, Peach

SUMMER - DECEMBER

Lemons, Alpine strawberries, Strawberries, Rhubarb, Barbados cherries, White Sapote, Ladyfinger grapes, Limes, Blackberries, Bramble berries, Blueberries, Cape gooseberries, cossack pineapple, Nelly Kelly black grafted passionfruit, Silvanberry, thornless blackberry

JANUARY

Lemons (Eureka), Rhubarb, Figs (Black Genoa), Passionfruit (Nelly Kelly black grafted and Tutti-frutti), Strawberries (Red gauntlet), Lady Finger grapes, cape gooseberry, cossack pineapple, Blueberry (northland), thornless Blackberry, Boysenberry, Heritage Raspberry, Barbados cherry

FEBRUARY

Lemons, Figs, Rhubarb, Jujube, Passionfruit, Bell Apple, Red Globe Grapes, Barbados Cherries

For more information see Perth Fruit Tree expert Peter Coppin's website on care and varieties of fruit trees. http://www.petercoppin.com/

Also DAWSONS – http://dawsonsgardenworld.com.au/fruit.htm

And Flemings - http://www.flemings.com.au/

Tass1Trees is the first place I check for trees - http://www.tass1trees.com.au/