

*countdown to*  
**PlantingSeason**

**Lessons 1-6**

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## Lesson 1: What is Organic?

Morning class! Today is your first lesson in organic farming.

Quiet please.

I'm very excited. We have a guest teacher today! His name is Thomas Linders. Thomas is a very special being. He also happens to be a leading authority in organic farming. He is just the man to get the ball rolling on this little adventure that we call Countdown to Planting Season.

You've all herd the term "organic," but what on Earth does it actually mean? It sounds simple, but the entire concept has become warped and twisted by... well, let's not go there today.

Hey... are you paying attention or must I send you to the headmaster's office... AGAIN??

**Now... Mr. Linders, why is there so much confusion around the term "*organic*"?**



Well, I guess Organic is a very broad term, and whenever this is the case people will take advantage of it. It's like the word "eco." At present anyone can label something organic, without needing to substantiate it. Unfortunately until now, there has been no legislation in South Africa that certifies organically grown food. For years we have been waiting for the Standards for Organic Agriculture to be acknowledged by the Minister of Agriculture and to be passed through Parliament.

At present you can only be sure that something is grown naturally without synthetic fertilisers, herbicides,

pesticides etc., if the product has a label from an organic certifying agency, like Ecocert/Afrisco and others, with a producers name and certifying number on it.

### **The certification process must be very difficult and expensive to manage. How do small organic farmers cope?**

With great difficulty. Luckily there are alternatives being developed to conventional certification, especially for small scale farmers, that cannot afford the expensive certification process. One of them is called PGS - the Participatory Guarantee System, which involves farmers, consumers and a regulatory party (the certifier) to work together intensely. A set of guidelines is worked out, based on international Organic Standards (e.g. IFOAM, the International Federation of Organic Agricultural Movements), to which the farmers will have to perform. The farms and market gardens are inspected on a yearly basis by a group that consists of fellow farmers in the group, interested consumers and the 'certifier' and assessed according to these guidelines. This system is cheaper, because the 'inspectors' are volunteers and chosen on a rotational basis from the pool of farmers and consumers and the certifier has only an overseeing role.

I know of such groups successfully working in Ghana, Uganda, Kwa Zulu Natal and the Organic Market in Bryanston, Johannesburg has also instituted such a system successfully.

### **Where did this confusion come from?**

We are in this quandary partly because we as consumers have become so alienated from the gardeners and the farmers who produce our food, that they can get away with anything. Very few people know what *really* goes on behind the scenes to bring food to our table.

If we could become more interested in how we feed ourselves and make conscious choices of where we source our food from (which would involve an active relationship with the food producers), we would not need certification. We could verify ourselves that the processes are natural and life supporting. A bit of navel gazing is possibly in order here for we spend more time in researching the next car, computer, toy purchase than what we ingest everyday. Our food is the basis of our health. The more nutritionally dense it is, the more it will support our health and well-being, the less we need to eat, the less we need to visit the doctor.

### **"Nutritionally Dense?" What does that mean?**

It is by now well documented that organically grown food is much more nutritionally dense, some nutrients are up to 20 times higher compared to chemically grown produce. An article in [www.medicalnewstoday.com](http://www.medicalnewstoday.com) (11 July 2004) comes to the conclusion that a predominantly organic diet:

- Reduces the amount of toxic chemicals ingested
- Totally avoids GMO'S (Genetically Modified Organisms)
- Reduces the amount of food additives and colourings
- Increases the amount of beneficial vitamins, minerals, EFA's (essential fatty acids) and antioxidants consumed
- Appears to have the potential to lower the incidence of common conditions such as cancer, coronary heart diseases, allergies and hyperactivity in children

## **Are you saying that in order to be truly "organic" you need to be more in tune with the actual person that grows your food?**

Absolutely! All over the world consumers have woken up to this fact and that has spawned a variety of modalities of farmer - consumer relationships. In my mind the most progressive are CSA's - Community Supported Agriculture, where a group of people come together and work out with their chosen local organic or biodynamic farmer, what his budget is for the year. The consumers will then divide this amount up into shares that they sell amongst themselves. This will ensure them a regular weekly supply of fresh produce and for the farmer money upfront, so he can concentrate on what he is best at - producing healthy nutritionally dense food. Additionally the consumers can get involved in special cultural activities on the farm and can help in times of intense workload, e.g. for the potato harvest.

The closest that I have seen in South Africa are the so-called box schemes, where the consumer takes out a subscription with a farmer/market gardener and gets delivered a box of produce on a weekly basis.

Of course the most intimate and assured way of putting fresh healthy produce on our tables, is if we grow it ourselves. We will make sure that we develop a healthy soil, which is the basis of our health, and not spray all kinds of synthetic chemicals for 'crop protection'.

## **Wait a second... are you saying that pesticides are not necessary?**

With correct farming methods, of course not. You see, here is the fundamental difference between organic and chemical farming - In chemical farming the soil is merely a means to support the crops grown and all nutrients are 'force-fed' into the plants through soluble salts (N,P,K and trace elements). Much research, especially by Francis Chaboussou, has shown that this is actually the cause of all pest and disease attacks. Because the plant is forced to take up the soluble salts and it takes a while to transform them into plant-own proteins, there is a window, where the plant suffers under 'indigestion', metabolic disturbance. This is a signal to pests and diseases that there is an organism that needs to be eliminated, as it has no place in a healthy, balanced environment, and they come to feed on the non-digested nutrients. Chaboussou coined the phrase 'A pest starves on a healthy plant'!

It is exactly the same with the human body. A healthy body resists infection... and so do plants!

In organic farming the soil is the centre of attention, for not only is it the substrate that holds the plants, it is also the source of all its nutrition.

We as organic growers have a great teacher in 'Mother Nature', who has arguably 3.8 billion years of R&D behind her in working out the best systems for supporting life on this planet. The answers to all our questions are found in studying intimately the relationships in nature. A great teacher of mine, Victor Schauburger, expressed it so: 'Comprehend Nature and then copy it' - we don't have to add anything, because we think we are clever, just copy it! I guess this is the basis of the great 'new science' of biomimicry.

## **Many farmers argue that they need chemicals to increase crop yields. Is this true?**

Only if the wrong processes are used and you want to impose your will on nature. If the right processes are used, then you can grow as nature intended. It is easier to implement this on a smaller scale which is why home or community gardens are so important.

All agriculture a 150 years ago was organic, supporting all agrarian cultures and, as we more and more discover through archaeological investigations, in many cases farmers had yields of up to 6 times of that which a chemical farmer expects on average (Sumerian agriculture, chinampa farming in South America, etc.) So, it is common sense and the healthy direction we should all take to look at what was successful in the past, combine it with modern investigations into nature and therefore grow organic!

**And there are health reasons, of course...**

I have read a paper that researched the involuntary consumption of agro-chemicals of British consumers, which concludes that it is estimated that the average British consumer eats with his vegetables and fruits around 5 kg of pesticides, herbicides and fungicides per year; still on top of that is the hormonal overload from animal food sources. This should make you think, then act!

Happy growing!

*More to come next week...*

*In the mean time, Thomas can be contacted via Midgard here:*  
<http://fs2.majesticinteractive.co.za/bf.php?fid=36&ref=PS>

## Lesson 2: Composting

Good morning class. And I must say, well done for getting your homework in on time this morning! I know it's the first time this year, but it's a start!

It's wonderful to watch hundreds of newcomers join every day. Just take a look at our home page to see how many people have put a live Planting Season countdown on their website - WOW!!!

Now, you all know about Facebook? So your homework for tonight is to join the Planting Season group at <http://www.facebook.com/home.php#/group.php?gid=99060727016> and invite your friends.

Right everyone, now let's all welcome today's very important guest, Gaby Leone. Gaby is an expert in indigenous landscaping and eco-gardening techniques. Today she is going to teach us about compost.

No, little Johnny, compost is NOT yucky! You have been brainwashed into believing that compost is yucky by the multinational conglomerates who use covert manipulation strategies to subjugate us into living dependent, subservient lives instead of allowing us to reach the natural, self sufficient potential that we all possess.

Now, welcome Gaby! Let's talk compost.

**Please begin by telling us how we should till the soil so that the compost can mix properly...**



Contrary to popular belief, there are no pixie gardening teams armed with spades that come out at night to dig over the soil around plants in nature. Why on earth did we get into that habit in our gardens? Digging over the soil literally turns the habitats of beneficial soil micro-organisms upside down and leaves a new section of soil exposed to the elements. If you mulch, your soil will be kept naturally well-drained, soft and fed.

The hardest part of this will be to persuade your gardener that he no longer needs to get stuck into the beds with that dreaded fork because to him, loosened and dug over beds show you that he hasn't been snoozing in the garden shed all day. Patience! Persuade him to use the extra time to build and maintain a compost heap for you instead.

### **What exactly is compost?**

Compost is pure organic soil food without added chemicals whatsoever. It consists of a variety of decomposed rock, plant and animal matter which is important to healthy soil and a healthy soil means a healthy plant. Compost is to plants what a balanced diet is to us. Our plants will grow without it, but they will feel much like we would on a diet of bread and water.

It makes no sense – if you think about it – to pay to throw away our organic waste and then buy it again in the form of compost. Make your own! At least you know what's in it! Besides feeding the plants, compost is the number one soil miracle cure. Use it to improve drainage in clay soil and improve water - holding capacity in sandy soil. Here's how – the lazy way.

### **Is it yucky?**

Most people don't like compost because the thought of having a rubbish dump in your backyard puts them off. In fact, a proper compost heap ADDS to the fresh smell of your garden, it attracts more bird life and saves a fortune on buying chemicals that can only harm you in the long run.

Compost heaps are usually kept in a corner of the garden furthest away from the house owing to their unsightliness. If possible, keep them at least 5m away from doors and windows. If you need the heap to look neat or to hide it from view, erect a fence about 1m high around it.

Compost heaps usually don't smell and if yours does, it is a sign that it is too wet and lacking in oxygen. Add more dry material such as leaves and shredded newspaper and turn it once every few weeks for aeration.

### **How do you go about starting one?**

Designate a semi-shade to shady area in your garden about 1 – 2m square depending on the size of your garden and the size of your family. Leave one side open for access with a wheelbarrow. Now start using this as your rubbish bin for:

- All dead plant material from the garden including lawn clippings and weeds,
- Fruit peels (remember to put some on the bird table!),
- Vegetable peels and waste material
- Coffee grinds and filters, tea bags and contents, egg shells, ash from the fire grate and shredded newspaper. Easy!
- Weeds and lawn clippings can be included because the temperatures generated in the heap in the decomposition process are high enough to destroy most weed or lawn seeds before they can come wreak havoc in your flower beds

Not suitable for compost heaps are: cooked food of any kind, meat and anthracite ash. If the compost heap is built well, citrus peel can be useful and dairy waste will also decompose (but may attract rodents). Any carbohydrates such as cooked rice, potatoes, pasta, bread, crackers, barley etc go onto the bird table provided they have not been smothered in sauces or spices.



### **How do you keep birds and creepy crawlies from coming into your house?**

Compost heaps develop quite high internal temperatures during the decomposing process, so in general, they don't attract creepy crawlies to the degree that it becomes a problem. If you want to steer clear of rodents, rather keep those fruit peels and pits aside for the worm bin.

### **What if you just want to buy a compost – any recommendations?**

If you're going to buy your compost – which may be necessary for the first season until your heap has gotten going, make sure that its ingredients are as natural as possible. 'Earth to Earth' compost bags are a good start.

For those of you interested in the packet jargon we will discuss under fertilizers, the earthworm castings (retailing as Fertilis) are classified as a 2:2:1 slow release fertilizer. The staff of my herb grower call them black gold and I would not plant one of my gardens without adding some to the soil.

### **How often should you compost?**

Unfortunately, our traditional gardening methods of digging over and raking the soil leaves it depleted, making regular composting a necessity.

Water your heap about once a week to speed up the decomposition process and after about 6 months, you should be able to start using the compost from the bottom of the heap. It's ready when it's black and sweet-smelling. If you'd like speedier results, grow some comfrey or borage and add the leaves regularly as compost activators.

To use your compost, apply it to your soil about twice a year: Spread it 5cm thick on top of your soil, dig in ever so slightly and replace the mulch over that. When you introduce new plants to the soil, plant them into a mixture of one part compost and two parts soil.

### **How does compost differ to fertilizer?**

I always like to compare plant care with 'human care'. A plant in poor soil feels like you would feel on a diet of dry bread and water. Add mulch and compost and we're talking a balanced diet, leaving you feeling far better as do plants and they show it! Organic fertilizer to plants is what added vitamins and

minerals are to us – we feel and therefore look and perform at our best. If the diet of compost and soil quality is extremely good, then fertilizer becomes unnecessary. However, in reality this is very difficult to do and it is recommended that you use an organic fertilizer for the first year or two, especially if you grow in pots.

Never use anything other than organic fertilizer because artificial fertilizers help plants extract nutrients from the soil, but do not enrich it. Your soil will therefore be in bad condition after a few seasons. I personally like to use a mix of half Talborne organic granular fertilizer (2:3:2 or 3:1:5 depending on the season) and half organic earthworm castings (2:2:1 (SR)) which you can either make yourself by means of a worm farm or buy in Fertilis bags – more about that later in this article.

Organic fertilizers are environmentally friendly, don't burn the plants or leave harmful residues in the soil. Here's a quick guide to the mysterious jargon on the packet:

- The three numbers on the packet (eg 3:1:5) refer to in order from left to right the portion of food available for specifically leaves and shoots (nitrogen), stems and roots (phosphorous), flowers and fruit (potassium)
- SR means slow release so the fertilizer dissolves slowly, releasing the nutrients to the plant in a steady, manageable stream over an extended period of time.

Fertilize every 4 months at the rate of one cup per square metre with an extra dose within the drip line for trees and shrubs. Use 3:1:5 in spring to encourage fruiting and flowering and in autumn and winter use 2:3:2 as this is the time when plants focus on strengthening their root systems.

### **Those that don't have gardens can use pots. Is this a good idea?**

Yes, but an important note on pots: Please don't condemn your plants to a slow death by confining them to pots with little space for soil and no fertilizer!! I see this happening so often. In a pot, the roots of a plant have no way of finding more food once that in their immediate vicinity is used up. Plants in pots need fertilizer about every 6 to 12 weeks depending on the size of the plant compared to the pot and they should be re-potted into new potting soil and often a larger pot once a year.

### **And if you have NO garden, what can you do?**

If you live in a flat, either buy a small sealable composting unit available from gardening shops or start a worm farm instead. Scott assures me that an article dedicated to indoor planting is coming soon.

### **You mentioned earthworms a few times...**

If you're going to make your own compost, you may as well add another ice-cream tub to your kitchen counter décor (next to the tub for the compost heap) – marked worm bin! to make your own fertilizer. The beauty of a worm bin is that it provides a way for you to recycle cooked food which is, as you hopefully remember, not suitable for the compost heap. Your earth worms will happily eat their way through your mouldy bread, refrigerator leftovers and even last night's pizza – they consume up to their own body weight in one day!

What you have coming out the other end are their castings and urine – the latter referred to as compost tea in polite company. (Now don't start your "yucky" business again - if I told you what was in your own body you would be even more grossed out!) The 'compost tea,' when diluted with water, is an excellent liquid fertilizer and the castings are a concentrated form of plant food. This plant food has many benefits and does not contain weed seeds, is naturally ph balanced, contains natural vitamins and minerals, improves soil water-holding capacity and soil structure and is more plant-ready than ordinary compost or fertilizer. The castings have the consistency, smell and colour of very fine potting soil – not at all unpleasant to work with.

If you'd like more information on worm bins or would like to obtain one, get in touch with me. I sell a good-sized tray system for R850 including 250g worms and instruction booklet. If you live in a flat, chances are that you will have more kitchen waste than plant waste and your worms will eat your cooked food leftovers not suitable for the compost heap as well. The castings provide excellent pot plant fertilizer and the worm tea a perfect foliar feed spray.

Soil enriched with earthworm castings is more likely to attract other earthworms back into your garden. These will then produce their own castings and thus fertilize your soil on the spot. Remember to give them plenty to munch on by mulching your soil.

### **"Mulching" - is that a rugby term?**

Have you ever wondered how plants manage to thrive and flower in the wild where there is no water and fertilizing regime or loosening and clearing of the soil? It's incredible how nature takes care of itself, but it's actually very simple – think about it: every leaf, twig or withered piece of plant material stays exactly where it has fallen, undisturbed - except by possibly a gust of wind - eventually forming a blanket on the soil surface which we call mulch. This blanket keeps the good in and the bad out:

- It regulates soil temperature, protecting plant roots from extremely hot summer sun and winter cold and frost
- It stabilizes the soil, preventing soil erosion caused by rain
- It keeps the sun from leaching out soil nutrients
- It keeps moisture in the soil by decreasing evaporation
- It enriches the soil because as it breaks down, it turns to compost
- It provides food for earthworms who draw it into the soil through their digestive processes providing the plants with what is arguably the best natural fertilizer around
- It stops weeds from growing by depriving them both of space and sunlight

There are two broad categories of mulch: the kind that breaks down into the soil - eventually feeding it - such as plant material or newspaper and then the permanent although sterile kind – sand or pebbles. I like the idea of everything having a dual purpose – I get the feeling it runs in the family... I caught my daughter using her upside down riding hat as soup bowl holder the other day...Sooo – I'll elaborate on decomposing mulching which can be bark chips, pine needles (for plants that like acid soil!), partially decomposed compost, fallen leaves or shredded newspaper. Be careful using lawn clippings because the decomposition process takes a lot of nitrogen out of the soil, and the accompanying heat buildup may burn the plants. Rather mix the clippings with other plant material.

That's the good news – you don't need to dig your compost into the soil anymore! Spread the mulch onto the soil in a layer between 5cm to 10cm thick. The coarser the material, the thicker the layer can be. Leave a hand's breadth area open around the base of trees and shrubs (because mulch touching the stems may cause fungal diseases) and let the earth-worms get to work while you sip your well-deserved sundowner on the patio.

For more information on how to make your own compost, take a look at these two clips:

- [http://www.youtube.com/watch?v=ySW\\_ZA5yrfU](http://www.youtube.com/watch?v=ySW_ZA5yrfU) – Good basic compost making visuals and info
- <http://www.youtube.com/watch?v=IFsSIS7IHBg&feature=fvw> – How to prepare the beds using ready-made compost and also via a method called sheet mulching – making compost in situ so to speak – preparing the beds the lazy way

If you've enjoyed this article and would like to know more about eco-friendly gardening with indigenous plants and permaculture food gardens, email me at [gaby@gabyleone.co.za](mailto:gaby@gabyleone.co.za). I design, install and seasonally maintain permaculture veggie patches for those not confident to do it alone. For info on

permaculture food gardens in Johannesburg, visit [www.siyakhana.org](http://www.siyakhana.org) and for all matters green try [www.urbansprout.co.za](http://www.urbansprout.co.za).

*Thank you Gaby! More from the experts coming soon.*

*Scotty and the Planting Season Team*

### Lesson 3: Choosing the Right Seeds

Good morning my favourite class of growers-that-will-change-the-world!

I am so very excited today because we have an OFFICIAL ANTHEM for Planting Season! I first heard this song when I was 12 and it has stuck with me ever since. The lyrics have more relevance to South Africa today than they did 20 years ago. To download the song, please click <http://plantingseason.majesticinteractive.co.za/bf.php?fid=7>. All I can say is... *here come the Rainbow People!*

Your homework for tonight is to speak to the media about this initiative. Play the anthem in the office and send it to your favourite radio station! Convey your feelings about Planting Season to magazines, newspapers and TV channels. Government officials and large corporations will never really action sustainability projects unless we, the people, motivate it.

Let's begin today's lesson on *choosing the right seeds*...

Before we start planting, a knowledge of the various seed types is important. Right now, the Rolls Royce of seeds, "Certified Organic" are both difficult to find and very expensive. One of the primary goals of *Planting Season* is to increase demand for good quality seeds. Don't listen to the economics text books! If we increase the demand for organic seeds, then the price will come DOWN. Organic (or close to organic) seeds are available locally (albeit sporadically), but already seed growers are preparing to supply a wide variety of high quality seeds at much lower prices. They just need someone to sell to!

To create demand, go to your nursery and ask for organic seeds. If they don't have certified organic, then ask them for the closest they have to what nature intended. If they try to bamboozle you with rubbish about pests and the importance of chemical fertilizers, say "no thank you!" For a small backyard garden or indoor planter, you do not need to destroy your soil with chemicals. Remember, pests are very reluctant to attack healthy plants that are cared for and loved (just like us!)

An understanding of seeds is so important that I'm going to waffle on a bit here before I bring in our resident expert. It is believed that because of global monoculture (the growing of the same farm crop over and over again in the same soil) coupled with the desire to maximise yields, around two thirds of the worlds variety of seeds have all but vanished. Around the world right now a few organisations are painstakingly preserving some of the most magnificent species of plants you can imagine. They are waiting for it to become feasible to release them back to the world. In other words, they are waiting for us.

Search Google for the *Doubleday Association (HDRA)* or take a look at:

<http://news.nationalgeographic.com/news/2008/02/photogalleries/seedvault-pictures/photo6.html>  
[http://en.wikipedia.org/wiki/Svalbard\\_Global\\_Seed\\_Vault](http://en.wikipedia.org/wiki/Svalbard_Global_Seed_Vault)

How can you and I increase the demand and proliferation of seeds right now? Through KNOWLEDGE. And that is why today's special guest is Simon Hodgson. Simon is a seed fanatic. I know he's a seed fanatic because I spoke to him on the phone for an hour and hardly got a word in. This man just loves seeds. Maybe that's why he has 12 children? (Just kidding).

**Simon, before you choose a seed, what do you need to do?**



You first need to ensure that you have the basics correct. All of these points, I believe, will be covered in later lessons? Before we choose seeds, we need to make sure that:

- Our soil is prepared and ready to go,
- We have a nutrition and organic spray program formulated for the plants we are going to plant,
- We know what crop we are going to plant and when,
- We know how long it will take to grow until we can harvest and eat it,
- We have a rotation plan as well as a green manuring and composting procedure in place

**So how do we choose the right seed?**

In South Africa we generally have Open Pollinated varieties and Hybrid varieties available to us. These are available in the form of seed and seedlings from any number of outlets such as Supermarkets, DIY shops, Garden Supply Stores as well as Nurseries and Landscaping Outlets.

**What is the difference in the types of seed available?**

**OPEN POLLINATED SEEDS**

Open Pollinated Varieties or OP varieties. These are plants, which when left to produce their own seed, will produce a seed, which when allowed to germinate, will have the same characteristics as the parent plant from which it originated. (So if you want to keep your own seed, once you have produced a crop, this is the type of seed you need to plant.) All traditional heirloom varieties, which have stood the test of time and give reliable yields, are open pollinated seeds. Heirloom Varieties also ensure that we have a wide genetic spectrum of vegetables and varieties to choose from.

## HYBRID SEEDS

Hybrid seeds are the first generation (F1) offspring of two distant and distinct parent lines of the same species. Hybrids are developed for disease tolerance, size, speed of growth, taste – in fact for any reason which may be considered desirable. Because they are a cross and need both a male and female parent, the seed produced by hybrids will not necessarily produce a plant similar to itself, as an OP would. Seeds taken from a hybrid may either be sterile or more commonly fail to breed true – that is, not exhibiting the desired traits of the F1 generation. Most seed producing companies have breeding and production programs to continually try to improve these varieties, and more importantly maintain the desired traits of the hybrid.

As a result of the processes involved with producing hybrid seed and the time and money spent on developing these hybrids, (a lot of them are hand pollinated) - the seed generally tends to be more expensive and aimed at the commercial grower as opposed to the household organic gardener. As a rule of thumb, commercial nurseries use hybrid varieties of vegetables, as opposed to open pollinated varieties.

Hybrids should not be mistakenly called GMO's or genetically modified organisms, which are any organism which has been genetically altered using molecular genetics techniques such as gene cloning or protein engineering.

### **What about Organic Seeds?**

Other types of seed which are available are Organic Seeds and seeds which are commonly termed Heirloom Seeds. In South Africa Organic seed production is in its infancy. Organic seeds are self explanatory in that they are produced under certified organic growing conditions, i.e. without the aid of pesticides and herbicides.

Heirloom seeds are generally considered to be seeds from open pollinated varieties which are 50 years old or older. These open pollinated varieties have kept their characteristics over time, they are no different to standard OP's but are just older varieties.

### **How do you go about choosing which seeds to get?**

When making a decision what type of seed to plant – either a hybrid or an OP an organic or an heirloom variety – decide what you want from it. If you want to keep your own seed, then grow an OP, if the crop will never have a chance to set seed then you may consider a hybrid. In South Africa the bulk of commercially produced vegetables are hybrids.

For example, if the crop is one such as Cabbage, Cauliflower or Broccoli - where we eat the developing flower of the plant and the plant doesn't have a chance to fully develop its flower and set seed, then a hybrid variety with increased disease tolerances may be considered, or on the other hand, if the crop is something like a pumpkin or gem squash or butternut squash, where the seed is fully developed in the fruit – an OP may be used, as the seed can be hollowed out and saved.

Both OP and Hybrid varieties can be grown organically – ask your seed seller or your nurseryman and they will be able to tell you which varieties are open pollinated and which ones are hybrids, you can then make an informed choice. Seeds may be selected according to individual needs and wants – either open pollinated, hybrid or organically produced. When growing those seeds, ensure that soil health is maximised, as a healthy, working soil will help reduce the incidence of plant pathogenic organisms.

### **If a seed has been modified using natural selection, is this a bad thing?**

Natural selection is just that – no man made interference. If a seed has a characteristic bred into it, it is usually a hybrid. All open pollinated seeded varieties have been as a result of natural selection, or the age old adage of “survival of the fittest.” Here nature ensures that the dominant genes survive for the furtherance of the species or variety. If a seed has been modified in any way by human input then natural selection falls away from the cultivar.

What does happen with OP varieties is that we as humans observe the desirable traits as they occur and then select those particular plants to continue that cultivar. For example – we came across one passion fruit plant that produced multiple flowers, and as a result potentially multiple fruits at each leaf axil instead of only one flower, and one fruit. Instead of harvesting the fruit we kept them to take seed from, to ensure we could get this trait in the next planting, to increase yields. A simple way in which desirable characteristics are passed on by selection and nothing else. We did not modify the seed – nature did that. We did select it though - because of its characteristics. This is how OP varieties adapt themselves, and we take advantage of it.

Happy growing!!

Thank you Simon!!

Under biodynamic principles (the purest of all growing methods), you should not plant anything but the purest seeds. Seeds that have been altered by man in any way cannot be used and, under this method, they are planted and harvested according to celestial cycles. Please avoid using genetically modified seeds at all costs. Ask for the most natural wherever you go because we need to increase demand for good quality seeds and therefore good quality produce!

## Lesson 4: Organic Food and Your Health

Thank you for the apple today! And I see it's an organic apple too. :) You really know how to brighten your teacher's day.

Before we begin today's lesson, let me quickly make you smile. Take a look at the bottom of the [www.plantingseason.co.za](http://www.plantingseason.co.za) home page. You'll see a random quote by an ordinary person speaking about why growing our own organic food is so important. Keep refreshing the page for more smiles. Our goal is to publish 10,000 of these comments in a book and hand it to President Zuma live on national television. Now, how's THAT for an idea!!!

Very few people understand the true ramifications of eating organic food. It has been proven beyond any doubt that the nutritional density is far higher than ordinary eating. The reason for this is that the soil used for growing organically (or as naturally as possible) is of a much higher quality. Plants are like us - they are what they eat, so a healthy soil means a healthy plant.

Your own plants even get to "know you." This may sound like new age airy-fairy namby-pamby "oh dear, here come the tree huggers" riff-raff trollop, but here is an example. It is scientifically shown that water has memory. The molecular structure of water is shaped by human emotion and because plants absorb the water that you provide them, the water within the plants actually takes on a similar molecular shape to the water found in *you*. This means your plants will produce the type and quantity of nutrients specifically formulated to *your personal needs*. Oh dear, here come the men in white coats to lock me up!!

Before they take me away to join various members of parliament, I need to mention that the effect of growing your own food is psychological as well as physical. This is something that we need to appreciate. Let's hear more about the effect of organic food on our health from our expert today, Lynne Brown. Lynne is from [www.orchardsnutrition.co.za](http://www.orchardsnutrition.co.za).

**Why is growing your own food healthier than buying it from the supermarket?**



Well the whole idea of eating fresh fruit and vegetables is to get essential nutrients that our bodies require for optimum health and nutrition. Growing your own vegetables means being able to eat as you pick, thus ensuring that you are deriving maximum benefit from these nutrient-packed powerhouses. And you also know the exact history of the vegetables you've grown.

Buying from the supermarket, on the other hand, leaves a big question mark as to how much goodness you're actually taking in and how much bad stuff is going into your body at the same time. These vegetables are often picked and stored before they ripen and then get transported over large distances, sometimes even imported from other countries. Then they may lie on the supermarket shelves under fluorescent lights for a couple of days, all this time losing precious nutrients. Chances are they have been grown in mineral-depleted soils using petrochemical fertilizers and pesticides and now - lucky us - we can even add genetically engineered foods to the list of possibilities. The intensification of farming practices over the last 60 years has really depleted the soil and resulting crops of nutrients, especially trace minerals. This is because the crops removed from the soil contain a wider variety of nutrients than farmers typically put back into the soil in the form of chemical fertilizers. So food - fruits, vegetables and grains - being raised on millions of acres of land that no longer contain enough of needed minerals, are starving us of the nutrients we need for optimum health, no matter how much of them we eat.

There are also the far more serious consequences of profit-hungry farmers trying to get a maximized crop yield by indiscriminately applying nitrogen fertilizers which then contaminate our water supply with nitrates. Acute exposure to nitrate-contaminated water can lead to "blue baby syndrome" in infants, which can be potentially fatal, and has also been linked more recently to increased risk of gastric cancer in Spain, China and Taiwan.<sup>1</sup>

So when it comes to health, growing our own foods and growing them organically is really non-negotiable.

### **What dangers do pesticides pose to our health and can't they just be washed off anyway?**

No, they cannot just be washed off and therein lies the problem. Washing produce with water has little effect on these residues as many are formulated to resist being washed off by rain or sprinklers. Tests with potatoes, apples and broccoli showed that between 50 and 93 per cent of pesticide residues, never meant for human consumption, remained on the produce after washing with water.<sup>2</sup> Some apples are sprayed up to 16 times with about 36 different chemicals before they reach the supermarket shelves and are also often coated with a wax, once again a petrochemical which was never meant to go into our bodies. Although peeling may help, to some extent, to remove surface residues, it won't get rid of the systemic pesticides that have been taken up in the flesh of the apple.

As regards dangers, remember that if chemicals have been sprayed on the foods you eat, then those chemicals will enter your body cells and bloodstream. These chemicals become toxins in our bodies, polluting and poisoning us and since many are fat-soluble, pesticides can be stored in our body's fatty tissues for years. The hazards include possible increased risks of cancer, infertility, allergies, neurological damage and immune system depression.<sup>3,4</sup> So anybody with any type of cancer or a neurological disease such as Parkinsons or Multiple Sclerosis, would do well to go organic. Many pesticides are known animal and suspected human carcinogens. Canadian farmers with high exposures to pesticides have been found to have higher incidences of cancer, including stomach, prostate, brain and skin.<sup>5</sup>

Pesticides are also believed to have hormone disrupting effects. Many pesticide compounds have oestrogenic properties, and are classed as xeno(foreign)-oestrogens. The Institute for Optimum Nutrition advises that women with symptoms of hormonal imbalance such as PMT and menstrual irregularities should avoid non-organically grown food to reduce their exposure to xeno-oestrogenic pesticide residues.<sup>6</sup>

Research has also suggested that pesticide exposure affects male reproductive function, resulting in decreased fertilising ability of the sperm and reduced fertilisation rates.<sup>7</sup> Conversely studies have shown that sperm concentration can be 43% higher among men eating organically produced foods.<sup>8</sup>

The herbicide glyphosate (Roundup) has been shown to be capable of disrupting hormone synthesis in male mice.<sup>9</sup> In humans, research has supported the hypothesis that exposure in pregnancy to environmental xenoestrogens can affect the human male offspring's reproductive system and there has been an increase of genital abnormalities such as undescended testes, which it is thought could be due to an environmental effect on the developing male foetus.<sup>10</sup>

### **Do organic foods contain more health-giving nutrients?**

Although some studies have concluded that there is no difference between the nutrient content of organic compared to inorganic produce, I'm afraid I cannot go along with that. When it comes to combining nutrients that work together synergistically to give optimum nutrition, Nature knows best. Fiddling with the soils composition is going to result in an imbalanced ratio of nutrients in the vegetables growing in that soil, which can then have an effect on the composition of minerals and vitamins that we absorb. We already know that what cow's are fed has a big influence on milk quality. A study by Newcastle University has shown that organic milk is significantly richer in nutrients than that from conventional dairy farms.<sup>11</sup> Researchers found that when cows were grazed outside on grass and clover, they produced milk with higher levels of essential fatty acids, antioxidants and vitamins. More specifically they found that organic milk has 39% more omega-3 fatty acid and 33% more vitamin E than the non-organic alternative.

A lot of other research has been done comparing the nutrient contents of organic and non-organic fruit and vegetables and the majority reveal a trend towards higher levels in organic products. For example a 10 year study done in Kenya on tomatoes that looked at two particular flavonoids, quercetin and kaempferol, found they were on average 79% and 97% higher respectively in organic tomatoes than conventional ones.<sup>12</sup>

Anyone wishing to know about other studies done can find these on the Soil Association website. Health claims for organically grown food can be traced back to the early 20th century, most notably Lady Eve Balfour, a pioneer of the British organic movement, who in the 1940s observed relationships which she described simply as "Healthy soil, healthy plants, healthy people."

### **We hear so much about phytonutrients these days. What are they?**

These are natural bioactive compounds, also sometimes called phytochemicals, that are found in fruit and vegetables. They are produced by plants to protect themselves against attack, disease and damage, so if a plant is subjected to higher levels of stress it will accumulate higher levels of phytonutrients. In the case of organic produce where chemicals such as insecticides and fungicides are avoided, a greater reliance on the plant's own natural protection systems will result in the accumulation of higher levels of these protective compounds.

### **Which key fruits and vegetables are the healthiest and in what way do they benefit our health?**

Well I have to say that would be those that contain the highest levels of phytonutrients because it is believed that in the same way that the plant accumulates phytonutrients to protect itself against disease, these phytonutrients will protect our bodies against disease when we consume enough of them.

In the treatment of cancer, phytonutrients have been identified in the literature as having beneficial effects through various mechanisms, including neutralising free radicals, inhibiting metastasis and stimulating the anti-tumour activities of the immune system. Cabbage, broccoli, cauliflower and Brussel sprouts contain isothiocyanates, the best proven cancer preventing phytonutrient in vegetables. Research has shown that broccoli in particular has plenty of this cancer-fighting nutrient and men should really be eating 10 spears a week to reduce their risk of developing prostate cancer.

Then there are the brightly coloured fruits and vegetables containing high concentrations of another class of phytonutrients called flavonoids. Flavonoids have been shown to be powerful antioxidants, are anti-inflammatory, anti-allergenic, anti-atherosclerotic and can discourage the growth of established tumors.

Generally the rule of thumb is: if the fruits or vegetables stain your fingers then they're high in anthocyanins. This is a type of flavonoid identified as having the highest antioxidant activity of any plant foods and the reason why blueberries, strawberries and beetroot are extremely good for you. In dark green leafy and red or yellow vegetables we find carotenoids in high concentrations, This is another cancer-fighting phytochemical and there has been much research around the prostate cancer fighting properties of lycopene, the carotenoid found in tomatoes. Men should be eating lots of tomatoes which, apparently need to be cooked in oil rather than eaten raw to gain the maximum health benefits of lycopene.

Then there are the sulphur compounds found in garlic, onions, cauliflower, cabbage and broccoli that are great anti-inflammatories, aid detoxification, heavy metal removal and cardiovascular protection. They also help to repair cartilage so I recommend them to my arthritic patients.

In fact Hippocrates was so right when he said as far back as 390BC, "Let food be your medicine and your medicine be your food." As nutritional therapists, we use foods and wholefood organic supplements all the time to assist people with problematic health conditions. Good organic foods can replace harmful drugs in many disease conditions with great success. Regular consumption of garlic and onion has been shown to significantly reduce the risk of heart disease and the spread of cancer.

I call all these foods "power foods" and one should have at least 5-7 servings chosen from the foods every day. In general, if your plate of food is filled with a variety of colourful vegetables and fruits you can be sure you've got most of the important nutrients covered.

### **Would you say that just the act of growing your food organically could have a psychological impact on one's health.**

Well if I think of the impact it has on myself I would have to say a most definite yes. Gardening on its own is one of the most therapeutic exercises one can indulge in, however gardening with the knowledge that you are doing all the right things for the soil and the environment and not harming future generations is especially rewarding. Making ones own compost, recycling and putting back into the earth what you have removed previously, returning beneficial microorganisms that constantly improve the health of the soil, not having to touch or breathe in harmful chemicals, feeding your family nutrient-rich fresh and flavoursome produce taken straight out of your own garden, is therapy indeed.

### **Would you advise parents to feed their children organic foods?**

Children need organic foods even more than adults. Because they have a higher intake of food and water per unit of body weight than adults, have immature organ systems, and may have a limited ability to detoxify these substances, they are more susceptible to pesticide residues than adults.

Pregnant and nursing women should also be strictly on an organic diet. In 1975 French researchers found that mother's milk contained two to eight times more chlorinated pesticides than the World Health Organisation's (WHO) maximum tolerated level in foodstuffs, and when the mothers under investigation increased their intake of organically grown foods the concentration of residues in their milk declined. 13

Thank you Lynne! The giant food corporations are doing a fantastic job of making us *think* that non organic produce is just as good as organic. How long can they keep this charade going? Well, that's up to you, me and the other 999,998 South Africans who need to plant their own vegetables to find out.

## Lesson 5: Genetically Modified Foods

Hello! Goodness gracious don't you look bright and cheery this morning! Have you been using that organic shampoo and moisturiser I gave you? I thought so.

*Now tell me, will the Countdown to Planting Season ever reach a million people?*

This is an important question. Although we have 10748 people and 251 businesses ready to plant on September 22nd, this number does not take into account a few special groups:

1. Firstly, the awesome community work that is being done by NGO's and volunteer groups. They will be planting along side us and their projects will involve tens of thousands of people.
2. Nor does the current figure take into account employees of participating companies that will be planting, thanks mainly to the sponsorship of their bosses.
3. And finally there are the schools and churches that are coming on board. Thousands of students and underprivileged people will be added to the countdown from these organisations.

As we approach the 22nd, we will get a more accurate figure of just how many people will *actually* plant on September 22nd. In the mean time, if you want to be informed when key milestones are reached, please join our Facebook group at <http://www.facebook.com/home.php#/group.php?gid=99060727016&ref=ts>.

Now for some bad news. Alas, Planting Season can't always be about positive, uplifting, hippie, let's-all-sing-John-Denver-by-the-campfire-and-skinny-dip-under-the-full-moon stuff. When I learned the truth about how the global corporations are trying (and succeeding) to control our food supply, it effected me deeply. In fact, this is the main reason why I put so much into this initiative.

Put simply, **growing our own food is the first and only step toward a sustainable Earth.** Never underestimate the power of what you are doing here Scott. This is the real deal.

Right, here's the story of Genetically Modified foods as I have researched it.

### What are GMO's?

Genetics are the software that determine how living things grow. It is the blueprint for our existence and, as such, it is almost as complicated as we are.

We have two strands of DNA. These strands come together in the middle like rungs of a ladder to create a sequence of what are called base pairs. There are about 3 billion base pairs in the human body. A group of these base pairs is a gene - some contain a few dozen base pairs, some a few hundred. There are about 60,000 genes in the human body - some are turned on and some off and nobody has the faintest idea what most of them actually do.

We do know that each gene within a living organism has a specific function. So, when a scientist discovers which gene in a glow worm is responsible for making it glow, they can then "splice" (or merge) this gene into that of a goldfish. The result - a goldfish that glows in the dark. If you think I'm joking, feel free to buy one right now at [www.glofish.com](http://www.glofish.com).

## So, what's the problem?

Genes (like everything in life) are interconnected. As soon as you manipulate one gene, research has shown that other genes around it start to switch themselves on or off in attempt to compensate. Nobody knows what effect this new combination will have and, as far as Monsanto and other GM food companies go, they don't seem to care. I'll go into this in more detail later, but a documentary called *The World According to Monsanto* aired on French TV and very quickly gave the country's citizens a wake up call. You can watch it here:

<http://video.google.com/videosearch?q=The+World+According+to+Monsanto&emb=0&aq=-1&oq=#>.

Genetic modification is a bit like putting blinkers on a horse that's spent its whole life with his eyes wide open. Suddenly the blinkers go on and the horse goes nuts as it tries to come to terms with what's going on. It may run faster on the track from time to time, but the animal is never the same again.

Now, if you eat a horse with blinkers on, it's not that different to eating one without blinkers. However, if you eat foods that have been genetically modified, research indicates that the abnormalities within those genes start becoming part of YOUR genetic makeup. In other words, if you eat GM wheat spliced with a gene that creates a natural pesticide, your own stomach could start producing that pesticide because it's now part of your genetic blueprint. GM foods given to rats also showed a sudden change in behaviour which greatly reduced their social interaction with other rats. The fact that GM foods can affect the brain like this shows just how connected and susceptible we really are to slight changes in our DNA.

Based on my research, there is so much negative research on GMO that only a corporation with a most vicious of agenda could be responsible for unleashing it on the human public. To me, it's pretty logical - we are all connected at a quantum level so a small change to our starting point (ie. our genetic blueprint) MUST result in a significant change to us as human beings somewhere down the line, even if this change takes years to manifest. However, my evidence is not conclusive and ironically that's exactly the whole argument *against* GM foods. There is simply no way this kind of food should be let loose to South Africans (or the world) without proper, independent testing. We cannot rely on the research conducted by the very companies that supply the stuff! Have we learned nothing from the tobacco industry who lied to us all those years ago to tell us that smoking was safe? Or thousands of other products for that matter?

## Why would we let this happen?

For one, few people know about them. Also, GM foods have been dubbed the solution to world poverty. They grow better, their yields are higher and they are more resistant to disease than any other kind of farming methods, *except proper organic farming*. When applied correctly there is no higher yielding, higher nutrient content, healthier or stronger plant in the world than home grown organic food. This is why I am so passionate about this cause.

However, we are not growing our own food. Therefore, there is pressure on our centralised decision making powers to alleviate world poverty by using GM foods that grow well using conventional farming methods. Actually, growing our own food is the solution to world poverty, but there is not much money in it.

There are a couple of commercial reasons for GM foods to be used. Firstly, Monsanto (one of the main GM players) produces the most widely sold pesticide in the world called "Round Up". It just so happens that they also produce special GM seeds which ONLY ROUND UP WILL WORK ON! In fact, Round Up will kill just about every living thing that comes into contact with it EXCEPT for the specific plant that has been genetically engineered to resist it. Monsanto therefore controls both the seed and the pesticide which only that seed is immune to. Now that's marketing baby!

[By the way, ProNutro provides an example of a South African product made from Round Up Ready GM Soy. See here:

<http://www.safeage.org/campaigns/GM%20Free%20Food%20List%20Campaign/June%202008%20Testing.htm>

### **Seeds with an expiry date**

It gets worse. You see, GM companies have learned to limit the number of times a seed can germinate. So when you buy the seed, that plant can only reproduce say three times. After that, you are forced to go back to the company that supplied the seed (ie. Monsanto and the like) to buy more. This is a bit worrying considering that the most beautiful thing about nature is its ability to reproduce indefinitely. We mess with that and we mess with the perpetual survival of not only that species, but potentially any species that feeds on it.

It still gets worse. You see, GM seeds are patented by these companies, so their intellectual property is protected and enforced by the courts. Anyone found in possession of GM seeds without paying for them is therefore "stealing" and anyone caught selling the plant that was grown from these seeds is infringing their copyright. You laughing yet? Try not to because there have already been hundreds of cases where farmers have been successfully sued by Monsanto and others so badly that their farms, often many generations old, have been lost. Serves the farmers though for stealing patented seeds, right?? Well, wrong actually, because in many cases seeds were carried in from next-door farms by winds that blew them accidentally onto their land.

GM companies have serious legal teams in place to fight anyone that stands in their way. How is any little guy to survive an onslaught like this from the giants that seek to control the global food chain through genetic manipulation? The good news is that there are some who are fighting them.

### **Can GM foods be contained?**

Most of the world's grown food are used to feed animals, not humans. We then eat the meat. Already there are countless cases of farmers who conducted their own research on pigs and cows to see first hand the effect that GM foods have on their livestock. When they eat GM corn, the animals reduced in fertility. Once they go back to their original diet they eventually recover, but then there still is debate on whether they really DO recover now that their genetic makeup has been tampered with. Let's not forget that the vast majority of these pigs and cows that are fed GM foods have been bred specifically for human consumption.

Once the genetic change has occurred, how do we know this won't be passed to offspring? I personally think this is pretty unlikely, but still... is it worth the risk? Surely we should not be subjected to GM foods without even being told about it, or being asked to evaluate the research ourselves? Once they are let loose on the South African population (which is now gaining momentum as we speak), the genetic screw up could explode across our population like a virus and it could be years before we even know about it! This has actually happened before.

### **But we've been eating GM for years!**

This is the counter argument which is rubbish. Yes, already we are drinking GM milk (or milk from cows who have been treated with a GM hormone) as well as other direct or indirectly modified foods and this fact alone is raising serious health alarms. But that's not the point and here's why: now read this carefully, because this is important...

You can argue that the nartjie is genetically modified and we eat them happily. You can say we breed certain types of funny shaped poodles too. But this is called "selective breeding". Selective breeding is at the far left on the scale of genetic manipulation because the process is far more natural. If you want to develop a cabbage that is resistant to a certain fungus, you grow a whole bunch of cabbages that are subjected to this fungus. Most cabbages will die out very quickly, but some will be more resistant. Take

the seeds from those plants that are resistant and repeat the process again and again and again. The result is a much more resilient cabbage, although it takes several generations to work. The finest wines in the world are the result of modifying the genes within the grape using this method of natural refinement.

The other end of the scale is the short cut and this is where GM foods are. Here we simply "play" with the genetic code so, hey presto, like magic you have the plant that you "think" does what would have taken many generations of natural selection to do. It looks like a lovely, large, juicy red apple, but is it really? What if we're wrong? There is a very large grey area in this scale indeed and quite frankly, this is a grey area that we simply don't need to play in. For example, did you know that most white mielies found in South Africa are GMO?

### **Are GM foods necessary?**

We simply don't need them. With a little education, we can grow our own food. The issue of soil density and quality is always a factor, but again, the right training with correct companion planting and rotation means that we can grow organic foods in our own backyard with up to 10-20 times the nutritional density of the fruits and veg that we currently buy at local shops. We don't need to wait for corporations to make GM foods the standard when we can start living healthier NOW! We need to take back the power we've always had: the power to grow ourselves.

Further reading:

<http://www.aemonline.org/gmopost.html> (American Academy of Environmental Medicine)

<http://www.saynotogmos.org/>

<http://www.safeage.org/> (South African)

<http://video.google.com/videosearch?q=The+World+According+to+Monsanto&emb=0&aq=-1&oq=#>

(French documentary on the subject, in English)

Next time I'll be more "positive" I promise!!

Scott

## Lesson 6: Preparing your Soil

Tell me, what exactly were you and Susan van Rensburg doing behind the boys bathrooms at break yesterday? Mrs. Macalpine from 12M nearly called the fire department! I told her that it must be her eyesight going again as the Scott I know would NEVER do anything disorderly.

I am sad to announce that there are only a couple lessons left (sob), but today we are going to talk about how to prepare our soil. Hooray!

Did you know that there is a substance in existence right now that can radically improve our soil quality? It even removes much of the pollution from our water systems. It's called EM: "effective micro-organisms". They are a completely natural way of using nature's little helpers to clean our earth and water. (See an astonishing documentary on how they used EM to clean an entire inland sea in Japan here: <http://video.google.com/videoplay?docid=6597063111588271889#!>) My family and I even drink it as a pro-biotic.

The health of a plant is directly related to the health of the soil it grows in. Unfortunately, the state of our soils is so bad that more chemical fertilizer, more pesticides and more food processing is required every year to keep our food resembling food. As Thomas Linders says, *"people talk about this global crisis and that global crisis. What about the soil crisis???"*

For those new to organic gardening, preparing your soil can be complicated and time consuming. If you want a "quick fix" just go out and buy good soil. It's cheap and your results will be great, especially if you are planning to grow in a pot. I know this because that's precisely what I did.

So, I won't be offended if you don't pay much attention in today's lesson. However, for those that are serious about the critical science of soil preparation, then let me welcome Elsie Roulston!

**Elsie, what's so special about soil? It's just there to anchor the plants, right?**



Well, yes and no. If you're farming with chemicals then yes, the soil is merely a medium in which to grow the plants, you might as well be growing them in polystyrene pellets. All the extra chemicals and fertilizers you spray onto your crops will feed them and keep them healthy.

If, on the other hand, you want organically grown plants then it's a big NO! The success or failure of your crop will depend on the quality of your soil. If we want strong, healthy plants which are resistant to pests and diseases all we need do is look to nature. Since the dawn of time soil has provided plants with all the

nutrients and minerals they could possibly want, there was no need for vast amounts of fertilizers and chemicals to keep the plants healthy.

If that's the case, why am I writing this article? Surely, if you plant a few seeds in your garden you'll be rewarded with a bountiful harvest. Unfortunately this is not the case, many years of meticulous maintenance and careless building practices has robbed our garden soils of nutrients and poisoned them with cement and other toxins.

### **Ok, enough gloom and doom, how do we get the perfect soil? ...and what is the perfect soil anyway?**

Quite simply, we undo the harm we have done by replacing the organic matter we have removed. Our goal should be to promote and support a healthy soil.

A healthy soil is alive! It is a home for living organisms (soil fungi, algae, bacteria, insects, worms and burrowing animals) who convert organic matter into a more usable form for plants. Make a home for these organisms and you'll be rewarded with the perfect soil. The perfect soil has a rich, earthy smell, is dark brown in colour, rich in organic matter, a crumbly texture and is full of earthworms, which are far more useful in your soil than bait at the end of a fishing line.

### **What must I do to improve my soil?**

#### *Step 1: Get to know your soil*

There are many types of soil all with their own pros and cons but the backyard farmer doesn't need to worry about the technicalities too much. For most of the problems there's one solution – COMPOST. Adding compost to a clay soil will improve its drainage whilst adding it to a sandy soil will improve its water holding capacity. It's not an instant fix, but diligently adding organic matter to the soil every now and again will give the existing organisms in the soil a chance to do their part in raising your soil's fertility. If you're really impatient and want it corrected instantly, I suggest you take a soil sample to a soil lab (contact your local Department of Agriculture) and ask that they suggest organic fertilizers to improve your soil's fertility. They will then recommend the exact amounts and types of fertilizers you would need.

You should also invest in a soil PH testing kit (available at most nurseries). Why? The PH of a soil determines the availability of nutrients in the soil. Most vegetables require a PH of 6.5 but again, don't stress too much about it. By constantly adding organic matter (neutral PH of 7) to your soil you will be able to raise the PH of your soil slowly to the ideal range. If your soil is far below or above this range then you should take a sample to a soil lab for testing. Blindly adding lime to your soil to correct the PH, could be disastrous, too much 'locks up' nutrients and scorches roots. Never add lime to manure as nitrogen (promotes healthy foliage) is then released from the soil. Only apply lime several weeks before planting.

#### *Step 2: Support nature*

The goal of organic gardening is to mimic nature. If we get this right we will be able to sit back and enjoy a well deserved sundowner on the patio whilst our garden tends to itself.

For a successful vegetable garden we should avoid the following:

- **Badly drained, waterlogged soils** - Our plants need to breath! If you have a high water table or very poor drainage then the best solution is to build raised planting beds.
- **Bare soil** - It's a waste of resources.
- **Digging**
  - Digging damages the soil's structure, even more so when digging wet soil.

- Limit digging to the initial preparation and then once every 5-10 years.
- Rather use a hoe for removing weeds.
- **Over application of fertilizers** - Use organic fertilizers only when it is necessary, the organic matter which you add should have more than enough nutrients and minerals.
- **Walking over beds** - Ever seen a footpath cutting across the lawn? It compacts the soil which you have worked so hard at aerating. Use pathways between planting beds. The beds should not be wider than an arm's length (60cm), so that they are easy to maintain.
- **Introducing unwanted weeds and chemicals into our garden** – if you are going to buy soil, well rotted compost and well rotted manure for your garden, get it from a reputable company. Don't be tempted to buy cheap products from just anyone. Rather spend a little extra and not have to worry about spending the next few months getting rid of a new crop of weeds.

Apply the following practices to improve the condition of your soil:

1. **Crop Rotation**
  - Maintains mineral balance of soil
  - Reduces build up of diseases
  - Best use of organic matter i.e. allows soil to replenish itself, less input from you
2. **Use mulches** (grass cuttings, herbs cuttings, straw, nut shells, compost, old carpets, etc)
  - Suppresses weeds by excluding light
  - Conserves water
  - Helps maintain a stable soil temperature which promotes growth
  - Adds fertility to the soil
  - Improves soil texture
  - Protects the soil from erosion

*[Mulch is a protective layer of organic matter that is placed on the top of the soil.]*
3. **Encourage existing micro-organisms and earthworms**
  - Micro-organisms and earthworms breakdown organic matter releasing nutrients
  - Earthworms loosen and aerate the soil, vermi-compost/ worm castings promote root growth whilst vermi-liquid/ worm wee is full of nutrients
  - Dig as little as possible. Digging breaks up the soil's natural layers and air pockets (network of earthworm tunnels and decaying roots) which assist drainage.
  - Keep the soil moist and apply mulches (feeds the earthworms)
  - If you feel your soil could do with a boost, then use EM (Effective micro-organisms)

*EM has many applications and can be used as a compost activator as well as a soil conditioner. It restores balance by reducing harmful bacteria and encouraging the growth of beneficial bacteria.*

4. **Feed your soil!**
  - Use well rotted manure, compost (preferably from your own compost heap) and don't forget mulching.
  - Use organic fertilizers such as dried blood, fish and bone meal, seaweed liquid and meal, rock potash, wood ash, liquid animal manures, worm castings and 'worm wee'.
  - Grow green manure crops. It is a quick growing annual plant which is grown as a temporary groundcover and then dug into the top 15-20cm of soil as a fertilizer. Planted in an area of the garden which is not being used, they convert otherwise wasted sunlight and resources into useful organic matter. Sow as soon as soil is bare and until the first frost, cut down before flowering or going to seed and cover with a thick mulch or dig into top layer of soil. Plant annuals rather than perennials as they are easier to control. e.g. mustard, alfalfa, fenugreek, legumes (leave roots in the soil), borage and comfrey (acts as a compost activator). They remove scarce minerals from the soil and make them more available to your crops and helps to prevent erosion and leaching of nutrients.

## **Right, now that we've got a good idea of how to maintain a healthy soil, let's get that veggie garden started!**

### *Step 1: Don't forget to plan*

- **Check for Services.** Make certain that you aren't going to dig up sewerage pipes, electrical cables, irrigation pipes or the long forgotten septic tank.
- **Find that perfect spot for your garden.** It should be close enough to the house to quickly nip out to pick a fresh tomato or see if your seeds have come up, be close to a water source and have about 6 hours of sunlight.
- **Decide on the size and style of the vegetable garden.** Start small and in no time you'll have more than enough vegetables for yourself and to show off to your friends. A plot the size of an average door (2m x 2m) is perfect for a family of four. Do you want a traditional kitchen garden, a pottage, a mixed border in your garden, a water-wise eco-circle (1m diameter) or an economical Peace Garden (1x2m)?

### *Step 2: To dig or not to dig?*

#### **The digging or trenching method**

This method is useful if you have rocky soil, a shallow layer of topsoil or if you want to start planting right away. It is an instant way to increase the depth of your topsoil. It breaks up the subsoil and adds organic matter thereby increasing the depth of the root zone. Roots are encouraged to grow downwards (draw nutrients at a greater depth) and one can plant closer together (bio-intensive gardening). This is the method used for Eco-circles and Peace Gardens.

- Mark out the area (1m x 60cm).
- Remove all plant material (a good time to start a compost heap), stone and debris.
- Remove the top 30cm of topsoil and place to one side.
- Remove 30cm of subsoil and place to one side.
- Loosen the bottom of the trench with a garden fork.
- Layer 5-8cm organic material, then 15cm subsoil, water well, repeat layers.
- Mix topsoil with 1 bag of compost and a handful of bone meal, place back in trench.
- Cover with a mulch and apply EM to start things off

*\* The organic material can be manure or use the trench for composting (takes about 6 months).*

There are three main methods of starting a vegetable garden which don't involve digging, they do however require about 6 months.

#### **Method 1: In-situ compost heap - where you have a large amount of weeds**

This method relies on the work of micro-organisms to breakdown the weeds and earthworms to work the compost into the soil. What you are left with are raised mulched beds full of nutrients.

1. Stack slashed down weeds; you can leave the roots in the soil as they will be composted.
2. Cover with hay to keep tidy and deprive any existing weeds of light.
3. Apply a compost activator (EM will do the trick) to get things started and treat as a compost heap.

#### **Method 2: Sheet mulching - where you have fewer weeds**

This works on the same principle as the in-situ compost heap.

1. Stack slashed down weeds; you can leave the roots in the soil as they will be composted.
2. Place a sheet of cardboard, newspaper (6 layers), old carpets or even old clothes over the weeds.
3. Add a layer of mulching (+/- 10cm) on top which will hold down the first layer whilst allowing water and air to pass through.

Make holes through the mulching to plant your first crop. Make sure that the mulching doesn't get too wet as this could lead to rotting. Check every now and again under the 1st layer for pests. e.g. slugs

### **Method 3: Chicken tractor - where you have fewer weeds**

The chickens are placed into an enclosure over the area. They then scratch out weeds, loosen the soil surface, add manure, eat the weed seeds and pests (cutworms, snails, grasshoppers, etc.) and if you were clever enough to get laying hens you'll have organic eggs for breakfast too. Once they have cleared the area all you need do is loosen the ground with a fork, work in some compost, a bit of bone meal a dash of EM and you're ready to plant.

After all that reading, here are some images to motivate you to start preparing your soil for spring.

*If you need any assistance in planning your vegetable garden or an organic garden feel free to contact me. We have a Facebook page - Space to Place Designs or follow the Landscape Design link @ <http://www.plantzone.co.za/>. We'll also be at the Green Market (Moreleta Kloof Nature Reserve, Helios St, Moreleta Park, Pretoria) every 1st Saturday of the month.*

#### *Useful Links*

- More about EM (<http://emrojapan.com/aboutem.php>)  
Contact Nico Kotze @ 083 260 6643/ [nico@wag-online.co.za](mailto:nico@wag-online.co.za) should you have any queries or Thomas Linders on 082-457-4586.
- More about eco-circles (<http://biophile.co.za/gardening/circle-gardens-a-discovery-par-excellence>)
- More about food gardens (<http://www.foodgardensfoundation.org.za/>)
- Booklets about growing vegetables and herbs from the department of agriculture (<http://www.nda.agric.za/publications/publications.asp?category=InfoPaks>)

#### *Sources for the article:*

1. Cultivating Flavour - Kitchen gardening for kindred spirits by Toni B Walters
2. Organic Garden Basic by Bob Flowerdew
3. Organic Gardening by Geof Hamilton

***The final lesson, Lesson 7, is comprehensive and can be downloaded separately from the same page this documented was downloaded from.***