INCOMPLETE

GUIDE TO ORGANIC FARMING

VEGETABLES
HERBS
FRUIT
POULTRY
LIVESTOCK

Haji Hanif Manjoo - BA (UNISA)

Hi All! This book is being distributed FREE OF CHARGE to promote Organic Farming among our people!
NOT TO BE SOLD!

Please read and teach others!

INCOMPLETE GUIDE TO ORGANIC FARMING

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We support all communities; townships, urban, rural, schools, masjids, churches, temples, etc.
We also have demos at Shopping Centres, Expos, Women's/Pensioners, etc.
Free Seeds, Compost/Potting Soil handed out for recipients.

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Guide to Organic Farming
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Dedicated to Humanity!

Special mention of:
Rev. SP Naidoo, Sister Aashiya Saloojee (Attorney, Lenasia)
Sister Safeeyah Moosa (Spiritual Chords), Imthiaz Jetham (SANZAF, Jhb), Zeinoul Cajee, Farouk Limalia and AK Methair (of AwqafSA)
My family members: Ahmed Saber Manjoo, Fatima Mookadan, Khatija Cassim, Rushda Ganey, Fazila Wadvallah, Farida Coovadia, Firdose Vally…and a host of supportive family and friends.

CHAPTER 1

1. FOREWORD

As the title indicates; 'Incomplete Guide to Organic Farming'. This book is not an exhaustive treatise on every aspect of agriculture. It is to inform, whet your appetite and set you on the road to self-sustenance; from your backyard to a farm. In years gone by, a thick, gold-lettered cover bound Agriculture and Livestock Annual on each, with gloss, full-colour pages, covering in detail every aspect, was published periodically by the Department of Agriculture. This publication is nowhere near those. Fortunately, we have internet from which we can glean much more information. RIP, Agri-Annual/Year Book… Sadly missed!

*NB: While every attempt has been made to acknowledge sources, some have been passed on to me by friends and colleagues. Those that were approached, have not responded. Nonetheless, credit is given in our acknowledgments/references.

With agriculture, our ancestors (Europe, Asia, the Americas, Africa…), as agri-pastoralists, survived for thousands of years with organic food that the land provided. It was over considerable time that they distinguished and isolated those plants that were edible, medicinal, etc. Within this agri sector, it is in sharing and learning from each other as well; it's not the degrees or doctorates as much as the cumulative experience and learning over thousands of years.
Our knowledge, experiences, and traits are hereditary, within which we traverse and transfer, develop, embellish, and advance from generation to generation.

In reality; nothing is new! Just like America and other countries; they were not discovered…
THEY WERE THERE ALL ALONG!

Included are the numerous referenced websites that provide additional volumes of agricultural tips and guides. Google/visit the internet sites; listed are sources for further info- Living Seeds, GrowVeg, Mother Earth News, Gardens&Homes, Farmer's Weekly, Express, Forbes, The Spruce, and others, including overseas publications websites, and contributors… many as ordinary as you and me!
Please note, that some of the articles may be for the northern hemisphere; so, adjust accordingly for the southern hemisphere- when it's summer here, it's winter there!

What is Permaculture? *It can be understood as the growth of agricultural ecosystems in a self-sufficient and sustainable way. This form of agriculture draws inspiration from nature to develop synergetic farming systems based on crop diversity, resilience, natural productivity, and sustainability. 04 Feb 2019- Google*

Our emphasis is on organic, responsible agri-techniques, and, promoting sustainability, as our ancestors.
Today, there are a whole lot of new techniques and terms in the agricultural sector that we are faced with; new technology, methods, developments, machinery, ideas, scientific terms, etc.
We just need watch and come to terms with them; start with the simplest.

It is said, give the rod (or pick and hoe for farming) to communities to catch fish and feed themselves, **BUT**; Rather train and educate communities on how to bind the eyes on the rod, what type of bamboo, the fishing line (cotton, nylon, hemp or leather) and its strength, which fish and size, what type and size of hook, bait for sea and rivers, how to cast, where to fish, even the spices and how to cook the fish, etc…!
Effectively, the whole gamut in terms of education and product knowledge; the features, advantages, and benefits of organic farming.

By perusing this manual, compiled from articles of various experts and not-so-experts, sources, social media groups, my own experiences, interviews, and others, you will be well motivated to start your organic vegetable patch and, hopefully, into other aspects of farming; …or just simply; traditional farming.

2. OVERVIEW:

Science vs Organics

Conventional Farming vs Biological Farming, Bontera SA, February 2024

Conventional agriculture

"The system of agriculture that has become known as 'conventional farming' has only been for about 70 years. The heavy use of highly toxic chemicals and synthetic fertilisers is a post-World War Two phenomenon.

"On the surface, the results of what we call the conventional farming system seem good. We are producing way more crops now than ever imagined 100 years ago. But what about the long-term effects - the hard, dead soil, the poisoned groundwater, the increasing pest problems, climate changes? Or the fact that most commercially grown fruits and vegetables must be rushed to market before they spoil? What happened to quality produce? ***Are we sure that there isn't a better way?***

"The basic philosophy of our modern agricultural practices is exploiting natural resources for economic gain. We need to control nature so that we can produce more. If other plants interfere, we need to kill them. If we see an insect in our field, we must eliminate it. (Maximise profits, minimize costs!)

"We've also learned that plants only really 'need' a few simple ions to grow. We've developed highly toxic chemicals to rid our fields of unwanted plants and insects, and we've developed ways to synthesise these essential ions to produce our plant food and make them grow bigger and faster.

Another Way

"But there is another way, another outlook on life, another agriculture system. A system that is by no means less productive, simply more humble, and respectful. It ***respects nature*** *and realises that man doesn't know it all. Plants and animals grow by* ***natural laws*** *and grow best when natural laws are followed. Life operates in natural cycles. One thing affects another; just as the antelope eats the grass and we eat the antelope, we are all part of the circle of life.*

"This system of agriculture relies on working with nature, not against it. When we give the soil the right materials, an amazing array of soil organisms do what they're supposed to, and we receive an abundance of nutritious, high-quality food. Other natural organisms and mechanisms protect against pests and diseases — automatically. All that we have to do is encourage them and then get out of their way.

"We call this system ' biological farming' as it emphasises one of its key aspects, life in the soil. Biological farming works with the natural laws and systems; our job is to try and help everything operate more effectively. A healthy, balanced soil is the foundation necessary for healthy plants. We are also not against using modern technology and new methods, but we only advocate for those that do not interfere with natural systems.

"The results of using biological methods are amazing: soil structure improves, crop yields are high, and quality improves. Biological farming embodies principles crucial for the well-being of both the environment and farmers. By prioritising techniques aimed at reducing water consumption, improving soil fertility, and enhancing food quality, biological farming fosters healthier ecosystems and cultivates higher crop yields. This increase in productivity translates to greater income and profit for farmers, ensuring economic sustainability. Moreover, biological farming serves as a cornerstone for future-proofing the food chain, safeguarding it for future generations. Central to this approach is the commitment to enriching lives while preserving land health, epitomised by the innovative optimisation of microbial communities within plants—a groundbreaking method poised to revolutionise productivity and propel agricultural sustainability into the future. Weeds, diseases, and pests almost disappear. Farming becomes fun again!"

Gert Coetzer (Pr.Sci.Nat), Head Agronomist at Bontera South Africa shares his thoughts on this concept.

The Vanishing Nutrients

'*Many of us are becoming more and more interested in growing food, so my examples often centre around that. We know that most produce from the grocery store doesn't have the nutrition it used to, and we're excited to grow our own nutrient-dense fruits, vegetables, grains, nuts, and seeds - even mushrooms, which are fungi.*

In the last half of the 20th century, pesticide use increased by 1,000%. Yet the percentage of crop loss due to insects nearly doubled. During this same period, the bulk of our topsoil has been lost. The majority of our groundwater, lakes, rivers and streams are also polluted, along with our air; ***note the water hyacinths that clogged the Hartebeespoort Dam and the Vaal River.***
Fortunately, the earth will (hopefully?) eventually repair itself, and ***we can take action right now in backyards.***
*We can vastly improve our soil and grow high-quality food. We need to, because although agriculture drastically increased the amount of food it can grow during the last 60 years, that food has less nutrition****. Some research shows that the nutrients in our food are down 60% to 70% on average*** *- The Holistic Gardening Handbook Condensed Version - www.SmilingGardener.com*

Hence, you can also have a broader perspective of the various forces in agriculture, the overall economy, and the health implications; locally and globally…the deadly games that they play, with us; the consumers!

Initially, starting from scratch, you will likely have setbacks; like most entrepreneurs! In agriculture (as with any other undertaking) it is a matter of trial and t-error!
Eventually, it is acquiring as much info and the hands-on experience that makes the difference. That is the challenge of cultivating your organic vegetables; the learning, trying, overcoming challenges, and fears…. finally, being rewarded with the harvest; the joy, thrill, and satisfaction, which cannot be measured in monetary terms!

The lifeblood of fruit and vegetable farming; ***seeds, soil, fertiliser/compost, water, and light*** with which you will get to grips with theground-breaking info here. ***Go for it!***

3. AGRI-HISTORY:

South Africa is blessed with some prime fertile land, water, and climate for agriculture and livestock. There are also large tracts that are not accessible or suitable for farming. Many have been converted to game farms or nature reserves. In other areas, the soil is unsuitable, climate issues, and worse, pollution of land and water. ***Farmers also face the malady of disease outbreaks, unexpected floods, farm attacks, with stock and crop thefts.***
This situation is linked with the neglect of the past 30 years; hardly any maintenance, monitoring and/or upgrading of our various infrastructures, dams, sustaining/protecting the soil, water reticulation systems country-wide, etc. Countries to the north of us are always busy upgrading or expanding as in Ethiopia, Libya, Egypt, and the Middle Eastern countries. The neglect in our country has resulted in this national mentality of everyone giving two hoots, unless it is free, can be taken, a tender…or an Ankole for undeclared $$$$!

Half-hearted attempts at land retribution, absence of results-orientated land and resources utilisation, poor agri-education, no planning of national water reticulation from dams, with underground tables, rivers, streams, and even the ocean simmering in sewerage, together with poorly monitored industrial and chemical pollution on land: no forward planning, major projects, etc…a veritable failed and destroyed state! Is there a Second Coming?

To promote self-sustenance and to advance our people and country, we need to introspect, be honest, and dissect our situation objectively; the constraints, negatives, and positives that devolve into our national malaise and decadence. Herein all parties in the matrix are equally guilty; the politicians, farmers, consumers, the land issue; reluctance to engage and resolve, lack of a communications channels where all are well informed and at ease, etc.

Agri-Political History

Our agri-political history from 1652, is skewed to favour a handful who own vast tracts of land over generations; either individuals, families/landed gentry, corporates, or cooperatives; a veritable albatross. Such a disclosure, discussion, and appraisal are a no-go with some of our communities and farmers!
Producers normally have contracts with the big distributors/corporates/agents for sole/preferential supply (as in America)….who are mostly colonial descendants that had the first bite on fertile land and natural resources!

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During apartheid, black/African farmers were restricted from owning large tracts of land, to form cooperatives or embark into commercial farming. Herein, the former Bantu homelands (Bantustans) are a case in point;

The 'homelands'

- Bophuthatswana – Tswana.
- Gazankulu – Shangaan and Tsonga.
- Lebowa – Pedi and Northern Ndebele.
- Venda – Venda.

* Ciskei and Transkei – Xhosa.
* KwaZulu – Zulu.
* Qwa Qwa – Basotho.

In these homelands, only small-scale subsistence farming was possible. The land that was mostly dry/ unsuitable, subject to frequent droughts, or eroded by over-grazing of livestock. Thus, the ratio of land ownership is glaring; the various indigenous (African) black tribes were herded into just 13% (yes, thirteen!) of the country's total land mass!

Consequently, blacks in general, and the majority of our citizens (black, white, and brown), have a vague idea of agriculture and what it entails. We will introduce and equip you with the various options and openings by transforming you into being a proud, self-sustaining, empowered budding organic farmer…whether you live in a flat, cottage, or plot! It means; you plant your own organic…you buy less from the chains and suppliers. That in turn translates into; less sales and the farmer dumps or drops the prices of produce, in tandem with the chains!

What do we know of Health Hazards*;*

- type of seeds (GMO specifically), that are banned in most countries?
- What are pesticides and their effects on humans?
- **What is the full form of VLP?**
  VLP stands for Virus-Like Particles. Virus-like particles are molecules that mimic viruses but are not infectious. They are a very effective way of creating vaccines against diseases such as human papillomavirus (HPV), hepatitis B, malaria, and more. News-Medical…. https://www.news-medical.net › health › What-is-a-VLP
- *Another group is looking at **food vaccines** by implanting pathogens in plant seeds (GMO) with a similar aim!*

Here, from Google…
'People filing Roundup lawsuits claim the weed killer caused them to develop cancer. In 2020, Monsanto (now Bayer) agreed to pay almost $11 billion to settle most Roundup cancer claims. In February 2024 about 4,203 Roundup cancer lawsuits were still pending in the California Roundup MDL.'

'Opponents contend that the product's key ingredient glyphosate poses unacceptable environmental and health risks.20 Nov 2023'
'Bayer ordered to pay $2.25 billion after jury links herbicide Roundup to cancer. A jury handed down a $2.25 billion verdict, including $2 billion in punitive damages, against agrochemical giant Monsanto, according to the lawyers of a man who said he developed cancer from using the company's weed killer, Roundup.27 Jan 2024'.
Stop Press*: Bayer has now announced it is changing its chemical formula of RoundUp by removing glyphosate!*

Latest: Missouri State (where Bill Gates is the largest land owner in USA), has proposed a bill that will allow mRNA vaccines to be given to livestock, (described in the Bill as Genetic Technology)….in simple terms, gene editing.

Control, Supply and Dumping
Most farmers in our country control the supply of agricultural produce nationally; which is seen as monopolistic, prescriptive, and obstructive to the supply and demand of a free market system. This is in sync

with the New World Order (NWO), with its agenda of global de-population/impoverishment and controlling resources and markets… starting with Africa as the guinea pig!

America, UK and European countries have been reported in mainstream media to be dumping milk, onions, eggs, beans, cabbage, tomatoes, etc. China, India, United States, are followed by the other leading countries, such as Russia, UK, Europe, etc and are said to be dumping half their produce; Africa about a third! The waste ends up in landfills. Japan and Switzerland are the least wasteful.
Similarly, our agricultural supply here is controlled by a handful of white farmers; the majority of consumers are blacks mainly and other non-farming communities.

Have a look at these, the major producers in the country;

- the largest citrus producer in Limpopo is a third-generation family
- The largest integrated poultry producer (broilers, layers, fertilised eggs, feed, processed, etc) is Astral Foods. Rainbow Chickens was at one time the largest broiler operation.
- The VaalHarts Valley is probably the largest irrigation scheme in the Southern Hemisphere. Produce in the area includes olives, pecans, peanuts, citrus, wine, cotton, and various stone fruits. The first olive trees were planted in 1995 and at present, there are over 200,000 trees of over 60 varieties.

  The VaalHarts scheme is land confiscated from indigenous Chief Ghaleshewe circa 1897. ***Kgosi (Chief) Galeshewe****, (c. 1835 - 1924), was a chief of the Batlhaping group in South Africa. He was an anti-colonial revolutionary and orchestrated rebellions against the Cape Colony government. The Galeshewe Township in the Sol Plaatje Municipality, Kimberley, has been named after him – (who was Chief Ghaleshewe in cape - Search (bing.com)).*
- **Pomona** is the largest pomegranate producer in South Africa and in the southern hemisphere.
- ZZ2, is a private farming operation based in the Limpopo Province in South Africa. As the largest tomato producer in the Southern hemisphere, ZZ2 exports produce all over the world. ZZ2 also grows onions, apples and pears in the Western Cape. Dates are cultivated in southern Namibia. ZZ2's workforce of approximately 10 000 people is where production, packhouses and marketing teams work closely with specialists, such as agronomists, engineers, and artisans. - ZZ2 Farming - Esri South Africa-Esri South Africa, https://www.esri-southafrica.com/zz2-farming
- Recognised as the Avocado Experts, Westfalia Fruit is a multinational (rather multi-colonial?) organisation with the largest avocado-growing footprint in the world. They not only grow their own fruit but also source, ripen, pack, process, and market quality avocados year-round - The Avocado Experts Westfalia Fruit: https://www.westfaliafruit.com

It is the same situation within all other sectors; total control of production, a virtual, autocratic monopoly when it comes to supply and pricing. Even the pesticides, seeds (GMOs?), chemical fertilisers, vaccines, etc.

We are about the only country in Africa where the bulk of fertile land belongs to a handful that controls almost every aspect of commercial farming on such a monumental scale. In America, Bill Gates is said to be the largest land owner…and, he is in touch with our top brass corporates, politicians, medical fraternity, farmers, etc!

In the face of farm murders, we were at one time threatened with farmers holding back supplies and/or destroying them; farmers threatened to punish consumers for the alleged failings of the government/police. Yet, most of these same farmers have no compunction in using banned pesticides, GMO's, chemical fertilizers, medication administered to poultry and livestock, anti-biotics, etc, that can affect human, animal, vegetation and soil health!

Collectively, we, the consumers are also paying suspected grossly inflated prices for farm produce. A lettuce that you plant in your backyard should cost no more than R3.00 (seed, compost, and water). Yet, currently, a lettuce head is R20.00 out there!
Besides, the majority of our population has been locked in as consumers who have no or very little idea of farming, or growing fruit and vegetables.

We generally have no indication what are GMO's (Genetically Modified Organisms), the effects of chemical pesticides (such as RoundUp), the composition/source of commercial fertilisers; what else besides brine injected into chickens, the medicated feed and antibiotics administered to poultry and livestock before slaughter, etc. (I intentionally repeat this mantra!)
Credit to some farmers that are reported to be objecting to GMO, pesticides, etc.

Every household can do its little bit; prepare compost and grow nutrition-loaded, organic vegetables in backyard cabbage patches!

- **All religions and Scriptures (Hindu, Christian, Islamic, Judaism, Zoroastrian, African Traditional, etc) call on adherents to eat and drink what is wholesome, nutritious and clean.**

NB:
STOP PRESS!

- **The African Centre for Biodiversity litigation against the marketing of drought-tolerant corn genetically modified (GMO), has been successful in the SCA (Supreme Court of Appeal). Relates to its approval by Monsanto, now Bayer whose application for approval has been annulled.**
- **Certain chemical poesticvides hae also been banned by Government.**

Not only is the public being exploited, but also guinea pigs for SLOW GENOCIDE!

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HAJI HANIF MANJOO

CHAPTER 2

HORTI OR AGRICULTURE?

Differences Between Horticulture and Agriculture

What is the difference between horticulture and agriculture? The main difference between horticulture and agriculture is the scale of production.

What is Agriculture?

Agriculture involves the large-scale cultivation of plants and animals, usually for food. Here, GMO's, pesticide, medications, are front row! Agriculture includes traditional farming and raising livestock. Common crops and animal products produced in the U.S. include corn, soy, beef, and cotton. This is commercial and large scale; our fruit and vegetables are primarily supplied by them… whether the supermarkets, local fruit and veggie, farm stall, weekend or bulk market!

Benefits Of Agriculture

Human civilization would not exist without agriculture. The main benefit of agriculture is that it feeds our society with a basic, life-sustaining essentiality – ***food***. It also provides many jobs, ingredients for medicines, spices, and other raw materials such as wool and leather to the secondary industries.

What is Horticulture?

Horticulture is the study of the cultivation of crops and plants for human consumption or aesthetic purposes such as gardening. Horticulture usually happens on a small scale like a greenhouse, formal flower bed, backyard veggie patch, pot plant, grow-bags, etc. It deals with the cultivation of all types of flora, from trees and shrubs to flowers and vegetables. Horticulturists study plants and use technology to improve their quality and quantity.

Horticulture focuses on small-scale crop production, and ***agriculture*** focuses on large-scale production, which means higher outputs. Agriculture tends to be monoculture, while horticulture tends to be polyculture. Why is horticulture important to agriculture? Horticulture specializes in improving plant quality and yield which can be used to make agricultural practices more effective and sustainable. This includes making plants more nutritious and resistant to disease; biological or organic farming.

Sub-disciplines of horticulture include:

- the production of vegetables
- the production of fruit
- the production of flowering plants

Landscape horticulture – involves designing, constructing, and maintaining landscapes – (Unity Environmental University- New Gloucester, USA)

AgroEcology the Alternative?

Should all GMO's be banned?

Research who are the major distributors of GMOs in our country.

The alternative is agroecology, organic self-sustenance. While the emphasis with GMO's is on increasing productivity and protecting against insects and diseases, with agroecology it is organic and conservative. The advantage is that organics contain far more nutrients and are healthier.

What then is Farming?

Farming is what the farmer does; plants crops, sees to livestock, cultivates the land, shears the sheep, milks the cows, etc.

For our purposes, agriculture and/or farming we will regard as inter-changeable, if not similar.

This is also the basis for our organic self-sustenance vegetable growing in food gardens, backyards, schools, townships, etc.

Confusion confounded? Eish!

CHAPTER 3

1. WHAT, WHEN, HOW & WHERE TO PLANT

Vegetables are normally divided into four segments on their characteristics, presentation and requirements:

- Cabbage Family; Cauliflower, turnips, kale, etc.
- The Squash or Gourd Family; butternut, pumpkin, hubbard
- Legume or Pea Family; peanuts, beans, peas
- Nightshade Family; potatoes, tomatoes, eggplant, etc

Top 10 Easiest Vegetables to Grow

Lettuce	Green beans
Radishes	Tomatoes
Zucchini	Peppers
Beets	Carrots
Chard, Spinach, or Kale	Peas

Add flowers, such as marigolds, nasturtium, zinnia, dahlia, etc., which discourage pests, attract pollinators, and add some color!

The fresh produce that we consume; what do we know about them?
Let's follow the trail, the basics, procedures, and the different aspects of setting up your own veggie patch, etc.

a. What to plant

Fruits, vegetables, and herbs require not only special climatic conditions and the right season, but also soil, water, nutrients, etc, not forgetting a healthy dose of TLC!

Did you say Fruit Trees?
Well, we get different types of fruit.
: berries, pits, cores, citrus fruits, melons and tropical fruit. 01 Sept 2017.
https://www.linkedin.com/pulse/what-six-fruit-groups-walter-potenza/
This gets more confusing with numerous categories!

Fruit saplings or seedlings can be purchased from nurseries or grown from seed. It is advisable to purchase saplings. Find out if they will adapt, take a sample of your garden soil to test, and ask all questions relating to transplanting, watering, winter cover, frost resistant or full sun, etc.

With most popular fruit, the wait to pluck your first harvest can be between 3-7 years before the trees bear fruit. In some cases, they don't even bear after years! Common reasons are tied to climatic condition, inappropriate soil, absence of necessary nutrients or wrong fertliser, lack of or over watering that can clog the roots, even male and female plants that do not get to meet, etc!
The fruit is usually harvested once a year in summer. That translates to saving on labour (besides often the headache that goes with!) and wage bills, monthly/weekly.

However, if the fruit, tree/orchard is attacked/infested/contaminated; boom goes everything… hailstones aside!
Fruit farmers also depend on casual labour for 'picking' at harvest. If these pickers are not available, or flooding of fields, a potential disaster and loss of income are on the horizon! The fruit either rot, fall off if over-ripe, or are eaten by birds and insects.
Compare against planting vegetables that are harvested within a week or two (sprouts and micro-greens) after planting the seed.
Fruit trees would be a proposition if you have a large farm (go commercial!), or if they are scattered as companions for shade. Most trees require pruning and spraying, against insect pests usually before spring.

You also have to consider where to plant.

- Not too close to buildings as the roots can end up problematic in time by creeping under the foundation of the house.
- Not alongside a fence as well. Your neighbour will likely complain in winter (falling leaves are messing up his/her yard), or pick the fruit in summer before you get at them… if they hanging over into his/her yard, they can claim theirs!
- Trees can also be a fire danger if lightning strikes and they catch alight!

Vegetables (and herbs): Your main sources of info will be the seed packet (usually at the back), or the websites of seed distributors (Living Seeds, Seeds for Africa, etc), local nurseries, agriculture groups, or… Google! In our ***References*** appended at the end, we list numerous leads and sites; you can explore even more.

Different veggies have different characteristics (like humans!) that you need to know. For example, tomatoes;…

- Determinate variety, which reaches a certain height at maturity, drops fruit once, and then dies off.
- Indeterminate are climbing plants that can reach from 60cm to well over 2 metres! They produce fruit throughout the growing season.

Both varieties are re-planted annually.

b. When to plant

Some vegetables grow best when the seeds are directly sown into the soil/bed outdoors, while others indoors, preferably under grow lights. Seedlings are normally germinated indoors and then transplanted. The planting of different vegetables varies according to the season. Whether you should sow seeds outdoors or indoors depends on your growing season and the types of vegetables you plan to grow.

Planting seasons vary significantly with vegetable crops. So, check your seed packets (Google!) for the specific planting instructions and timing.
On large farms, some plant soya (not dry beans or canola!) early and then maize. They claim that is beneficial before planting maize crops.
Maize and sunflower alongside, spaced, is also a common practice; peas and beans to replace the nitrogen in the soil.

c. How to plant

As mentioned above, some seeds can be planted directly into soil/substrate, while others must be nurtured in potting soil in seedling trays before transplant; usually once they reach about 10-20cm in height.
Always exercise extreme care in lifting the young plants out of the seedling bed/base; lift the soil around with it. Try not to cut off or damage the roots.
When doing so, prepare the hole for transplanting in the ground/pot, dig wide and deep enough so that the seedling sits comfortably inside. Space the seedlings out as suggested if on the ground. Should they be planted too close, the plants will compete for light, water, nutrients and root space to expand in the soil.
After transplanting, dig a circle around the seedling about 5cm deep. Sprinkle some potting soil mixed with compost and cover with soil if you planting in the ground/raised beds; this will provide much-needed nutrients to the seedlings.
Water… spray to wet, or else the seedling will drown with excess!
For the first week or two, water lightly on alternate days; don't overwater! Thereafter, once or twice a week. Monitor soil does not get too dry or soggy.

d. Where to plant

This is just as important. If the instructions say sun, then in open ground. In other cases, part sun or shade. Ensure it's the right season, the soil is suitable for the plant and that water is available.

If you have tunnels, then adapt accordingly; drip irrigation, grow lights, fans, heaters, shade netting to allow sun rays in, etc.

Planting in Pots

With pots and hanging gardens, equal amounts of soil, compost, and potting soil in the containers. Not necessarily same mix for such as succulents, cactus, fruit trees, etc. Check with nursery.
In using pots…

- for short roots (Coriander/Dhania, Lettuce, Chives, Onions, etc), the pot/container (round or rectangular) depth should be about 10-20cm deep.
- For deep (tap) roots (carrots, spinach, pumpkins, squash, tomatoes, potatoes, okra, etc), must be at least 20cms to 40cms deep.

Plastic/canvas/hessian animal feed bags (50kg) can be cheaper than pots. The heavy-micron, thick supermarket bags can also be used for shorter root plants like spinach, radish, etc. Always, punch a few tiny holes at the sides or bottom for excess water to run out and for the soil to breathe.

2. TRANSPLANTING

The seedlings are ready to be planted out when they have at least four leaves or the stalk is as thick as a pencil. Transplanting means moving the seedling and surrounding soil to the grow box, container or on ground/raised bed.

Some tips for transplanting seedlings:

A. Choose the sturdiest, healthiest, tallest plants.
B. Plant out in the afternoon or on a cloudy day to ensure that the seedlings are not damaged by strong sunlight.
C. The day before planting out, water the grow boxes, plant pots, or ground surface thoroughly, to create the best possible environment for the seedlings.
D. Remove the seedlings with the little soil, using a trowel, spoon or scoop to pick up.
E. With a hand spade or trowel make 10cm deep holes in the soil of the grow box or pot and leave that right amount of space between each seedling if planting on the ground or raised bed.
F. The plant roots should point downwards and be separated. Cover with soil and press down lightly to remove any pockets of air. Make sure that you bury plants deeply.
G. After transplanting the seedlings, water gently, making sure that the roots remain covered.

Here is a list of what you will require to kick off gardening. Not all are necessary; you will learn as you go!.

Seedling trays, or small containers

There are various media/substrate for seedlings, such as coir, potting soil, grow/heating mats, compost, etc. Your nursery/garden shop will advise you on each. However, it's best to keep to tried and simple until you are au fait with them all; stick to potting soil or organic compost mixed with garden soil…about 30/90 (1 compost to 3 loose soil).

For seedling trays, improvise if a cash crunch; such as egg containers, plastic water/cool drink, milk bottles (2litre n 5litre), tomato boxes, cardboard juice containers, toilet roll 'cones', etc.

Not all seeds will germinate; planting two to three seeds per seedling hole increases your chances of getting at least one healthy seedling. Seedlings planted too closely together compete for nutrients, light, and water and end up stunted; they also bully each other!
Some seeds (with outer kernels and herbs like coriander) can be soaked overnight or two before planting to soften the kernel and accelerate germination.

Your on-hand kit

* Twine, rope, thin (fencing) wire and wooden/bamboo stakes with pig/chicken netting to make trellises or cages, gum poles/metal/concrete standards can be on hand.
* Shade/frost netting to protect against sun or frost in winter.

* Neem oil, Bicarbonate of soda, Epsom salts, Dish washing liquid, cinnamon, cayenne pepper, etc. Spray bottles; to spray and control insects and pests.
* Cash Book to record all expenses/costs, purchases and sales.
With that, Record Sheet for the different veggies; when planted, mass/quantity on harvest, any pesticides, comments, etc. Or, record on your computer and keep track.

Treat your gardening as a business, even if as a hobby, and sell to yourself…at least you will not only be aware of cost input and output, but can advise others on how to go about costs and returns on investment!

Seedling tray. In removing the seedlings for transplanting, watch how this is lifted with the medium and roots. The size and depth of where you are transplanting must be larger. The substrate can be potting soil, mixed with compost/garden soil, coir, peat, etc for most seeds. Keep in mind, some seeds can be planted directly, especially the larger ones.

3. TOOLS, EQUIPMENT & ACCESSORIES

These are common tools that you should find in a garden:

VEGETABLE PLANTING RECORD SHEET

Keep a record/diary of what and when you plant using a Record Sheet; spread-sheet on your PC if you can.

DATE	DESCRIPTION	GERMINATE	SPACING	SEASON	HARVEST	YIELD	COMMENTS
Jan 28	Ideal red carrot	10-14 days, direct	1x5x15cm	Spring/summer	90-110 days, Apr, may		Stark ayres, full sun
Jan 29	Okra Clemson	Direct 10-14 days	1x30x90cm	All year, frost free	55 March		frost free
	Egg plant, blk beauty	10-14 transplant	1x50x100cm	All, frost free	75		
	Cauliflower Snowball	14-21	4x40x50	Summer, Autumn	120-140		Full sun
	Carrot Chantenay Karoo	10-14 direct	5x5x30cm	Spring, summer	70		Full sun, frost free
	Petunia	10-12 direct	1x20x20	All year	90-120		
	Carnation Chabaud Giant	100-120 direct	1mmx20x20	All year	100-120		
	Cactus	14-21 transplant	5mmx20x20	Spring, summer			Sandy soil with percolate

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CHAPTER 4

OUR SURVIVAL PACK

The essential components in gardening are ***seed, soil, water, fertiliser…and light!***

SEEDS

If you have all of these in the correct dosage, never cry the beloved garden; let the sun shine bright thereafter! No seeds, no garden, no bees….no food!
Most plants are propagated via seeds and roots, some even from their stem or leaves (succulents, aloe vera, etc) and others by grafting.

Let's take a stroll…

The information on a seed packet often is simple and self-explanatory. But, to the fresh recruit, it can be confusing. First, what is the best choice; vegetables, herbs or flowers? Whether you want to start seeds indoors or directly into the garden, it's important to pick the right seed variety to achieve the best results. Google and read up….

Assess the different types of seeds and terms used in seed catalogues to learn what they are and the application for each type. With time, you will identify the seeds from their shapes and sizes, and the plants from their leaves and flowers…don't rush; start with one or two varieties. The symbol images at the back of the packet indicate sun, shade, spacing, seedling or direct planting, depth of soil (usually 1cm or 2cms), type of soil, watering, etc.

a. Heirloom Seeds

Heirloom seeds are what have been passed down from one generation to another to produce a particular/older cultivar, similar to parent. They are open-pollinated (by birds, bees, wind, etc) and their ***seeds may be saved for the next planting season***. These seeds retain and transfer their superior flavour, appearance, or performance.
Most specialists recommend heirlooms as they perform better, are hardier and the fruit even tastier!
Some seeds are associated with a particular geographic region where the local soil and suitable climate are necessary; for example, the cactus and aloe in desert areas, such as the Kalahari in South Africa.

Examples of Heirloom Seeds:

- Black Krim Tomato: This usually black fruit has a rich and tangy flavour and is considered one of the most nutritious tomatoes.
- Kentucky Wonder Bush Green Beans: Also known as 'Commodore, the pods are up to 9 inches long, and are said to be among the tastiest of all green beans.
- Chinese Long Beans: One of the heirloom pole beans, Chinese long beans can reach 10 feet high with pairs of pods 14 to 30 inches long.
- Black Velvet Nasturtiums: Growing only 10 to 12 inches tall, the velvety-black blooms of this nasturtium make it a showpiece.
- Fizzy White Cosmos: The large pure-white blooms have tufted centers and overlapping petals with fine pleats and zigzag edges on this easy-to-grow cosmos.

b. Open-Pollinated Seeds

Generally speaking, the term refers to **plants pollinated naturally by birds, insects, wind, or human** hands.

- Open-pollinated seeds are the best choice for those interested in seed saving because the plants have stable traits that pass from one generation to the next.
- Open-pollinated heirloom seeds produce plants that are similar to each other but not as uniform as hybrids. Open-pollination creates a more genetically diverse gene pool which allows plants to slowly adapt to local growing conditions.
- While all heirloom seeds are open-pollinated seeds, not all open-pollinated plants are heirlooms. See: hybrid seeds.

c. Hybrid Seeds

The majority of flower and vegetable seeds available to the home grower are hybrids. This is not the same as genetically modified seeds. Hybridization can occur naturally through random crosses.
A hybrid forms when open pollination occurs between two varieties of plants. Such controlled cross-pollination produces hybrid seeds with desired traits, such as disease resistance, uniformity, and greater vigor. Vegetable plants grown from hybrid seed are often high-yielders, but they are ***not reliable for seed saving***. The seed will be genetically unstable and may not produce any fruit or flowers at all; note my comment about fruit trees that don't bear. Unlike heirlooms, the seeds saved from hybrids will not grow true to type in the next generation and will be less vigorous and more genetically variable.

***A few hybrid seed varieties*:**

- **Silver Queen Corn**: The Silver Queen hybrid was developed for productivity, flavor, and wide climate adaptability.
- **Riverside Spinach**: This spinach hybrid resists heat-induced bolting, is mildew-resistant, and bears small dark green leaves.
- **Prizm Kale**: This hybrid seed produces densely packed plants with short, tightly ruffled, deep green leaves with nearly stemless stalks.
- **Oktoberfest Calendula:** The Oktoberfest calendula provides a steady stream of deep orange flowers throughout the summer and fall.
- **Carmine Velour, Petunia Wave**: Hybrid petunias like the Carmine Velour Wave produce seemingly endless blooms that never fade.

d. Organic Seeds

Organic seeds are those collected from plants grown without the use of non-organic pesticides. Organic growers that sell produce or flowers are required to source organically produced seed and are restricted from using GMO seed.

e. GMO (Genetically Modified Organism) Seeds

Genetically modified seeds (GMOs) are developed to change a trait in a plant to a more desirable trait like pest or herbicide resistance. Seeds packaged for home garden use are not and cannot be genetically modified. Seeds are only available for nine commercially-grown crops, corn (field and sweet corn), soybeans, canola, papaya, cotton, alfalfa, sugar beets, squash, and rice.
Except for Russia, wheat in all other countries is GMO.

In Ethiopia, for hundreds of years, there were about 100+ different types of heirloom wheat seeds. However, with technology and recommendations, they reduced them to about 6 most popular cultivar types!
Where it was previously an exporter, now its production has dropped due to climatic changes and other variables, such as technology, land, economics, politics, transport infra-structure, etc. As a result, Ethiopia imports most of its wheat, bulk of it from the United States.

Where is genetically modified wheat grown?

HB4 (genetically modified with sunflower genes for resistance, etc!) has been approved for import by Argentina, Brazil, Colombia, Australia, New Zealand and Nigeria for use in food and feed. But only two countries, Argentina and Brazil, are authorized for production of GM wheat.17 Mar 2023…Google.

Countries growing GMO crops: Argentina, Australia, Bangladesh, Bolivia, Brazil, Canada, Chile, China, Colombia, Costa Rica, Czech Republic, Honduras, India (Bt cotton only), Malawi, Mexico, Myanmar, Nigeria, Pakistan, Paraguay, Philippines, Portugal, South Africa, Slovakia, Spain, Sudan, eSwatini (Swaziland). https://geneticliteracyproject.org/gmo-faq/where-are-gmo-crops-and-animals-approved-and-banned/#
In Europe and most Asian and East European countries, GMO's and pesticides are banned!

Which Seed Type Is Best for You?

Just as every gardener and garden is different, the best seed type for you depends on your wishes. **Hybrid seeds** usually produce stronger plants with desirable qualities. However, you cannot save the seed; you will need to purchase new seeds every year. **Heirloom seeds** continue the genetic diversity of historic flowers and

vegetables. And, by choosing **open-pollinated heirloom varieties**, you can save the seed and share it with others knowing what type of plant the seed will produce.

With Vertical AgroEcology…
* the synergy would be the hanging garden in containers which can produce 3-10 times more produce than planting on the ground or raised bed; far less ground space.
* Under shade netting, enclosed environment, tunnel with plastic sheeting/curtains on sides to curtail heat loss or not,
* instead of processed, expensive liquid fertilisers (which are admitted to lack all the nutrients), minimal soil and organic compost mix as was done for millennia by our ancestors
* water consumption is far less than on the ground
* insect and pest invasion will be neutralized,
* standard of crop high, consistent, and free of pesticides,
* Labour is saved on time-consuming weeding and harvesting as no back bending on large tracts of fields,
* Gondolas/bins on wheels to transport picked harvest in bulk
* mobile conveyor traction units for transporting the harvest to the end of each row/passage, like how eggs are collected in a mechanized chicken layer house.

CHAPTER 5

SOIL

Should your garden look desolate and lifeless; no birds, bees, butterflies or even insects…the culprit might be your soil!
It is important that you know the different types of soil and know what plants will thrive in which type of soil, whether mixed or require additives.

The simplest test on the health of your soil is;
Dig with a hoe or fork about 20cm or more into the soil. If you unearth such as insects, earthworms and the soil is slightly damp, loose/porous with strands of roots or grass, it's doing well. Also smell the soil (it must have that 'earthly' smell!), colour reddish brown to grey/black with compost, texture (crumbles easily and does not bind as with clay), and top soil looks good. If soil is hard (lumpy when squeezed in palm) or too loose, add between a third to 50% organic compost; mix into soil about 10-15cm deep. As you water, the nutrients will filter down to the roots as well.

There are 6 different types of soil; each has its characteristics and applications.
Soils are identified by their Texture, Compaction, Water Retention and the size of particles/grains. You will most likely come across sandy, loamy and clay soil.

They are as follows (with suggested plants that suit each type):

1. Clay soil

   Bee balm, Canna lily, Ferns, Hibiscus, Roses, Coneflower, Daylily, Anemone, etc (Google)

2. Sandy Soil

   Butterfly Bush, Palms, Salvia, Succulents, Yucca, Lavender, Allium, Cosmos, Rosemary, Geranium, Potatoes, Carrots, Zucchini, etc (Google for more)

3. Silty Soil

   Butterfly bush, Daffodil, Hardy geraniums, Hosta, Roses, Potatoes, Cucumber, Artemesia, Carrots, Daylilies, etc

4. Loamy Soil

   American Beautyberry, Hydrangea, Larkspur, Wisteria, Bee Balm, Lavender, Carrots, Cucumber, Sedum, Hosta, Daylily, etc.

5. Chalky Soil

   Bellflower, Ceanothus, Clematis, Dianthus, Lavender, Berberis, Agapanthus, Aster, Paeonia, Yew, Trees, etc

6. Peat Soil

   Azalea, Blueberries, Caladium, Camellia, Magnolia, Rhododendron, Potatoes, Beet, Celery, Spring Onions, Carrots, Lettuce, Spinach, etc.

The above soil types may be mixed, but you need not bother unless studying for a doctorate in agriculture or a tender to test the soil on the moon! Stick to sandy soil and mix with compost!

Besides soil types, soil pH tells you whether your soil is acidic, alkaline, or neutral. The pH scale goes from 0 to 14 with pH 7 as the neutral point (don't let that intimidate you!).
There are different ways of testing soil, the most popular being penetrometer to test compaction and soil penetration.
Neutral soils are the norm.

These are the **3 types of soil** we told: ***Acidic, Alkaline, Neutral.***

You can also home test your soil for peace of mind:

- **Acidic soils** are commonly found in areas that experience frequent rainfall.
- **Test:** add half cup/3 tablespoonss of bicarb/baking soda to about a handful of soil in a container and mix with water (preferably boiled in micro-wave, distilled or filtered borehole). If fizzing/bubbles, soil is acid.
- **Alkaline soils** are usually found in dry regions or areas where there isn't much rainfall throughout the year.
- **Test:** take a handful of soil, and place in a container. Pour half a cup of white vinegar and mix into the soil. If the soil bubbles, then it's PH alkaline.
- **Neutral soils** are usually ideal for growing plants because most nutrients are absorbed into the soil. If no bubbling/reaction, then the soil is neutral.

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CHAPTER 6

1. FERTILISERS AND COMPOSTING

Fertilizers are to plants what food and water are to humans and animals.
'Plants grow using energy from the sun combined with nutrients taken from the soil. Because the organic matter in soil holds nutrients like a sponge until they are needed by plants, soil that is fertile, well-drained, and regularly enriched with compost, often holds a reasonable supply of plant nutrients' – Miracle-Gro®

There are three types of plants that require appropriate feeders/fertilisers and/or mulch and drainage; heavy (tomatoes, cabbage, onions, cauliflower, peppers, etc), moderate (okra, potatoes, sweet potatoes, etc) and light (turnips, beans, peas, etc)
Plants need nutrients which they derive from the soil, or liquid sub-strate as in hydroponics.

N-P-K?
There are **three types** of nutrients plants require in varying amounts:
Primary Nutrients; Nitrogen, phosphorus and potassium.
Also ***Secondary nutrients***: Magnesium, calcium and sulphur.
Your fertiliser will usually have the following numbers: 5-10-10. This means it has 5 percent **N**itrogen, 10 percent **P**hosphorus (phosphate), and 10 percent potassium, **K** (potash) which would normally be Greek! **N-P-K** represents the percentage of each element in the formula.

Organic or Chemical Fertiliser?
"Organic means it's derived from animal or plant-based sources, such as manure or compost," says Glen Harris, PhD, professor and extension agronomist at the Department of Crop and Soil Sciences at the University of Georgia.

Organic fertilizers typically include animal manure, alfalfa and bone meal, and fish emulsion. Our ancestors used them for hundreds, if not thousands, of years!
As for bone meal, it can be derived from bovine (cows), pigs, sheep/goats. Pig and cow sourced can affect humans via absorption by the plant. See Bone and Fish Meal below.

Organic is distinctly different from **synthetic** commercial fertilizers that primarily include a concentrated formula of nitrogen, phosphorus, and potassium. Synthetic fertilisers release powerful nitrogen oxide if containing ammonium or urea. This in turn not only contaminates surrounding land/farms (rain or flood water borne), but also releases greenhouse gas that promotes climate changes! Besides, the excess nitrogen flowing into streams and rivers impact negatively on our ecosystem. Livestock that drink from such contamination can suffer various ailments. That infection may also migrate to humans (like Mad Cow Disease). The various inhabitants (fish, frogs, insects, etc) and plants can also be infected or die.

Plants absorb nutrients in certain forms, and organic fertilizer formulas must first be broken down by soil microbes through a process called mineralization.

"One of the challenges with organic fertilizers is that the nitrogen is often around 3 or 4 percent," says Clint Waltz, PhD, a turfgrass specialist at the University of Georgia's Turfgrass Research and Education Center. "It takes a lot more of these products to get the results you want, especially on lawns. When you calculate cost, synthetics are less expensive and you don't have to apply as much." Peas, beans, cabbage, cucumbers, etc as companion plants can supplement nitrogen supply?

What does organic fertilizer contain?
Commonly used organic fertilizers include composted animal manure, compost, sewage sludge, food processing wastes, and municipal biosolids.
They improve soil health and release nutrients to soils gradually. Organic Fertilizer - an overview |ScienceDirect.com https://www.sciencedirect.com › topics › organic-fertilizer
If our ancestors survived with organic, so be it!

What are the 5 benefits of using organic fertilizer?

1. Balances the soil ecosystem.
2. Boosts plant health naturally.
3. They're all-natural.
4. The process of decomposition requires no chemical intervention.
5. Organic fertilizers don't upset the balance in the soil because they don't leave behind any artificial compounds (Google)

Disadvantages of Organic fertiliser

1. *Not All Products Are Created Equally*
Not all products are created equally and many organic products produce inconsistent results. Make sure you are selecting a product that is industry vetted by reviewing any university studies or case studies.

2. *Nutrient Levels Are Low*
The level of nutrients present in organic fertilizer is often low. In addition, the nutrients are usually complex in organic chemical structure; this means using organic fertilizer may not produce the pop of color seen with a chemical fertilizer. * It's usually Nitrogen that requires replenishing; plant beans, peas, cucumber, cabbage, etc.

3. *DIY Compost is a heavy Procedure*
While you can produce your own compost, it can be a messy process! You must also have a stomach for worms, insects and stinks!

Organic fertilizer has been used for thousands of years!

2. BONE AND FISH MEAL

What does bone meal do?

Is bone meal a pork or bovine extract (halaal aside!)?
Bone meal can come from pigs, bovine (cows), sheep, goats and even chicken.
Bone meal supplies calcium and phosphorus to the soil. Most soils have these in ample amounts. An excess of phosphorus can affect the roots. However, there are organic substitutes to replace.
Most agri-advisers suggest; skip bone meal!

Research results into cow, pig and fish meal are conerning, especially where the source has been infected/ contaminated; see reports below.

Fish meal can be from rivers and sea polluted with chemicals, sewerage waste, metals such as mercury, lead, cadmium and uranium, gases, etc. That probably explains why poultry feed manufacturers have switched to soya; besides that fish taste in chicken meat!

Here are the reports, judge for yourself:

- **Fish Meal**: our health problems can result from **many different types of contaminants;** they are largely derived from pollution contaminating water supplies and the food chain in the ocean. For instance, chemicals like lead and pesticides can contaminate the water and may lead to such health issues as hormonal problems and kidney damage. Pollution that's found on the beach may lead to illnesses and serious side effects when you come into contact with the pollution or ingest the water. These side effects include everything from diarrhea to stomach aches.
  Likely the most serious problem with ocean pollution is that bacteria that exists in the ocean water turns certain metals, like mercury, into highly toxic forms of the metal. These toxic metals are then absorbed by the tiny plankton in the water before progressing through the food chain. Eventually, the toxic metals and the fish that consumed them will be on your plate when you eat seafood. Exposure to mercury is known to cause such health problems as Alzheimer's and Parkinson's disease. Nearly 33 percent of all waters around the U.S. that contain shellfish are affected by coastal pollution - https://sensorex.com/ocean-pollution-affect-humans

- **Bone Meal** - Health Encyclopedia - University of Rochester Medical …
  Bone meal and other animal byproducts that have been used as animal feed or supplements have been shown to **transmit BSE.** The type of processing determines if the infectious agent is there. Bone meal is produced by boiling the bones, allow to dry and crush into powder.

This means that if the bone meal is not 'cooked' thoroughly, there is a likelihood of transmission from plants to humans if infected source.
University of Rochester Medical Center https://www.urmc.rochester.edu/encyclopedia/...

Biomagnification by feeding animals toxic GMOs! Feeding these throughout their life means that the trace toxins from pesticides and herbicides found in them reside in fatty tissue and even absorbed into the bones. "Biomagnification or biological magnification is the process of accumulation of certain chemicals in living organisms to a concentration higher than that occurring in the inorganic, non-living environment."

Impact on Human Health: Biomagnification makes humans more prone to cancer, kidney problems, liver failure, birth defects, respiratory disorders, and heart diseases - https://byjus.com/biology/biomagnification/

Drawbacks of Using Bone Meal Fertilizer:

- **Not Universally Suitable**: Bone meal isn't a one-size-fits-all solution. Evaluate factors like soil composition and gardening needs.
- **Not Vegan-Friendly**: It's not suitable for vegan gardeners.

In summary, bone meal fertilizer can benefit plants, but it's essential to consider individual circumstances and gardening practices when using it. As for humans, consuming pork directly has its own considerations, unrelated to bone meal. (The Spruce)
Bone meal extracted from cows can also be harmful if sourced from Mad Cow Disease affected herds.

3. HOW TO COMPOST: A BEGINNER'S GUIDE TO COMPOSTING ORGANIC WASTE

by David C. Smith

Composting is the process of converting organic waste, like food scraps and yard debris, into a nutrient-rich fertilizer for your garden. Learning how to compost is easy, and it's one of the best things you can do for your plants and the environment. In this beginner's guide, you'll learn all the composting basics to get started recycling your organic waste into "black gold" for your garden.
There are quite a few different methods you can use to compost at home. The basic types include:

a. Compost Bin or Pile

This involves placing compost materials in an open pile or bin. You'll turn and mix the pile periodically to aerate it as the materials break down. Using a bin helps keep the pile neat and retains heat and moisture. Bins can be bought from your local garden center, or you can build your own from materials like wood, wire mesh, and plastic.
Begin by creating a 4-5 foot wide base of brush or wood chips to allow air circulation under the pile. Add composting materials on top, keeping the pile moist. Turn and mix the pile with a pitchfork every 7 to 10 days. In 2 to 3 months, you should have usable compost.

b. Tumbler Composter

Tumbler composters are closed drums that sit elevated on a stand. You load compost materials through an opening, then turn or "tumble" the drum periodically. The tumbling aerates the compost. Since they are enclosed, tumblers retain heat and moisture well.
Compost can process faster, in as little as 2 to 4 weeks in some cases. Tumblers can be rotated easily to mix contents. However, capacity is more limited compared to open bins and piles.

c. Vermicomposting

Vermicomposting uses red wiggler worms to break down organic matter. You house worms in bins with bedding and feed them food scraps. The worms produce castings, which are full of nutrients.
Maintaining the right moisture and food supply for the worms produces compost in 2 to 3 months. Worm bins can work well for kitchen scraps in apartments or homes with limited space. However, you need to maintain proper conditions in worm bins to keep the worms healthy.

A Worm Farm Guide For South Africa

POSTED ON 14 NOV 2023 BY PLANTINFO

An informative site on lots of aspects: https://plantinfo.co.za/

What is a Worm Farm?

Embracing Nature's Recyclers in Your Garden

A worm farm, or an earthworm farm, is a compact ecosystem where red wiggler worms transform organic waste into a treasure trove of nutrients. Think of it as nature's way of recycling, turning your kitchen scraps into black gold for your garden! Worm farms are more than just compost bins; they are a testament to the wonders of nature's recycling abilities. Not only do they produce excellent compost for your garden, but they also serve as a fascinating educational tool, showcasing the lifecycle and the environmental benefits of worms.

Best Worms for Your Farm

Meet the Superstars – Red Wiggler Worms

In the realm of worm composting, the red wiggler worms are the unsung heroes. Adaptable and efficient, these worms thrive in South African climates, making them the top choice for your worm farm kit. Red wigglers are known for their ability to consume and process large amounts of organic matter. Their vigorous appetite and rapid reproduction rate make them an ideal choice for effective composting, ensuring your worm farm is always active and productive.

Feeding Your Worm Farm

A Gourmet Diet for Your Red Wigglers

Master the art of feeding your worm farm! From fruit and vegetable scraps to coffee grounds, we'll guide you through the dos and don'ts to keep your red wigglers happy and productive. Proper feeding is key to maintaining a healthy worm farm. By understanding the dietary preferences of your red wigglers, you can ensure that they not only survive but thrive, providing you with richer and more nutritious compost for your garden.

Building Your Own Worm Farm

DIY Magic – Creating Your Earthworm Sanctuary

Ready to get your hands dirty? Building an earthworm farm is easier than you think! Follow our step-by-step guide to construct a thriving home for your worms, using simple materials and a sprinkle of creativity. Constructing your worm farm is a rewarding experience that allows for customization and creativity. Whether you choose to build it from scratch or modify existing structures, the key is to create a comfortable habitat for your worms that also suits your space and style.

Purchasing Worm Farms

Where to Find the Best Worm Farm Kits in South Africa

For those preferring a ready-to-go solution, we've got you covered. Discover the best places to purchase worm farm kits in South Africa, complete with red wiggler worms for sale. Finding the right worm farm kit is crucial for beginners. It's essential to choose kits that are easy to maintain and suitable for your specific gardening needs.

Where to Worm Farms and Red Wiggler Worms in South Africa?

- https://www.wizzardworms.co.za/shop/worms
- https://biocast-sa.co.za/product/red-wigglers/
- https://gardening.co.za/products/red-wigglers-eisenia-foetida-500

- https://www.gardeninggonewild.co.za/product/red-wiggler-composting-worms/

The Benefits of Having a Worm Farm

Why Worm Composting is a Game-Changer

Worm composting isn't just about creating rich soil; it's about embracing a sustainable lifestyle. Learn how having a worm farm can significantly reduce household waste and contribute positively to our environment. Aside from the environmental benefits, worm composting is a deeply satisfying activity. It connects you with the cycle of nature and gives a sense of accomplishment as you watch your kitchen scraps transform into valuable resources for your garden.

Reduce waste by having a worm farm.

The fact of the matter is that most of the waste we throw into rubbish bins end up in one of our strained landfill sites. A more sustainable and environmentally-friendly option would be to consider getting a WORM FARM. It is so easy to operate and inexpensive!

Worm farms are very beneficial for the environment in that the waste that would usually end up in a landfill site is broken down into compost for the garden. The worms are natural recyclers consuming the food as bacteria breaks it down. The worms continue the process in their gut which contains even more bacteria. The resulting casts contain all the nutrients for plant growth as well as plant growth hormones.

A worm farm will give you Worm Wee (Vermileachate) and Vermicompost both, excellent for pot plants and gardens.

Also, ease your conscience by actively doing something for the environment.

Garden & Kitchen waste deposited at Landfill Sites adds to Global Warming & Pollutes the Environment.

Garden & Kitchen waste deposited at landfill sites are an enormous source of pollution to the environment. The two main problems with this waste deposited in Landfills are leachate and greenhouse gases. The waste rots and decomposes and produces acidic chemicals which combine with liquids in the waste to form leachate (pollutes the water and soil) and harmful gases (CO2 and Methane), both of which are greenhouse gases and contribute to global warming.

d. Hot Composting

This fast method involves building a large pile, at least 3x3x3 feet. Mixing a proportion of carbon and nitrogen-rich materials generates heat to speed decomposition. Use a pitchfork to stir the pile daily to dissipate heat and redistribute materials.

e. Nitrogen-Rich Materials

Grass clippings, coffee grounds and paper filters, paper tea bags (no staples)

f. Carbon-Rich Materials

Plant stalks and twigs, shredded paper (non-glossy, uncoloured) and brown paper bags

The high temperatures kill pathogens and weed seeds. Hot compost can process completely in 4 to 6 weeks. However, frequent monitoring and turning is required.

g. Trench/Sheet Composting

For this method, you bury kitchen scraps or other compostables directly in your garden beds. Dig trenches 8 to 12 inches deep in garden beds and mix scraps with soil. Bury about 2 to 4 inches below the surface.

The materials will compost over 2 to 3 months, providing nutrients right where your plants can use them. You can also bury them under sheet layers of cardboard or newspaper before planting.

4. THINGS YOU MAY COMPOST

- Fruit and vegetable peels, skins, and scraps
- Coffee grounds and tea bags
- Eggshells
- Shredded newspaper
- Cardboard boxes and toilet paper tubes
- Paper towels and napkins
- Cotton and wool rags
- Dryer and vacuum cleaner lint

- Hair and fur
- Grass clippings
- Leaves, straw, and garden debris
- Wood chips, sawdust, and shavings
- Hay and alfalfa meal
- Branches, twigs, and small sticks broken into pieces

Basically, any organic materials like plant trimmings, certain paper products, and foods are suitable for composting. To speed decomposition, shred or chop large pieces, and moisten dry materials like paper or leaves when adding to your pile or bin.

5. THINGS YOU SHOULD NOT COMPOST

While most organic waste breaks down well, some items should be avoided:

- Meat, fish, bones, or dairy products, which can attract pests
- Grease, oil, or butter-containing foods
- Pet or human waste (faeces, litter, diapers)
- Invasive weeds or noxious plant clippings, as seeds may survive and spread
- Diseased plant materials
- Sawdust, leaves, grass, or yard waste from chemically treated lawns or gardens
- Charcoal ash, coal, or briquettes
- Non-biodegradable materials like plastic bags or synthetic fibers
- Tea Bags…YES tea bags; they take long to decompose about 60%-80%. Teabags are made using three different compositions of polylactic acid (PLA), which are derived from sources such as corn starch or sugar cane… they increase worm mortality rate by at least 15%! https://phys.org/news/2024-05-biodegradable-teabags-dont-readily-deteriorate.html

Anything containing animal products, chemicals, or synthetic materials cannot be broken down; dispose!

MULCHING

What is mulching?

Simply, it is covering the soil around the plant to protect it (during winter or very hot summer) and the soil. Applying **mulch** around plants helps minimize evaporation, controls weeds, keeps insects and pests away; it's like a bandage over an open wound.

Mulch can be leaves, twigs, plastic sheet, newspaper/cardboard, wood chips/shavings, etc. However, there are disadvantages to mulching, such as some pests can breed underneath or it blocks oxygen/nitrogen, etc.

Read up in detail here: What is Mulching & their Benefits in Agriculture - TIMES OF AGRICULTURE

Shavings, wooden chips, grass, leaves, small twigs, etc...spread around the plant

Plastic sheeting with a round slit to allow for watering and inspection

CHAPTER 7

WATERING

- Both over-watering (will drown the roots and cause them to rot) and under-watering (will dry out and kill the roots), will affect your harvest.

- A simple rule; don't splash water on the plant or leaves; let it be at base and not with force. In small gardens, a 20lt garden watering can, with spray nozzle, should do.

- If you using a hose pipe, reduce the pressure.

- If it's pot/containers, a spray bottle would be preferable or watering can.

Watering of plants entails different methods, times and amounts;

When to water
Early morning is most advisable. This allows the water to soak into soil without the hot sun to then steam cook the leaves…unless it's loadshedding and you want steamed spinach!
Some experts advise against evening/late afternoon as mildew forms overnight; that can attract insects and plant rot.

Watering daily is not on; the roots can start rotting or dry up as the water might not go down to them. Check the appearance of the soil; if it is dry, then water…if wet, leave alone!
Always add enough water to get to the roots, which can be 10-20cms into the ground.

Hose Pressure
Avoid high pressure on the hose; medium to slow and get close to the plants

Don't water at mid-day or late afternoon.
Watering at mid-day (unless overcast) the hot sun can cause evaporation which will 'cook/steam' the leaves, which will then wilt and die off.

If you water late afternoon, and the water is not absorbed by the soil, that can result in mildew and invite pests and insects.

Not the Plant or Leaves!
Avoid spraying water on plants/leaves; water the soil. Wet leaves invite pest and insects

Let it Soak
Wait until water soaks and there is surface water, then move onto next area
Once next area is soaked, go back to the previous and, if the water has soaked, give it another dunking!

On the ground or raised beds
Whether on the ground or on raised beds, a hose pipe where water is directed to the ground below the leaves of the plant…at the base. Avoid wetting the leaves!

Pots/Containers/Hanging Gardens
Should you be using pots/containers, the same rule applies; don't squirt water on the leaves!
Run enough to fill to top and let the water seep down
You will note the water dripping off at the base breathing holes; that's enough!

Test with one of those Chinese chop sticks
Dip into container soil and note if stick is wet at base; see note below.

If not, water a bit more. If the soil is wet or damp, stop; don't flood the pot/container

Drip Irrigation
In all instances, allow enough water to soak well into the ground. Time how long it takes.
Drip irrigation is recommended to if affordable.

The water feeds just the base of the plant, doesn't splash onto leaves
Stop if water over-runs or floods

Let it Seep Deep

- The water must seep down to about 20cm into the ground to feed the roots
- Better to water alternate days or once a week
- Not advisable to water every day
- Check dryness of soil; water.

How to test water depth in soil
You can use the finger test or one of those Chinese chop sticks or improvise. Mark off 8, 10, 15 and 20 cms on whatever; piece of clothes line/fence wire, like your car engine dipstick! Dip/drive down into soil and check the depth.
First to 8cm, then 10cm and so on. The height at which the stick will be wet should indicate how deep the water has soaked into the ground; 15-20cm deep is fine.

NB: The water you use should preferably be free of chlorine; if available, borehole/underground water.
If small areas or pot plants, allow the tap water to stand overnight in container to clear of chlorine. If you can afford a water tank or couple (JoJo), collect rain water from the house downpipes.

Did You Know?

What are the plastic codes in South Africa?

Plastic products have POLYMER codes, NUMBERED 1-7. Codes 1, 2 and 4 are COMMONLY recycled across South Africa. Codes 3, 5, 6, 7 can be recycled, but are currently NOT EASILY RECYCLED in South Africa because of FEW SUITABLE recycling facilities. Bottles and jars for cooldrink, detergent, juice, water and food.

Advisable to disinfect/ rinse out plastic bottles in case of bacterial contamination or unduly high magnesium presence.

CHAPTER 8

COMPANION PLANTS

What Is Companion Planting? See also: Companion plants: Yates, Australia; yates.com.au – Companion planting is when two plants are grown near each other to benefit one of those plants or both– so the benefitcan be one way or mutual. This is a tried-and-tested way to reduce pests, attract pollinators, and boost growth!

Here are some common examples:

Crop	Companion Plants
Asparagus	Basil, marigold, oregano, parsley, tomato
Beans	Corn, tomato, eggplant, carrot, cucumber, pumpkin, radish
Cabbage	Sage, dill, beet, peppermint, rosemary, corn, spinach, sunflower, nasturtium
Carrot	Onion, chive, rosemary, radish, nasturtium, cilantro
Celery	Onion, cabbage, tomato, bush bean, nasturtium
Corn	Beans, marigold, sunflower, cucumber, nasturtium, squash
Cucumber	Beans, dill, marigolds, radish, chives, zucchini, peas
Eggplant	Beans, marigold
Kale	Sage, dill, beet, peppermint, rosemary, corn, spinach, sunflower, nasturtium
Lettuce	Carrot, garlic, peas, radish, strawberry, onion, chive
Onion	Beet, carrot, lettuce, tomato, watermelon, eggplant
Peas	Apple, carrot, radish, raspberry, turnip
Pepper	Basil, garlic, onions, radish, nasturtium, cilantro, marigold
Potato	Basil, beans, corn, nasturtium, cilantro, marigold
Spinach	Strawberry
Squash	Beans, nasturtium, mint, radish, dill, basil, sunflower
Tomato	Basil, marigold, nasturtium, carrot, garlic, chive

Benefits of Companion Planting

There are plenty more good reasons to plant certain crops together:

1. **Deterring pests**: Certain plants act as insect repellents (vampires!) or deter critters (watchdogs?). For example, garlic's smell is unappealing to many pests.
2. **Attracting beneficials**: Some plants also attract beneficial insects. For example, borage attracts pollinating bees and tiny pest-eating wasps.
3. **Shade regulation**: Large plants provide shade for smaller plants needing sun protection. For example, corn shades lettuce.
4. **Natural supports**: Tall plants, like corn and sunflowers, can support lower-growing, sprawling crops such as cucumbers and peas.
5. **Improved plant health**: When one plant absorbs certain substances from the soil, it may change the soil biochemistry in favor of nearby plants.
6. **Improving soil fertility**: Some crops, like beans, peas, and other legumes, help to make nitrogen more available in the soil. Similarly, plants with long taproots, like burdock, bring up nutrients from deep in the soil, enriching the topsoil to the benefit of shallow-rooted plants.
7. **Weed suppression**: Planting sprawling crops like potatoes with tall, upright plants minimizes open areas, where weeds typically take hold. (Google –)

Companion planting is a great way to maximize the efficiency of your garden. For almost every vegetable you grow, there is likely to be a beneficial companion plant that will help increase soil nutrients, chase away pests, and help you get the most out of your garden – Bing - Companion Planting Guide - Farmers' Almanac (farmersalmanac.com)

CHAPTER 9

WEEDS

Weeds are seen as leeches, parasites, curses, etc; whether in your garden, fields or paved yard.
They can be stubborn to get rid of completely and require a lot of patience and trying. Highly advisable to use gloves, boots and fireproof, protective clothing, eye cover, etc when on your war path!
When applying/spraying, just ensure that the adjacent plants/flowers are not contaminated, whether by over-spray or the liquid flowing into the soil.
The most popular, tried and tested are:

- USE ACIDS; mix about 2 tablespoons of lemon juice in in cup of white vinegar. Spray directly onto the weeds so they wont affect other plants and flowers.
- BAKING SODA; sprinkle about a teaspoon around (roots) and on the plant. This is fine for drive ways where there are no other plants.
- DRY OUT; put your weekend alcohol to better use! Spray mixture of 2 cups water to 1 tablespoon of pure alcohol and spray on the weeds, which should dry out. Thereafter, pull them out easily.
- BURN OUT; you can boil a kettle of water and pour around the weed, enough to soak deep into the soil. Do this on 3-4 consecutive days. Once the soil is soaked and loose, you can hank the weeds out easily. This is about the most apt solution.
- FLAME TORCH; instead of above, you can follow the Devil's route and burn them out! Invest in a heat torch, gas or paraffin flame gun. Apply the heat/flame directly onto the weed. Exercise care with the flame, they don't catch onto other plants or dry bush….or your clothes.
- Like vinegar and baking soda, this is an enhancement! A little more than half cup of common salt, 2-3 tablespoons dishwashing liquid, 4 litres of cleaning vinegar mixed in a 5litre container. Mix thoroughly and use as needed in a spray bottle…over the weeds…soak them! You will have to repeat until they kaput!

WARNING! AVOID CHEMICAL PESTICIDES AND HERBICIDES! **Glyphosate, the active ingredient in the weedkiller *Roundup*, is showing up in pregnant women living near farm fields – that raises health concerns!**

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CHAPTER 10

PRUNING AND GRAFTING

1. PRUNING

How To Correct Pruning Mistakes, Gardening Tips & Information By: Teo Spengler

When you prune a plant you cut foliage, branches, or trunks to make the plant more attractive and structurally stronger. Good pruning minimizes damage to growing plant tissue; manicure, pedicure and hairdo for plants! Bad pruning creates problems for the plant. If you've pruned your plants inappropriately, you may be wondering how to correct pruning mistakes.

Failure to prune tops the list of common pruning mistakes. It can lead to overgrown shrubs or trees that are too tall. The solution to this issue is to prune.

Removing old, dead, and damaged branches will stimulate the plant to produce new wood.

Never take out more than one-third of the canopy of a tree in a season. If an overgrown bush or tree requires more, prune another third the following year.

Pruning at the wrong time – The best time to prune a tree varies, but it is usually in winter or early spring. That's because many trees go dormant or stop growing in winter. If you make serious seasonal pruning mistakes and prune a tree in summer or fall, you may have removed buds, flowers, or fruit.

The solution is to wait until winter and prune again using thinning cuts or reduction cuts. The former takes out an entire branch at its point of origin on the trunk, while the latter cuts a branch back to a lateral branch.

Making the wrong cuts – The ultimate in bad pruning moves is to top a tree. Reducing the size of a tree by cutting the top of its primary leader creates far more problems for the tree than it solves. If you top a tree, you'll find that it creates a variety of waterspouts or new vertical branches to replace the one removed. These compete for dominance and, as they do, compromise the structural integrity of the tree. The solution is to choose a new leader yourself and offer it support. For conifers, tape a branch from just below the pruning wound so that it stands vertically. In time the branch will grow straight up naturally and serve as the leader. In deciduous trees, select one of the new leaders and cut back any competition.

Read more at Gardening Know How: Repairing Bad Pruning:
How To Correct Pruning Mistakes https://www.gardeningknowhow.com

2. GRAFTING

Grafting entails taking a shoot/branch from a plant/tree, and growing another into it…and removing to plant as a separate tree/plant!

It involves splicing and joining the cut stem into the tree branch. After a few tries, you can be adept at it by watching the numerous videos on Google.

Different plants/trees require different techniques. However, the standard splice, insert and tie up is applicable to most.

It is important that utensils used are disinfected to avoid transferring diseases or contamination!

Certain fruit trees can be cross-grafted, like citrus; lemon to orange…grape fruit, lime, etc.

It is best to consult your nursery or garden shop on how to graft citrus with 'budding'.

Shoots normally take between from 5-7 days.

Grafting fruit trees and selling the saplings can be rewarding and provide a good side income!

CHAPTER 11

THE BEE FACTOR

Without bees, there is no agriculture…or life!
Bees don't ask for wages, overtime or trade union hovering over your head!

If you notice bees in your garden, do not be afraid or shoo them away! Just carry on without trying to fend them off…they will stick quietly (buzzingly!) to their task!
Should you have a large yard, it will be a good idea to place a hive or two at an isolated corner. A single bee hive can produce between 15-60kg honey per year! Plant flowers (perennials) around/near the hives.
Teach your children about the role of bees in our agri world as well.

In view of the importance of bees, here is some valuable advice regarding honey.

Is Your Honey Real or Fake/Fong Kong?

By Joseph Mercola, 12/9/2023, Updated: 12/11/2023

Up to 70 percent of this popular food is fake or adulterated, meaning you're not only missing out on all the therapeutic benefits, but you're also consuming a deleterious food.

So how can you spot the difference when even the "watchdog" is compromised?
Honey will crystallize within a few days if open to air; and within a week or two.
It will not flow easily.
Fake honey will dissolve easily while pure will sink to bottom often as a clump.
Fake honey placed on a paper towel will absorb the added liquid.

- Honey is the third most-faked food in the world. Tests have revealed 50 percent to 70 percent of all U.S. honey is fake or adulterated.
- Honey can be faked and adulterated in many different ways. Common strategies include diluting the honey with sugars or syrups, or feeding corn syrup to the bees rather than allowing them to forage for pollen.
- Inexpensive, low-grade honey can also be filtered and then dusted with high-grade pollen from another location to obscure its origin. Oftentimes, honey labeled as "local" is, in fact, cheap honey sourced overseas.

- To ensure authenticity, buy honey from a local beekeeper. You'll typically find them at farmers' markets. (Mercola.com)

DON'T HEAT HONEY!

In making home remedies, where some ingredients have to be heated/boiled; never add honey into the mix! Add only once the mixture cools down. Adding honey to hot tea/milk, etc is just as pointless! If honey is heated, it loses its nutrients and anti-bacterial properties. Also, there is no benefit in honey added to cookies/cakes that are baked or subjected to heat.
Heating up to 40°C (104 F) destroys invertase, an important enzyme. Heating up to 50°C (122 F) for more than 48 hrs. turns the honey into caramel (the most valuable honey sugars become analogous to sugar).
Heating honey higher than 140 degrees F for more than 2 hours will cause rapid degradation.
Water boils at 100° C (212° F) for comparison.
20 Aug 2019- Bee Health Extension - https://bee-health.extension.org›

CHAPTER 12

MARKETING AND PRICING

The intricate web of agricultural marketing dynamics can be mystifying; lead you to bankruptcy or, undreamt of success!

The basic economic principle of supply and demand is crucial in understanding agricultural markets.
The agricultural market is a complex system influenced by various economic factors. But did you know that some key economic principles play a significant role in shaping the dynamics of the agricultural market?
According to Chiko Chiobvu, an agricultural economist, the economy has to do with resources available to society and how those resources are distributed to benefit the individuals of that community.
He explains ***production, distribution, and consumption*** are ***three critical societal functions in an economy.***
Without one of these functions, the others lose meaning and the system fails- *Octavia Avesca Spandiel 2nd January 2024 in Farmer's Inside Track*

Let's analyse these in our South African situation!
PRODUCTION; virtually all produce (fruit, vegetables, and herbs) are supplied to the major national chains by farmers. The chains have supply contracts that favour them. Recently, some chains started procuring from PDI farmers, such as lettuce, spinach, carrots, etc.
Most of us have this hurdle; we lack experience in cultivation techniques, marketing, pricing, environmental surveys, export know-how, and experience, etc with a good dose of passion and commitment!
This is the reason many who venture into the agriculture sector (the favoured or blessed) with land and grants, fail dismally.
I have been to various areas with my late friend Rafiq Bhayat;
Klerksdorp; at least 3 broiler farms and tunnels. The one newly built extending over 200mt in two sections with steam stove. Stripped of everything; the lighting, side walls, Eskom cables, 8 pumps, etc. The tunnels were abandoned and overgrown with weeds. These were given to cooperatives who obviously had no inkling of biosecurity, rearing broilers, etc. An abattoir to handle 10,000-20,000+ chickens per day…dilapidated and abandoned also!

In the ***Eikenhof/Walkerville*** areas; the first plot, had no activity, an unkempt yard, no electricity, and the house inside walls cracked and damaged. Another, a chicken house with side curtains, feeders, and drinkers…abandoned. The abattoir was newly built, and never used! In the third case in the Univille area, no agricultural activity but empty structures are there.

To reach parity, it is another good few decades once our training colleges are in place and recipients concentrate on the activity and be accountable or monitored.
The solution is to educate, motivate, and co-opt our urban and rural communities into self-sustenance veggie patches or rearing broilers from their backyards.

A proactive Government can kick start by presenting workshops to residents, schools, workplaces, etc, and initiate food gardens or community mini agri-parks. Promote self-sustenance among schools, businesses, and hotels, encourage the various communities; to start in their mosque, temple, church, synagogue, or other places; subsidise with a grant to cover the cost of seeds, compost/fertilizer, shade netting, garden tools, etc. The harvest they can then distribute among the community, learners, and staff, or sell to generate income.

In creating and reinforcing awareness and interest, our people can thereafter apply for land and go commercial. Instead of supplying the chains, they can have weekend markets for residents and even supply spaza/ township shops. This would mean lower prices and savings on transport to get to the chains or bulk markets.

DISTRIBUTION; most farmers have their own trucks, or, the chains send their bulk horse and trailer to pick up. The milk supply chain is classic example. The dairy farmer will supply the chains. That price in turn is virtually doubled or tripled when it is placed on the chain's shelves. Cost of sales, such as delivery/transport, store overheads (Staff, rental, electricity, etc) are added on in a technical matrix of income and operating expenses + mark-up = profits! Not so?

Most large cities also have bulk markets where farmers send their produce to agents. These agents will procure the best price in terms of supply and demand and collect a commission. The farmer gets paid by the bulk market office.

CONSUMPTION; the consumer is said to be king! Not in the fruit and veggie sector! Farm stalls are far from their urban/township places; much quicker and convenient to visit the local outlets!
Recently, an increasing number of city dwellers are turning to backyard organic and food gardens. Even businesses are promoting rooftop gardening for their staff!
Such initiatives are to be encouraged and supported by the government and public sector.

Until the consumer transforms into a producer, s/he will continue to be exploited with high prices of mostly contaminated veggies. Allegations are that they even withhold stock during peak periods, such as Christmas and other religious events, to push up prices!

PRICING
If you are producing more than your needs, you can…

- Distribute to family friends, local charity groups, pensioners, etc
- Or, sell if you need the income.

So…***how do you price your produce?***
Large, commercial farmers will consider their costs, such as purchase price of seeds/seedlings, labour, transport, property rental/lease, water usage, fertilisers, equipment (tractors, machinery, etc), electricity, etc….deducted from the income (sale of produce).
As a backyard producer, check the prices of the item with local suppliers; chains, fresh produce shops, or on the internet. The Johannesburg Bulk Market Daily Sales Bulletin also-
https://www.google.com/search?q=johannesburg+bulk+market&oq=johannesburg

As an indicator; the chain store price is usually 30% or more.
Here is an example of a lettuce head…

Shoprite		R18.99
Spar	400g	R19.99
Pick n Pay		R19.99
Joburg Market	500g	R11.99

The farmer's cost should be about R6.00
Your cost from the backyard cabbage patch….R3.00 at most!
Plus it's pure organic, nutritious, and pesticide-free!

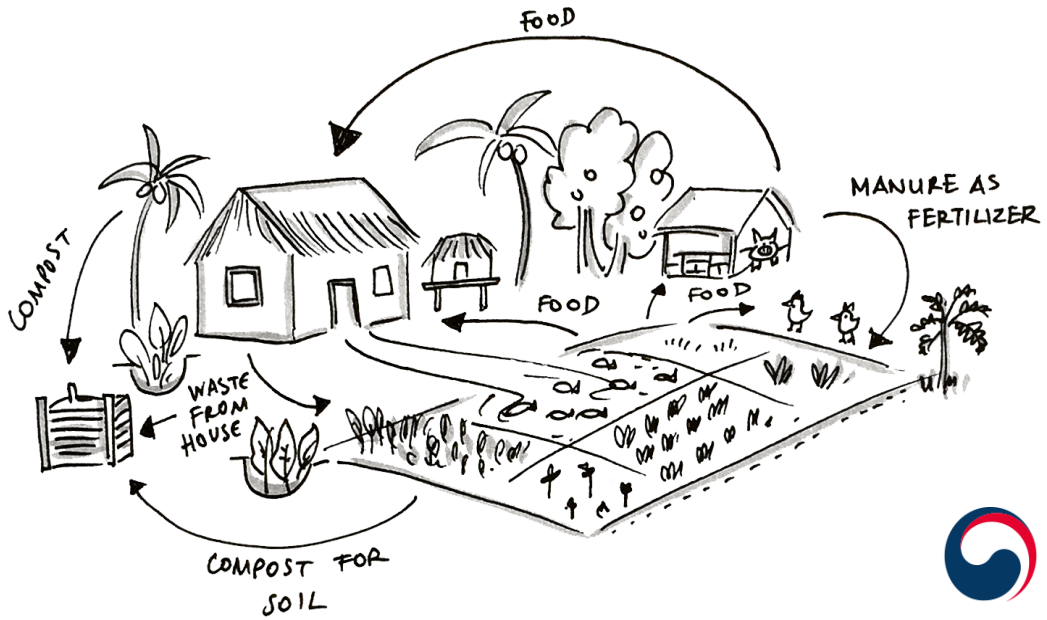
A suggestion is; to find out (or Google) when and where are farmers' weekend markets are in your area. They should be far cheaper than the local chains. Also, confirm with the farmer that they are organic and/or pesticide-free.
Be a bit forward and ask where situated and if you can visit with friends and family to buy directly!

CHAPTER 13

1. INTEGRATED FARMING

What is an Integrated Farming System (IFS)?
'An integrated farming system (IFS) looks at the whole farm as a system and how different components work together to enhance ecosystem functions of the land at local and possibly landscape levels. For example, where 'animal waste' from one area can become 'resources' for another area, e.g. organic fertilizer for home gardens'- Kiribati, Korea.

IFS is based on improved local recognition and understanding of mixed crop-livestock interactions, as well as selecting appropriate seed varieties due to local climatic risks. In such a system, the objective is to maximize the yield of crops, livestock and fish, which are combined to complement each other.



Ministry of Agriculture, Food and Rural Affairs

Prepared and produced by Kiribati Outer Islands Food and Water Project (KOIFAWP) and the Kiribati Agriculture Department

Tanaea, Ministry of Environment, Land and Agriculture Development (MELAD), Republic of Kiribati

If you on a small holding, this is what you can plant on your plot.

2. MICRO (SELF-SUSTAINING) & MACRO AGRICULTURAL PROJECT INTRODUCTION

How to Start a Permaculture Garden in 8 Steps
Permaculture is: Our emphasis on organic, responsible agri-techniques, and, promoting sustainability, like our ancestors/indigenous.
There are a whole lot of new techniques and technical terms in the agricultural sector now.
We just got to watch and be wary of coming to terms with them.
Yes, training future farmers,give the rod;

'*Teach them how to bind the eyes on the rod, what type of bamboo, the fishing line and its strength, which fish and size, what type of hook and how big, bait for sea and rivers, how to cast, where to fish, how to cook the fish, etc….Effectively, the whole gamut in terms of education and product knowledge!'*

There are eight basic permaculture gardening techniques for getting started with a sustainable garden.

1. **Acquaint yourself with your surroundings**. Familiarize yourself with the native plants, insects, and predators that inhabit your region and planting area. Observe which parts of the garden get the most sun. Identify slopes in the landscape that could cause rainwater to pool. Are there any unique features of your garden area that could be beneficial? For example, you may have tall native plants that can act as a living trellis for a new plant in your permaculture system.

2. **Choose plants based on your environment**. When deciding what to plant, do some research as which annual and perennial plants will thrive in your surrounding habitat. Practice companion planting by choosing crops that attract beneficial insects, deter pests, and naturally fertilize your soil. Plant flowers that attract butterflies, grow herbs that repel harmful insects from fruit trees and choose nitrogen-fixing, green manure crops that will gradually increase the nutrients in your soil over time.

3. **Design your garden layout**. Once you're familiar with your surroundings and know the plants you want to grow, use that information to plan your garden's design. During the design process, consider your light requirements, water sources, and the existing landscape to determine where to grow each type of plant. Use plant stacking to maximize space: Grow herbaceous plants as ground cover, shrubs as a middle layer, and trees as a top layer.

4. **Build your garden beds**. Raised beds are ideal for permaculture gardening since you don't need to till the soil, thus keeping nutrients intact. Your raised beds should be six to 12 inches above the ground. An alternative no-dig gardening method to raised beds is sheet mulching. Sheet mulching is the process of creating a plantable area by layering compostable materials such as straw, cardboard, wood chips, and leaves over grass to build soil without disturbing the pre-existing tillage.

5. **Plant your permaculture garden**. Start by growing your taller plants first, so that shade cover is in place for any smaller plants that are sensitive to direct sunlight. Double-check your design to make sure plants with similar water and sun requirements are grouped.

6. **Add a layer of organic mulch to the topsoil**. Chemical weed killers don't align with the principles of permaculture gardening, so make sure you add a layer of organic mulch after planting to suppress weeds and keep your soil moist. Common types of mulch include leaves, newspaper, straw, wood chips, shredded bark, and grass clippings.

7. **Add compost without disturbing the soil**. Avoid chemical fertilizers and instead, use a natural compost filled with organic matter. Popular composting choices include manure and kitchen scraps that you can collect in a compost bin. Earthworm castings and worm tea are also great options, as they are extremely rich in nutrients and add beneficial microbes to your soil.

8. **Use an efficient and sustainable watering system**. Make sure you're using the minimum amount of water needed for your garden to thrive. A low-waste drip irrigation system is a great choice to directly water your soil with minimal evaporation. Collect rain run-off from your roof gutters that you can recycle into your watering system.
https://www.masterclass.com/articles/how-to-start-a-permaculture-garden

CHAPTER 14

VERTICAL FARMING, HYDROPONICS

1. VERTICAL FARMING

The way to go? Hanging Gardens of Babylon….here we come!

What Is A Vertical Garden?

A vertical garden, also known as a green wall or living wall, 'involves growing plants vertically on a structure or wall rather than in traditional horizontal gardens,' says Autumn Hilliard-Knapp, horticulture specialist at Perfect Plants Nursery. 'This space-saving technique allows for a lush and visually appealing garden using vertical surfaces,' Autumn adds. Indeed, living walls are a brilliant way to add more plant life to a small yard, especially for those looking for novel garden wall ideas.

We have refined the concept to be organically compliant, designed, and structured for multiple hanging gardens to increase capacity and output without negative environmental effects; see Tips and Ideas #25.

Living walls are generally made up of plants grown in containers or trays, sometimes hung or grown on shelves. Importantly, 'vertical gardens can feature a variety of plant types, such as flowers, herbs, vegetables, and succulents, and provide benefits like improved air quality and noise reduction,' Autumn continues. While this is a useful and practical way to maximize growth in a small yard, there are practicalities for those considering how to create a vertical garden- (Homes&Gardens).

One of the biggest problems with vertical container planting is cost of set up and operation; in our improvised version, we overcome that by inserting cotton string as a wick to draw up water and keep the soil moist. Also, instead of coir and other liquid substrates (hydro), we suggest a mix of garden soil with compost and organic fertilizer. Nutrient depletion also occurs over time and the soil may need to be amended or replaced when re-using the system the following year. The old soil can be added to your compost heap and cured for the next cycle. The container should be disinfected, and dried out properly, and new soil/compost mix filled before starting with your next lot. Take this precaution so that diseases/infections are not transmitted.

Vertical farming dates back thousands of years, citing the example of the Babylonian Hanging Gardens built 2,500 years ago. In Asia, the Sky Greens located in Singapore is one good example of an advanced vertical farming system, helping the country rely less on imports for its food supplies.
Also, Chinese state media recently reported that the country's scientists have established the world's tallest, unmanned vertical farm in the southwestern province of Sichuan. Standing 20 stories, the vertical farm was built with oversight from the Chinese Academy of Agricultural Sciences in a downtown part of the provincial capital, Chengdu.
Chinese state broadcaster CCTV reported that Chengdu's vertical farm utilizes a range of technologies ranging from an automatic nutrient-supply system, energy-efficient artificial lighting that can emulate natural conditions, and a control system based on artificial intelligence.
We have ample land and generally suitable soil. The logical route would be to set up vertical farming or hanging gardens, with a mixture of soil, compost (manure) and fertilizer. A drip irrigation system can be incorporated. That would cut down costs of nutrient fertilizer liquids (much costlier as in hydroponics), labour and water.
In India, they used 20cm+ diameter plastic sanitary tubes, filled with soil and compost, with holes on top for the seedlings/plants.
These tubes can also be used upright with holes punched / heat cut on sides, filled with soil/compost and the seedlings placed therein.
Use your imagination!
A solar system can be included for grow-light stimulation and temperature control with fans and heaters to accelerate the harvesting time; comes at a price since solar systems don’t come cheap! Will be worth doing so if you intend planting such as English cucumbers, water melons, strawberries and similar that fetch a higher price and harvest within 3 months.

A vertical garden can boost production by 2-10 times (depending on the type of vegetable/herb) and by using far less space and water than if planted on the ground.

What foods can I grow in a vertical garden?

Below are some of the foods that have grown successfully.

VEGETABLES • Beans • Carrots • Cucumbers (miniature) • Eggplant (miniature) • Garlic • Onions (miniature) • Peppers (compact varieties) • Tomatoes (cascading / patio)

GREENS • Cabbage • Kale • Leaf Lettuce • Mustard Greens • Romaine Lettuce • Spinach • Swiss Chard

FRUITS • Musk melon

HERBS for sunny walls (typically South or West-facing) • Basil • Beebalm (Bergamot) • Borage • Chervil • Chives • Cilantro • Cumin • Dill • Lemon Balm • Lemon Grass • Marjoram • Mint • Nasturtium • Oregano • Parsley • Rosemary • Sage • Savory • Stevia • Thyme • Wheat Gras

MEDICINAL And THERAPEUTIC • Aloe Vera • Borage • Calendula • Catmint • Chamomile • Echinacea • Goldenseal • Hyssop • Lavender • Patchouli • Scented Geranium • Sweet Woodruff • Yarrow

2. HYDROPONICS

Hydroponics is the technique of growing plants using a water-based nutrient solution rather than soil, and can include an aggregate substrate, or growing media, such as vermiculite, coconut coir, or perlite. Hydroponic production systems are used by small farmers, hobbyists, and commercial enterprises- Google.
There are six main types of hydroponic systems to consider for your garden: wicking, deep water culture (DWC), nutrient film technique (NFT), ebb and flow, aeroponics, and drip systems.

(a) Wicking
A soft fabric / cotton string that feeds the plant in the system.
The wick absorbs the water and nutrients.

(b) Deep Water Cutlure (DWC)
Plant roots are suspended in a solution of nutrient-rich, oxygenated water.

(c) Nutrient Film Technique (NFT)
pump to circulate a thin film of nutrient solution through shallow channels, where plant roots can dip to receive nutrients.

(d) Ebb and Flow
periodically floods and drains the plant roots with a nutrient-rich solution. The system involves placing plants in pots filled with soil, perlite, or coconut coir, which are then set in ebb and flow trays or containers.

(e) Aeroponics
Here, the roots are not touched by water in the troughs. Instead, they hang in the air and are sprayed with nutrients!

(f) Oxygenated Water
Dissolved oxygen helps plants achieve and maintain a normal growth rate. Without having access to enough dissolved oxygen, plant roots could die, which mitigates the benefits of using a hydroponic system.

Excess oxygen will also kill the roots!

***Hydroponic smart farming gains momentum in South Africa*.**

In a world where no seed touches soil to germinate, hydroponic smart farming is gaining momentum and revolutionizing South Africa's agricultural landscape. This innovative method produces high yields while reusing water. The concern is; what is the nutrient content complement?

Tebogo Masobe from Lomanyaneng, outside Mahikeng in the North West, is passionate about innovating and using smart farming to grow vegetables without using soil. Masobe says the soilless method of planting is working for him.

"The specific crops that I grow, your leafy plants, are either your herbs or your edible flowers, lettuce, spinach, cabbage, green pepper, and all your leafy plants. There are actually more advanced systems that actually grow potatoes under water but that is on an advanced level. Right now, we are only dealing with leafy plants and herbs." Masobe says even with limited space and other challenges, farmers can still increase their yield using this farming method.
"The unique advantage of operating hydroponics farming is that the system is solar powered, so we are not affected by load shedding, we do not solely depend on electricity. We are actually creating our own energy source; it is fully automated. With this system, we can actually make use of small spaces. With hydroponics, I can grow more produce in the smaller space as compared to your conventional farming whereby you would need a hectare of land to actually produce a certain number of crops. We are taking advantage of vertical farming instead of planting these crops horizontally; we are making use of our space."- SABC.

Not only start-up costs, but operation requires expert monitoring and control, the soluble nutrients are expensive, the electric pump system can pack in (technician's rate for call out per hour prohibitive), etc…resulting eventually in loss of production/damages/loss.

CHAPTER 15

PESTS, INSECTS, RODENTS…

Pests for the gardener are included free in the farming package… and can be a pesky headache!

Let's list some…

3. ***Rats and Mice;*** rats are too sharp to all fall into a trap. However, they avoid certain smells, such as peppermint oil, cayenne pepper, black pepper, or cloves. You can also use chemicals; such as anti-coagulants (example warfarin) and non-anticoagulants. There are other methods, such as glue pads and the age-old rat trap. Rats don't necessarily go for cheese and can be fussy if there is something more delicious around. Peanut butter they love! So, vary the bait until you gotcha!

   Baking soda is deadly to mice and rats. Mix equal amounts of baking soda, sugar, and flour or cornmeal in a container, then add water and make the mixture into snack balls and place where they hang about.
   Rats also hate the smell/scent of essential oils like peppermint, citronella, and eucalyptus, besides hot pepper.

4. ***Dust Mites and Dust;*** Dust is not just dust; it can contain a variety of stuff; pollen, mold, skin cells, fibres, mites, 'flu bug, etc. It's possible to be allergic to just the mites, dust as a whole, or both. They can contaminate plants or animals carried by dust or with contact. Said to be arachnids (millions!) that can be found on your bedding and mattress! However, they themselves are harmless; it is their faeces that can result in allergies. Like pollen grains, mite faeces/droppings float in the air inside the dust. You can be infected but won't even know!

   The best is to control dust (the carriers) in your homes. Wear a mask always. It is the droppings in dust that make one sneeze. If you are allergic to pollen, then chances are also to mites!

   Dust Absorbing Plants:
   - Aloe Vera, Chinese Evergreen, Betel Leaf, Ferns, English ivy, Rubber plant, cactus, succulents, etc.

   Contributions by By **Mary Cornetta -** Monika Stuczen, senior research scientist at Dyson, Published on November 11, 2023

5. ***Companion Planting;*** This is your answer instead of toxic pesticides. Aphids can devastate tomatoes and even aloe and other plants. Nasturtium is the choice as it attracts the aphids away from other plants. Daffodils, marigolds, fenugreek, mint, basil, chives, onions, garlic, dill, thyme, lemon grass, citronella, geraniums, lavender, rosemary, chillis, etc are pest deterrents. Check the Companion Plants chart and Google which does what or is suitable.

6. ***Baking Powder/Soda;***

has many applications and is safe…

- Cabbage worms- Equal parts flour and baking soda for broccoli, cauliflower and other brassica family. Dust the leaves with the powder

- Fleas - Equal parts flour and baking soda with salt added. Mix and sprinkle over the flea ridden areas (like rugs, mats and carpets) to eliminate them.

- Cockroaches – love dark and damp areas. Mix 2 tablespoons of sugar and baking soda together before adding water to turn it into a paste, then leave the sweet pulp where they are frequently spotted.

- Snails and slugs - Baking soda is fatal to snails and slugs, as the powder dries out their slimy bodies. Sprinkle around the plants or border of the garden. Bicarb comes into contact with their slimy body and dries its out! Garlic spray also works!

- Ants – baking soda mixed with some sugar, sprinkled or mixed in water and sprayed, around doors and windows will do the trick…it will dehydrate or deter them. Cinnamon and baby powder are also recommended; sprinkle on path. Cucumber is also claimed to deter; liquidize and sprinkle..

- Silverfish - a natural silverfish repellent. Sprinkle on drains, rocks or in kitchen cupboards, bathrooms, flooring boards, carpets, etc, in homes. In gardens, sprinkle on the surrounding soil. Sprinkle salt as well to keep surfaces and crevices dry and dehydrate the eggs. Cucumber sliced, liquidized or water sprayed also deters silverfish. Silverfish are the kind of bugs you don't want in your home, given their ability to wreak havoc. As they are attracted to fiber and sugar-rich foods, they quickly contaminate unsealed packets of pasta, rice, flour, and carb-rich items. They are also notorious for destroying books, cardboard boxes, wallpaper, carpets, and more; spread table salt wherever you see them!

- Rabbits - are known to rummage through gardens and pick at greens, flowers, produce, and bark. However, these fluffy animals are not a fan of the taste of baking soda. Spread around plants and re-apply after rains.

- Centipedes - Centipedes are attracted to damp, hidden places like drains and piles of leaves. Because of this, they may be found lurking in your shower or sink. Sprinkling baking soda on carpets before vacuuming can eliminate the excess moisture in your home that attracts these leggy critters. If they are crawling through your pipes, you'll need ½ a cup of baking soda and 1 cup of white vinegar. Pour these two household items down the drain separately, and as they combine, the mixture will release carbon dioxide that eliminates the centipedes.

- Hornworms - love to snack on leafy greens. Dust baking soda directly onto their bodies or the eggs to kill them. A mixture of equal parts flour and baking soda also creates a deadly snack that you can sprinkle around your yard to repel these worms

5. ***Aluminium Wrap:*** Yes, for those egg laying and voracious insects and pests! Wrap a piece firmly but not tight, around the bottom main stem. Smear some soap and white vinegar mix around to deter them crawling up. With slugs and snails, use baking powder recipe!

6. ***Mole Removal;*** just sprinkle your left over coffee grounds on the mound and around the yard!

7. ***Mosquitoes***: hate lavender and pure vanilla extract smells. Plant as companions. In homes, burn lavender incense.

8. ***Flies:*** mix cayenne pepper in water and spray. Lavendar and lavender incense also said to help.

9. ***Moths:*** moths don't like cedar. They also don't appreciate lovely dried lavender in the closet. Make some dried lavender sachets and hang them inside your closet. Peppermint oil can be sprayed in cupboards and wardrobes.

BY JAHAIRA ARTHUR/NOV. 12, 2023 7:45 AM EST Muck Rack &-House Digest: https://muckrack.com/media-outlet/housedigest

CHAPTER 16

FUNDING AND BUSINESS PLAN

Below is list of agencies that can assist with funding; whether loan, grants, advice, training, etc. Each has it's own function/service.

However, it is important that in approaching any of them you require what is termed a Business Plan.
This simply captures your initiative, idea, project, costs…The people/organisations you approach will want to know if it will fly…and will get their money back… with interest!
Will you utilise it for self sustenance, create employment, opportunities for others, potential for growth/expansion, etc? If so, explain how.
The features, benefits and advantages of your project will determine whether the funder is convinced of its success, sustenance and survival. For this, the Business Plan will explain why you want to launch this venture, how much it will cost to purchase land (monthly re-payment on bond), starting stocks/inventory, the infrastructure, running expenses (operating costs such as salaries, electricity, transport, packaging material, consumables, etc).
All the expenses/costs must then be deducted from the income you expect to receive from the sales of the produce/items.
After paying such as loans, tax, leases, etc., what is left is your profit.

The ***Dept of Agriculture*** has the following guidelines for applications (for which you might require the services of a Chartererd Accountant or Professional Consultant!):

GUIDELINE TO 12 ESSENTIAL ELEMENTS TO FEATURE IN APPLICANT'S BUSINESS PLAN REQUIRING SUPPORT UNDER THE AGRIBEE FUND

1. EXECUTIVE SUMMARY

This section provides a brief summary of the business, legal status, background, description, concept, position, major achievements, etc. The statement should be kept short and all correct/relevant information to be provided.

2. ENTITY ANALYSIS

2.1. Describe the business in detail; what is it- manufacturing, retail, wholesale, office, etc.
2.2. Business history and ownership; who owned/owns it, experience and past history/financials
2.3. Location and facilities; residential, business, agricultural or industrial area. Fixtures & fittings, additions?
2.4. Road map and future plans; where you intend to take the business in 3, 5, 10 or more years. Continuity and contingency plans?

3. INDUSTRY ANALYSIS

3.1. Products and services; what are you intending to produce, or services to offer? Conduct an overview of these and if there is a need or potential.
3.2. Industry trends analysis; is it in demand or a glut?
3.3. Problem worth solving; how you intend to enter the market as different to create demand and survive?
3.4. Market segmentation analysis; how does it compare with others in all aspects?
3.5. Target market identification (business position in the market); local, whole city, rural areas, provincial, national, international or specific group, etc.

4. CUSTOMER ANALYSIS

4.1. Identify and analyse target and key customers and explain how the business products or services are going to meet their needs and generate sales
4.2. Outline future markets; will the population grow or are there areas for future expansion?

5. COMPETITIVE ANALYSIS

5.1. List and analyse business competitors; what sort of competitor? What is lacking among them that you can add value to entice their customers? Price, standard and quality of the product….?
5.2. Describe the business competitive and comparative advantages

6. SWOT ANALYSIS

6.1. Provide business strengths (you have the experience), weaknesses (no qualifications), opportunities (is there no such around?) and threats (from whom and how?), preferable in tabular format

7. RISK ASSESSMENT AND MITIGATION PLANS

7.1. Describe potential risks and provide mitigation strategies

8. ASSUMPTIONS

8.1. Describe assumptions made e.g. prices ; are they realistic?

9. MARKETING PLAN / STRATEGY

9.1. Describe business marketing plans or strategies and tools and explain how the business will acquire potential customers and retain existing ones; where will you advertise; local or national newspaper, radio, TV, social media, fliers, sword of mouth (bush telegram!), etc?
9.2. Sales plan; monthly promotions with prices slashed, competitions, lucky draw linked to cash sale invoice, etc.
9.3. Milestones (if any)

10. OPERATIONAL PLAN

10.1. Outline the production plan and /or production cycle
10.2. Suppliers of raw material
10.3. Logistics and distribution
10.4. Business growth and development plan

11. ENTITY AND MANAGEMENT TEAM

11.1. Provide organisational structure
11.2. Management team
11.3. Management team gaps
11.4. Personnel Development Plan (Skills plan)

12. FINANCIAL PLAN

12.1. Financial highlights

13. ANNEXURES

Attach verified copies of relevant documents where requested/applicable; Identity, Qualifications, Proof of Residence, Bank Statements, References (Original letterhead of company), Criminal Record, Title Deed, etc. In fact, be proactive and annex whatever you consider they might ask for.
Be honest as they are mostly professionals/trained and will easily pick up inconsistencies; admit shortcomings - will go for further training, haven't done that as yet but will try, had setbacks (personal), etc. Don't invent and try to impress with irrelevant info. If you transparent, humble and down to earth, you will likely get a sympathetic ear and your application will succeed.
If you required for personal presentation, go over the business plan again, look for possible errors/contradictions, correct and be positive. Ask a friend, family member, business person or other to examine, question and advise you.
If your application rejected, ask for reasons and if they will re-assess once you have corrected and verified. Be positive…each failure is a learning curve towards a better goal!

Here is brief motivation for an application to fund a Poultry Breeding Stock and Hatchery that was submitted to Dept Of Agriculture….and approved after 5 years! But they sent Broiler feed instead and promised day-old chickens…they still hatching?
Notice the research and motivational input. Names are not real persons and any reference is coincidental.

CHAPTER 17

CO-OPERATIVES

1. INTRODUCTION

One of the great challenges facing the agricultural sector is to increase the number and variety of viable and sustainable economic agricultural enterprises. The historical narrative is that it resulted in many interruptions in the development of agricultural enterprises, because of the destruction of wealth in black communities, especially in both rural and urban areas.

One important variant of these economic enterprises is agricultural cooperatives. Agricultural co-operatives are ideal institutions of people to create employment and empower people in improving their socioeconomic conditions.

The co-operatives can be instrumental in giving the poor women, youth and other marginalised members of a community a purpose and pride as a result of their financial independence and contribution to the economy of the country.

Individual farmers cannot consistently and reliably control the prices that they receive for their agricultural products or the prices they pay for the inputs required to produce these goods. In order to enhance their economic market power, farmers therefore often form co-operatives.

The guidelines will assist these farmers to form themselves into co-operatives so that they could be able to acquire available assistance from various programmes of government departments.

The importance of the formation and development of farmer organisations/co- operatives is to ensure that they have sustained livelihoods, can create jobs, mobilise resources, generate investments, for economic empowerment, enhance social reform and food security, promote SMME, etc.

2. WHAT IS A CO-OPERATIVE?

A co-operative is an autonomous association of persons united voluntarily to meet their mutual economic, social and cultural needs and aspirations through a jointly owned and democratically controlled enterprise organised and operated on cooperative principles (the dti). An agricultural co-operative is a co-operative that produces processes or markets agricultural products and supplies agricultural inputs and services to its members.

3. THE CHARACTERISTICS OF AN AGRICULTURAL CO-OPERATIVE

Association of persons
Voluntary basis
Mutual or common economic, social, and cultural needs
Jointly owned and democratically controlled enterprise
Co-operative principles

4. THE VALUES OF AGRICULTURAL CO-OPERATIVES

Agricultural co-operatives are based on the values of self-help, self-responsibility, democracy, equality, equity and solidarity. In the tradition of their founders, cooperative members believe in the ethical values of honesty, openness, social responsibility, and caring for others.
Produced by Government Communication & Information Systems (GCIS)

Aug 2019 2nd Edition *Funding Scheme for co-operatives* Written by Silusapho Nyanda

Primary co-operatives can now access funding of up to R1.5 million, thanks to a Department of Small Business Development's programme.

THE CIS

The Co-operatives Incentive Scheme (CIS) helps co-operatives access funding, provided they meet certain criteria.

The department said one of the requirements is that entities must be incorporated and registered in South Africa in terms of the Co-operatives Act of 2005.

The scheme is also said to be more favourable towards women, youth, and people with disabilities.

The department added that people who are historically disadvantaged, have projects in any of the economic sectors, have emerging co-operatives with a majority black ownership, and adhere to co-operative principles, have a better chance of accessing the scheme.

Co-operatives who want to apply for funding can download an application form from the department's website.

There are 3 levels of cooperatives; Primary, Secondary and Tertiary.

Read up more here: https://www.seda.org.za/WhatsHappening/Pages/COOPERATIVE-DEVELOPMENT-SUPPORT-.aspx

CHAPTER 18

LANDSCAPING

Front yard vegetable garden ideas – stylish ways to grow delicious crops

BY HOLLY CROSSLEY- CONTRIBUTING EDITOR; HOMESAND GARDENS.COM

Suggestions on landscapes are far too numerous on the internet

https://www.google.com/search?q=IDEAS+ON+LANDSCAPES&oq=IDEAS+ON+LANDSCAPES&gs_lcrp

Transform the front of your plot into a harvestable haven – no matter its size

Give the front of your yard some oomph with a vegetable garden patch, mixed with flowers and succulents, etc; to give it some purpose. Here are 10 tips that you can work on….

1. Build Beautiful Raised Beds In Your Front Yard

There are various materials you can use for raising; timber, bricks/blocks, concrete, plastic sheeting, etc. Ensure sufficient compost and fertilizer are mixed into preferably sandy soil. Drip irrigation tubing is suggested for watering.

Use your imagination, and check the edibles with flowers which are companions. The flowers will not only give impetus but also colour and attract bees for pollination.

Lindsey Chastain Founder of The Waddle and Cluck

2. Grow Crops In Pots

Growing in pots/grow/wooden boxes, etcs has the advantage that you can move the plants around for additional or less sun. Invasion by snails, slugs, insects, and other pests will be minimal.

You can try strawberries, tomatoes, peas, swiss chard, herbs, etc.

3. Add Personal Details To Your Front Yard Vegetable Garden

'Don't be afraid to get creative and use ornamental details to enhance your front yard veggie garden,' recommends Lindsey.

'Painted signs with the names of vegetables add a whimsical touch, while unique containers like galvanized buckets, wheelbarrows, and the hessian animal/dog feed bags allow you to grow potatoes, onions or herbs with vintage flair,' she says.

Use the plastic cool drink or 5-liter water bottles; paint them (use enamel paint, double coat preferably) in your national flag, etc…hang them up for detail. Empty hessian 25kg or 50kg bags can be the posit for your potatoes.

*The reason for painting the plastic container; if they to be kept outdoors, you will be sitting with algae. The paint protects it against the sun.

4. Admire Your View From A Bench

'Be sure to include seating like a bench or chair so you can relax and enjoy the fruits of your gardening labour,' says Lindsey. Plus, sitting out front can provide a pleasant view of the world passing by.

5. Throw Some Flowers Into The Mix

Many flowers make fabulous companion plants to vegetables

'I also love incorporating blooming plants like marigolds, zinnias, and nasturtiums to attract pollinators while providing a pop of colour,' says Lindsey. Include sunflowers, edible flowers, carnations, germaniums, and a fruit tree or two for shade.

6. Plant Fragrant Herbs Near The Entrance Of Your Home

'Basil, mint, rosemary, and thyme are excellent choices to start with,' says Autumn Hilliard-Knapp of Perfect Plants Nursery, preferably in pots There are lots of different herb planter ideas you can try

7. Install A Mini Greenhouse In Your Front Yard

Even a small greenhouse can provide valuable protection for crops over winter

For more ideas, visit- https://www.homesandgardens.com/author/holly-crossley

Read More: https://www.housedigest.com/628101/small-backyard-landscaping-ideas-that-will-transform-your-space/

CHAPTER 19

PRIMARY, SECONDARY AND TERTIARY AGRI-INDUSTRIES

The transformation from the plant to the complete products comprises three economic activities, i.e., **primary, secondary, and tertiary.**

Primary agriculture activity is the conversion of raw materials into food commodities.
The primary activities comprise the extraction and manufacturing of natural resources like fishing, gathering, and agriculture. The process of generating agricultural produce is biological in nature, and is, therefore, a primary agriculture activity.

Secondary processing is when the primary product is changed to another product – for example, turning wheat flour into bread, processing pickles, jams, polony, dehydrated fruit, vegetables, herbs, weaving cloth, etc. When the raw produce is processed, it gains additional value and is referred to as secondary agriculture. Some of the avenues of secondary agriculture are nurseries, abattoirs, bio-pesticides, bio-fertilizers, agro-processing, fruit and vegetable processing, micro, small and medium enterprises, beekeeping, agritourism, by-product utilization, waste utilization, etc.

Tertiary activities will offer support to both primary and secondary activities through its services such as banking, transport, trading, and advertising.
https://unacademy.com/content/cbse-class-12/study-material

CHAPTER 20

POULTRY AND LIVESTOCK

Poultry

The poultry business is a multi-billion Rand industry. To succeed, besides the market and financing, it requires strict biosecurity; one infection and …poof! Disaster and grief!

The industry entails not only chickens, but also ducks, geese, turkeys, quails, ostriches, etc and also wild birds, such as doves, guinea fowls, etc.

We will take a quick view into the birds, or, chickens. There are hundreds of breeds locally and globally…
https://farmingsouthafrica.co.za/50-best-chicken-breeds-to-farm-with-in-sa/
https://southafrica.co.za/indigenous-chicken-breeds.html

Chickens, of which we get various breeds and types, serving different purposes; broilers, layers, day olds (incubators and parent breeding stock), indigenous and for shows/exotic. Some of the popular breeds are Black Australorp, Boschveld, Khoekhoek, Lohmann Browns, Ovambo, Venda, Naked Neck, Rhode Island Reds, Leghorn, Plymouth Rock, Orpington, Sussex, New Hampshire, etc.

Broilers are breeds that are force-fed specially formulated, medicated feed and, within 6-7 weeks, they reach almost 2kg in mass!
To encourage feeding, the lights remain on for between 18-20 hours!
For the first 2 weeks, they fed starter. Next 2 weeks, grower and thereafter finisher which is non-medicated. Where previously, fish was source of proteins, now replaced with soya.
They are then sent to abattoirs from where they dispatched to butchers, national retail/wholesale chains, franchises, etc., or sold live.

Bio-security is of utmost importance as an entire lot can be wiped off in the event of an infectious disease. Also, there is always a shortage in supply of day olds and prices vacillate.

Free Range? Strictly speaking, free range chickens are those that our grandparents had as 'African fowls'! They were fed whole mealies or mixed crush. They roosted on the trees or where there was shelter (under/in scrapped cars!), in kraals/barns with the sheep, cows and goats…and even made it inside the house in a corner!
During the day, they scrummaged the yard for greens, insects, kitchen scraps, etc…they tasted good as they ate so good!

Layers are bred to produce the highest number of eggs at lowest cost per week or year. The major risk with layers, in absence of strict bio-security, is that if there is a disease outbreak, not lonely production drops, but there would be substantial loss (as with Bird Flu). Many operators have subsequently shut down or liquidated!
Layers only start laying when they about 20 weeks old. This means getting fresh stock will be a long wait; ready-to-lay pullets can cost from R200.00 each upwards to replace!

Day Olds/Hatchery
Which came first; the egg or the chicken?
With humans, the embryo forms within the female after mating. Similarly, a hen and rooster mate. The hen lays a fertilized egg which is incubated externally.
There are two ways the eggs can be hatched; naturally and artificially in incubators.

Natural; here, the hen gets 'broody' and sits on the eggs she has laid in a nest (usually between 1-12). Her body warmth assists to develop the embryo in the egg. While sitting on the eggs, she constantly turns or rotates the eggs.
After 18-23 days, the eggs hatch and fluffy, chirping chicks emerge from under her wings.

Once the eggs have all hatched, the hen takes them out for lessons in scrounging for feed and water.
Incubator/Machine bred; an incubator replaces the hen in the hatching of fertilized eggs. Thousands of eggs can be placed in an incubator, which was referred to as a 'machine bred' years gone by!

The standard incubator has…
Heater; to control and maintain the temperature constant, usually 37.5-39 degrees C. This is same as the mother hen's body temperature. Different birds have different days to hatching and even temperature levels. A sparrow between 10-14 days. A fowl 18-22 days. Ostrich 36-45 days. Snakes, some 40 days and others 70 days!
Water; this is to control the humidity as the developing embryo must not dry; normal is 60. If there is no humidity, the egg wont hatch as the egg shell will be hard; the hatching chick will not be able to crack (by pecking) the egg to open and emerge.

Fan; to regulate the temperature within the range.

Holding Trays; in which the fertilised eggs are placed with the sharper/pointed end down. These trays vacillate from side to side every 90 minutes to imitate eggs being turned under a hen.
Once hatched, the day olds are placed under a brooder (with heat lamps), vaccinated and then sold or carted away to be reared as broilers or layers.

The main constraints to the growth of the industry and entry (whether by black or white), can be noted as follows:

• Dominance by a handful of major commercial corporates that are linked with and control the entire process; from raising to finish (hatchery, broilers, layers, processed) via national WMC chains (White Monopoly Capital), such as Shoprite, PnP, Spar, Makro, and fast food franchises- McDonalds, KFC, Nandos, etc. This includes their monopoly of the feed mills and even the maize (GMO's- Genetically Modified Organisms) and sunflower farms.

• The restraints on getting credit: most PDI (Previously Disadvantaged Individuals) are untrained in accounting. Financial institutions and even the Land Bank insist on business plans. Having these from accountants / consultants can cost from R5 000 for a simple to R20 000+ for a detailed advanced one with pie charts, bars, graphs, financials, etc.

• High cost of feed. This sector is monopolised and prices dictated- the two major role players are Epol and Meadow Feeds (in turn Tiger Foods and Top Brands); the smaller suppliers follow suit.

• Solution is to plant your own maize, soya, sunflower, and greens for the feed

• The erratic, expensive, and unreliable Eskom electricity supply (load-shedding) impacts cold rooms, incubators, operation of automated equipment, temperature-controlled houses, etc. This results in massive losses at times and many go bust!
If our power supply was constant, there would be no justification to import chickens. All imported chickens must be labelled or, establishments (franchise outlets, restaurants, etc) must declare them as imported visibly; just like the kosher and halaal signages.

• Option is a solar power system or invertor with back-up batteries or petrol/diesel generator, both of which eat into operating profits.

2. Livestock and Game

This is a minefield and not for the novice! For instance, some animals prefer what is known as sweetveld grass and others sourveld/pasture. With others, happy with both.

Livestock:
Cows, goats, sheep, donkeys, and pigs we are familiar with as domesticated. Each comes in different breeds and serves niche areas/purposes. Most of our youngsters and even adults, don't even know the difference between a horse and a mule!
Cows provide meat and your milk, butter, and cheese! Most of the other domesticated animals are for meat and some for their skins as well.
Livestock in general require constant inspection, care, and vaccines. Besides, they can be bitten by snakes, struck by lightning, suffer heat exhaustion, eat poisonous plants, some don't agree with suurveld grass, be attacked by wild dogs, stolen, etc.

FROM THE ROAD…

Haji Hanif and Brother AK Maiter out in the fields advising enterprising residents. Kokatala Informal Settlement in ***Lawley, Jhb***. They desperately require a borehole.

Raised beds on black plastic sheets under a simple gum pole props structure with shade netting and side curtains. Can be converted into organic vertical

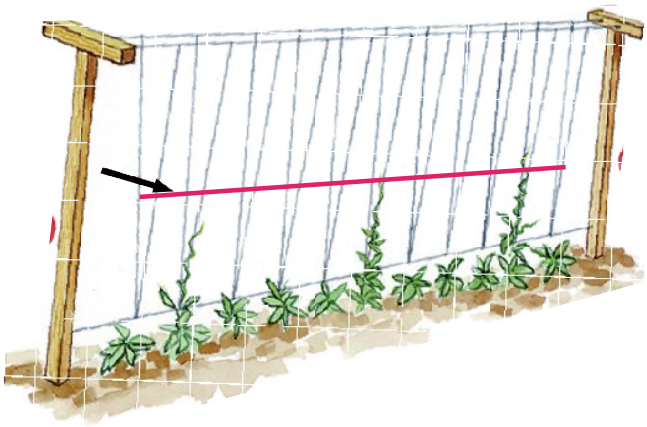
CHAPTER 21

TRELLISES

A trellis is a simple garden structure that helps your plants grow vertically. Although a trellis can be made from many different materials, it typically has an open framework, allowing for plants to easily grow upward.

Below are examples of trellises and suggestions on the material and how to set up.

Pig iron netting allows enough space for the plant to creep through. Here, it is tied onto uprights (which can be metal, wooden battens, plastic bamboo, etc). If using wooden, consider that it will rot unless treated. The bottom of the pig iron can be about 20cm from the ground. This will be fine for such as tomatoes, okra, cucumber and other climbers.



A trellis using wooden battens as uprights with a T on top. As you see the bootom is about 15-20cm off the ground. The string or thin wire for the trellis.
It is in a V shape with double lines on top. I would suggest that also strap a string or two across (arrow points to it) about halfway so the plant can 'rest' on it if too heavy!
The height of the trellis should be at least 1 metre off the ground. For indeterminate tomatoes, you might have to go up to 3-4 metres.

Thin poles put together in a conical shape over the plants. String is wrapped around the cone spiralling upward. The tripod cones can also be linked with string / wire to cover all the plants.

Double trellis on either side with wooden sticks across. Here again, string/wire can be used between for extra support (arrows). The more the 'traffic' supports, the better the crop.

Another variation for cucumbers so that they hang on without getting damaged. String net about 2-3cm. What ever you use, always weigh up the cost. A fancy trellis will hold up no different fruit from a 'cheapie'!

*Images; Google.com

CHAPTER 22

HOW TO: THE HANGING GARDEN

The procedure is very simple. 1. Make 2- 4 tiny holes at the base/bottom with soldering iron or piece of wire heated on a candle flame. Add your soil and compost, plant your seed and water. Leave outside on ground or stoep, etc. 2. As below, after the holes made about 7cms from base, make two holes on opposing sides for the string to hold the container and hang up. Add the cotton string inside for water to be drawn up

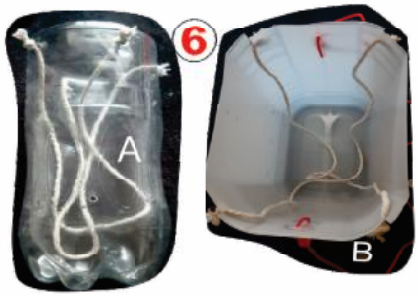
Start here: We have empty plastic bottles/containers (from 250ml to 5 or 20lt!), standing upright and lying sideways. We will show you how to convert

You need a cutting knife, scissors or sharp pointed knife, string and soldering iron. With A, the bottle is cut round the neck. With B,

Cutting the bottle flat/sideways is for herbs and short root veggies, such as spinach,

This is how A and B in 2 should look. The top is open. On B I have marked black dots which is where tiny drip holes will be made with a soldering iron tip or heated thick needle or wire. The holes (about 3 per side, are about 5-7cm above the bottom. In the next frame you will

These two holes are made on either side (circled). The holes are for the string to be threaded thru to hang the container. I suggest the nylon multi-stranded from the hardware. The cotton/fibre will fray with the weather. Note the white circle; there is a slit with knife or scissors of about



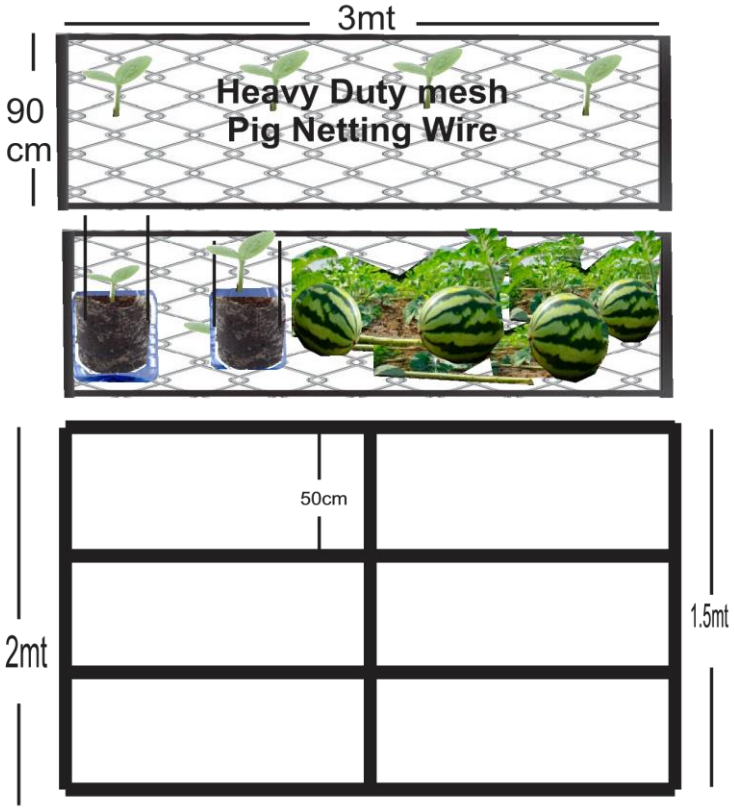
We are nearly done! A shows how the cotton string is inside the bottle. The depth of the bottle is about 20cm so cut 2 x cotton strings of 45-50cm in length. Make a knot on either ends. Then place in container and slide the knotted pieces into the slats you cut earlier; 4 in all on opposite sides. In B you looking into the container from the top, showing the white cotton string and the red nylon string on the sides to hang the container. Fill with mixture of 1:3 garden loose soil, potting soil and compost. Plant your seeds or

From:
This Idiot's Guide To Organic Farming -
Haji Hanif Manjoo (2024)
* In conjunction with AwqafSA

STEP BY STEP

1.Equipment; sharp knife, Stanley knife or scissors, soldering iron or alternative
2. Decide whether you want to plant short or long root veggies or herbs. For long roots, use container upright
3.With soldering iron, make about 3-5 tiny holes (1-2mm) 5-8 cm up from the base. These are breathing and water overflow.
4. Make make another 1 or 2 holes (depending on the mass/weight of the container) on opposite sides about 3-5 cms from the top.These holes are to be threaded with the nylon string for hanging. The heavier the soil, compoast/potting soil, the thicker the string.
5. Cut 4 x 2-3cm long slats into container at the top (as in 5), opposite each other. Measure/size and cut your cotton string to run from top to bottom to top as in 6A. Tie a knot and slide into the slats.
6. Mix snady garden soil with compost and potting soil in the ratio of 1:3.

HORIZONTAL GARDEN: WATERMELONS



HORIZONTAL GARDEN FOR WATER MELONS

You need 8x3mt gum poles for the front, 4x3mt gum poles cut into 1mt for the sides & centre so that the mesh does not collapse. Use 10-20mm long bolts (15-25cm) n nuts to join the poles. Speak to a carpenter or ask the hardware salesperson how to do so.

1. Get a mesh netting that is heavy/strong enough to take the weight of about 16-20 water melons ...pig wire netting 3mt x 90cm or more (not so wide that you cannot reach the centre!) You might have to reinforce with more than one cross member at bottom.
2. Build your stand as shown. Use bolt n nut at joints so the stand/unit doesn't fall over; must be very secure! The clearance height between each level/shelf should be enough about 50cm for water melons. You can add more shelves for such as cucumber, strawberries, etc which don't require much height as they will lie flat on the mesh.
3. Place the mesh across each shelf and secure with strong ties, rope, wire or nail firmly onto gum pole frame; it must not sag or loosen and fall off.
4. Germinate or buy melon, (or okra, strawberry or seeds) or buy seedlings. Once they have two leaves or about 10cm, transplant into the containers or ask your nursery staff.
5. Now hold the container from the bottom of the mesh with the string, pull through the mesh and tie firmly onto the pig netting. In doing so, the seedling must be as close as possible to the pig netting and jut out onto the netting area; the container below and seedling above. You can space them about 20-50cm apart in the centre in a line. If mesh is wider (1.5mt), then have 2 rows opposite each other about 15cms from the edge. The next time you plant, you will know whether to increase or reduce plants.
6. The seedling plant will start spreading its branches on the mesh table as it grows; monitor and stretch them out over the netting. After flowering, the tiny water melons will form. Spread them so that they don't touch each other and are at least 40cm apart. Once that is done, don't move the fruit again.

Each plant will give you about 4 melons. Below is all the info you need to care for water melons. With 4 shelves, you should harvest about 50 water lemons. If you sell them you will recover the cost (and even more) of te structure!

7. Water melons require a lot of water, so keep checking every day. Once the fruit forms, less water but soil must remain moist!

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YOUR HANGING GARDEN - STOP ENVIRONMENTAL POLLUTION

Don't throw away your cool drink/water plastic bottles!
Set up your own hanging backyard garden

You will require: a soldering iron, enamel paint and brush with Turps to clean, cotton or hessian twine (2-3mm) and plastic string, like the ones they use on clothes or similar if available in different colours.

Step 1:
Paint the container completely with enamel paint; double coat better. PVA and aluminium tend to crack and peel. This is to prevent algae forming if exposed to sunlight.

Step 2:
(i) Use your soldering iron to burn holes where the red circles are, to allow the plastic string to go through. About 5-6mm x 2 on each side facing each other/in line. (ii) Depending on how high you need to hang, measure and double the length x 2. The plastic string must be thick enough to hold the weight of the container once filled with compost and soil. Cotton string will fray in time.

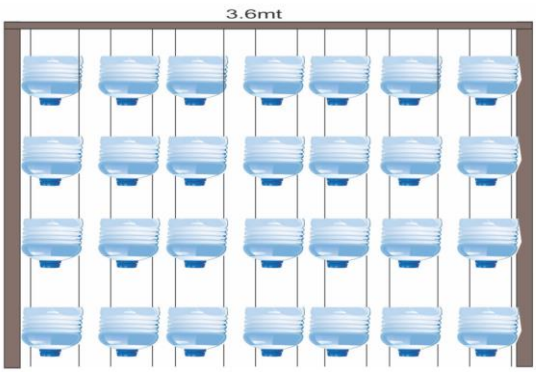
Step 3:
Make similar 2 holes on either side, facing each other on top; the blue circles. Thread your cotton string through. It should be sitting in the container like a U as one piece, Make a knot where you thread so that it does not slip through. This cotton string will draw the water up into the soil.

Step 4:
Make smaller holes (about 1-2mm at bottom) about 3 on each side. These are breathing holes and for excess water to drain out. The holes must be about 4-6cm above the base. What happens is that within this gap, is a water reservoir from which the string draws up the water!

Step 5:
Fill in your soil mixture (potting soil/compost mixed with garden soil 1 part to 2 soil).

Step 6:
Plant your seeds as instructions on packet and spray water with bottle.
Once you understand the principle and process, it is simple.

As for the different designs:
No. 1, you can plant deep rooted veggies, like carrots, tomatoes, swiss chard/spinach, etc.
No. 2, is same as No.1 for application
No. 3, short root veggies and herbs such as Coriander/dhania, parsley, strawberries, garlic, and roots such as ginger.
No.4, adapt with different plastics. Same principle



LEFT PIK: The containers can be hung on a metal or wooden U frame and knocked into the ground to hold it firmly. Or you can hang on your clothes line, fence, off the roof, walls, etc.

RIGHT PIK: If your yard is big, try this, with one first. Make sure the base is placed into concrete or else it will collapse with rain and/or wind. Here you can plant a variety or veggies and herbs, with different size containers, or if you want to resell, one variety (eg spinach, lettuce, cauliflower, etc). On one such unit, you can have 20-50 containers! You can put up more alongside about 60-90cms apart. Reinforce units by joining each with cross members on top end.

CHAPTER 23
TIPS AND IDEAS

You can adapt further on these ideas. Just do what makes you happy or fits into your plan!
Cotton strings may be placed inside the containers like wicks to draw up the water into the soil.

Vertical gardening against a wall or, free standing as in pic 4. The top of 5lt or 10lt plastic bottles. They can be cut longer/deeper as in 4. Increases production 4 times as much compared to being planted on ground

For outdoors, 2lt and 5lt plastic bottles on a metal stand. Can be wooden or bamboo. Water is filled in bottom tray, from which cotton string draws it up into the soil. No slugs, rodents, insects, flooding, etc. Knocked down into ground

Seems like indeterminate tomatoes

Improvised seedling tray from juice carton. Tomato

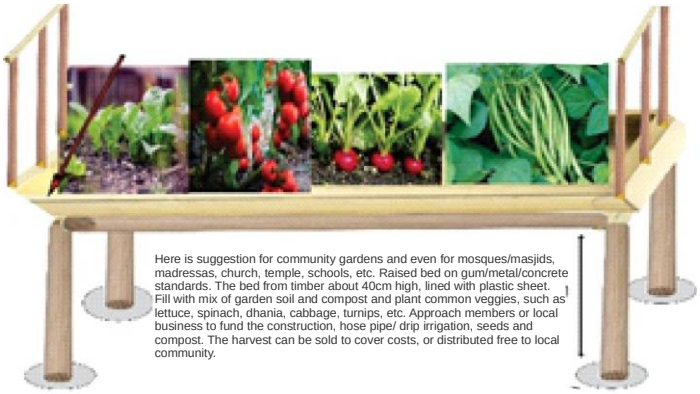
Do your bit against pollution...convert the plastic bottles into veggie genie in a bottle! Cut out these 2-3cm holes (use soldering iron or sharp pointed knife), and insert your garlic cloves in each...and watch it grow! Potting soil mixed with garden soil will do. Water twice a week

Another suggestion for plastic bottles; hanging garden!

This is what I have adapted from the Japanese. Water is filled into bottom section which is then drawn up by a cotton string via the cap into the soil. Cuts down on daily watering. See pic 4 below

Evaton, Jhb; elders were shown how to prepare their plastic bottle containers and given free seeds and compost. The project not only educates our people where it matters but also empowers them to be self-reliant, knowledgeable and role models to the community

Hanging garden with 5litre plastic bottles. If to be placed outside, enamel or spray paint first to prevent algae. The metal bar inverted U can be wider and higher (3mt x 2mt) to hang/increase the number of containers or range of veggies.



Here is suggestion for community gardens and even for mosques/masjids, madressas, church, temple, schools, etc. Raised bed on gum/metal/concrete standards. The bed from timber about 40cm high, lined with plastic sheet. Fill with mix of garden soil and compost and plant common veggies, such as lettuce, spinach, dhania, cabbage, turnips, etc. Approach members or local business to fund the construction, hose pipe/ drip irrigation, seeds and compost. The harvest can be sold to cover costs, or distributed free to local community.

This structure can be stepped up with 2 or 3 beds/tiers and covered with shade netting.
It's off the ground and fixed securely at the legs in cement so it doesn't collapse.
A box about 50cm depth is made and lined with the black 200 micron plastic sheet used by builders and placed on the table. Fill with soil/compost and plant. The plastic will prevent the wooden box from rotting. For sides of box, use pallet or wooden boards. The uprights at each end are to run string/wire across; trellis for tomatoes and climbers. Good enhancement for landscapes.

* Designed by Haji Hanif Manjoo

Here (above right #1is a commercial Grow Bag for potatoes, with slit to remove the potatoes and reuse the bag. It can also be used for sweet potatoes, yams and other root vegetables. On right is same concept, using the hessian 50kg animal feed bag. The trick is to plant layers of compost and garden soil, half way up. Throw in your potato seed about 5cm apart and cover with soil. You can ourchase seeding potatoes from your nursery/garden shop. Potatoes that have turned green can be cut up, separating the nodes, and planted. You do not need to buy the seeds; use the potato peels directly from your kitchen...yes, the thin peel! After about a week, you will notice the leaves popping up. Once they about 10-15cm im height, top up mixture of compost and soil. Do this the following week again, once the shoots are well above the new lot of soil. Once the leaves start wilting (about 3 months), cut a slit/window like the commercial one above. BUT, do this from bottom up; NOT TOP DOWN! This is to examine the bottom lot first, working upwards, if they are ready to collect! You should get between 20-30kgs if not more! Try your first batch. Thereafter, if you want some sideline income, get more of these bags, fill and plant. Remember to wash and sterilise the bag after each harvest!

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