GROWING VEGANICALLY

Because being vegan isn't just about what we eat!

Written by Jenny Hall for the Vegan Organic Network (VON). This booklet is designed to give you a starter into the world of growing veganically, that is without the use of toxic chemicals or deliberate animal inputs. Better for you, the animals and the planet.

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Can you grow food without chemicals or animal manures?

Absolutely, because all biological sources of fertility originate from plants.
Thousands of farmers and growers across the globe are showcasing how Veganic offers solutions to many pressing issues. “Veganic” is a combination of the two words “vegan” and “organic” to create a new concept for farming. World agriculture must move towards "people nourished per hectare".

This is where large-scale Veganic agriculture proves itself to use less land, water and fossil fuel resources than livestock dependent systems. Simultaneously it also causes less harmful greenhouse gas emissions and polluting wastes. Veganically produced food is resilient to the largest problems facing humanity, namely peak oil, availability of fertile land and climate instability.
In 2005 the Vegan Organic Network (VON) produced the world's first set of Veganic Standards to be certified by inspection.

Farmer Iain Tolhurst (Tolly) explains his reason for becoming certified:
"We have never kept livestock, and as organic growers we began to seriously question the wisdom of importing fertility back in the early nineties. We banned the use of fish, blood and bone on our farm in the light of the BSE crisis. To this day slaughterhouse byproducts can still be used in potting mixes for organically approved seed raising." (eg John Innes formulas)

Slaughterhouse byproducts and manures are two sides of the same industry

Most consumers assume that organic production relies on animal manures to support fertility.

- Bringing manure in from another farm is depriving that farm of its own fertility.
- The transport of bulky manures is expensive.
- Non-organic manures may contain antibiotics and wormer residues.
- All manures under 5 months old pose an E.Coli risk.
- Non-organic manures are a by-product of livestock systems that depend on imported feedstuffs like genetically modified soya. Even organic livestock farmers rarely are closed loop as they by in feed etc. There is a direct link with deforestation in the Amazon and the feeds livestock, horses and pets eat in the UK. Many vegetable, fruit and grain farmers do not have livestock, so to improve their resilience they need to develop fertility systems that are towards closed-loop and non-reliant on the livestock industry.

Tolly continues:
"We worked closely with VON to establish Standards in 2005 and were the first farm in the world to become registered as such. The Standards were set up for those wanting high quality, locally available and organically grown food without the use of slaughterhouse by-products or animal manures."
Farmers and growers can become certified Veganic by formal inspection by an organic certifying body, such as the Soil Association in the UK, or informally by a grower-to-grower scheme using volunteer inspectors.

Farming and climate

Climate instability is almost universally accepted as being caused by human induced atmospheric release of GreenHouse Gases (GHG) into the atmosphere. Only professional deniers, funded by the fossil fuel lobby, and blinkered politicians, still doubt the science.

Change without borders

Human-driven global warming threatens to destabilise climate systems across the entire planet. Climate change does not respect international borders. GHG emissions in the UK are already contributing to hardship, famine and death in undeveloped nations, those least equipped to deal with rapid environmental change. To avoid runaway catastrophic climate change, industrialised nations must start making drastic cuts.

Belching our way to climate chaos

Yet one human-driven activity is responsible for more global emissions of GHG than the world's entire transport sector and that is livestock farming. Worldwide, livestock produce18 per cent GHG. One of these, methane, which is released when livestock such as cattle breathe out and 'burp', has 23 times the global warming potential of carbon dioxide. Other problems include the augmentation of the nitrogen cycle (leading to nitrous oxide which is 296 times more potent that carbon dioxide). Growing soya for livestock feed and ranching are major contributors to deforestation, thus contributing further to GHG.

Grazed and Confused

Meta analysis by the Food Climate Research Network has shown the potential of grazing livestock to contribute to soil carbon sequestration is small, time-limited, reversible and outweighed by the GHG they generate. Ruminants (cows and sheep) contribute 80% of total livestock emissions, and even with careful grazing management the report found that this would only offset between 20-50% of annual emissions of ruinants.

Veganic principles for climate friendly food

• reduce the second population explosion (human's being the first population explosion) of livestock through a moratorium on breeding to stop the associative environmental problems highlighted in Livestock's Long Shadow;
• move away from industrial inputs including Haber-Bosch nitrogen, artificial chemicals and genetically modified organisms;
• move towards "people nourished per hectare" on arable land where starchy vegetables and grains (for direct human consumption) become the majority of farmed arable land. Market gardens and allotments will then provide the micronutrients of more perishable fruit and vegetables;
• move towards soil conservation practices on arable land including reintroducing flowering green manuring leys to reverse "insectageddon" (decline of insects);
• return society's organic wastes to market gardens / allotments;
• move towards "people nourished per hectare" on some marginal land with an emphasis on fruit bushes, orchards, nut groves and forest gardening.

The vast majority of marginal land will be for other uses including forestry, managed conservation (e.g. rewetting peat bogs) and rewildling, all of which will help with flood prevention caused by bare hillsides;
• and move towards renewable energy for farming and a localised food system where practicable.

The Veganic approach offers a viable, holistic and accessible way of ensuring that present and future generations can live safely and comfortably, as well as eat abundantly, healthily and harmoniously within the earth's finite limits.

Soil care

Eve Balfour's the Living Soil is as vibrant and important now as when it was written over seventy years ago. Her premise is care for the soil by increasing its organic matter and not using biocides, then sustainability will follow. "The health of soil, plant, animal and man is one and indivisible."

Nutrients harvested in crops need to be replaced. Fertilising soil through Veganic practices has a positive impact on the soil's physical, chemical and biological quality. However, it would be logistically impossible to fertilise all the world's arable lands (1.2 billion hectares) with livestock manures or organic wastes alone. Green manure leys (eg clover, lucerne and vetch) have an important role to play in nitrogen fixation and their flowers also become an important nectar source for insects. Green manuring allows the soil a rest from constant cultivation and chipped branch wood is also a useful arable soil amendment.

Composting

Composting is a key technique of the Veganic grower; defined as aerobic decomposition (in the presence of air and moisture) of organic waste carried out mainly by bacteria. Compostable materials must have been previously living to ensure they rot to organic matter. If you follow guidelines, then you should be left with friable dark compost that crumbles in your hands and smells pleasantly earthy. The golden rule of bacterial composting ingredients is two parts “greens” one part “browns”, in the presence of moisture and air.

Fungal compost, eg leafmould or woodchips, are best left open to the elements.

Greens, Nitrogen-rich	Brown, Carbon-rich	Not suitable
Fruit & veg peelings	Crunched cardboard	Leafmould (fungal)
Grass cuttings	Straw, Hay	Woodchips (fungal)
Crop residue	Older crop residue	Cooked food
Annual weeds not in seed	provided not blighted	Seeds and roots of weeds

Troubleshooting bacterial compost

Soggy and sour smelling compost - too many “green” ingredients means there is insufficient carbon to provide energy to the bacteria for the break down process. If there are no air spaces it will be taken over by anaerobic bacteria. This can be remedied by adding more brown ingredients (especially straw with its hollow stems or scrunched up cardboard); chopping materials to increase air pockets and turning the heap to increase air pockets.

Compost that isn't breaking down - too many “brown” ingredients means that it is too dry. This can be remedied by adding more green ingredients (especially grass cuttings to add moisture); chopping up brown ingredients and thoroughly mixing greens to increase surface area that the bacteria can break down, and possibly irrigating the heap with a watering can.

Mix is good but still too wet - excess moisture will drown the composting bacteria as the moisture level should be the equivalent of a wrung-out sponge. You need to stop rain water soaking into the heap by covering with a tarpaulin sheet and ensuring rain drains outside the heap. The other overlooked problem is stopping ground water soaking into the heap by having a pallet or drainage pipes underneath the heap so there is an air void. Do not place heap on a slope, near a waterbody (eg pond or river) and have a means to capture leachate out of the compost heap (eg bucket sunk into the ground) if you are concerned or want to make use of this valuable resource.

Green manuring

Green manuring is a key technique of the Veganic grower. Getting to grips with green manuring will take time.

Advantages

- Sometimes there is not enough compost – grow your own.
- Bare soil in winter is bad. The overwinter green manure roots hold the soil and the top greenery stops damage to the soil surface.
- Nutrient loss is reduced - nutrient leaching from bare soil is greater than losses

of nutrients from cropping.
• Fertility building phases also help with weed control.
• Deep rooting green manures bring up phosphates and potash from the subsoil.
• Regularly mowing green manures like red clover, white clover and lucerne provides the perfect earthworm breeding habitat, if they are mowed and mulched in situ.

Disadvantages

• Fertility building phases take land out of production; they may not be needed if you have access to enough compost materials.
• Green manure management techniques take time to fully master.
Nitrogen-fixing bacteria on the roots of clover are provide the single most important input of nitrogen in organic farming in the UK. The rhizobium bacteria, living in the root nodules of the legume, have the ability to take nitrogen out of the air and process it into a plant food.

Nitrogen-fixers include: clovers, trefoil, lupins, vetches, lucerne, fenugreek, peas and beans. **(Most commonly used green manures.)**

Long term fertility builder which will mow	Red clover, white clover, lucerne, sainfoin
Maximum nitrogen fixer in summer	Crimson red clover, vetch
Good for paths (resistance to foot traffic)	White clover, yellow trefoil
Undersowing in field (ideally sow first week of July)	Red clover, white clover
Undersowing in field (lifter, plant after August)	Barley, oats, cereal winter rye
Later legume (sow no later than September)	Vetch
Undersowing polytunnel crops (fixer) Red clover, white clover, lucerne	Kent wild white clover, yellow trefoil
Over winter green manures killed by frost	Phacelia (will survive light frost) buckwheat, mustards)
Summer weed suppression (organic material to turn in)	Buckwheat (mat of roots good at controlling couch grass), Phacelia
Reducing wire worm populations before potatoes	Mustard

Nitrogen-lifters: have the ability to scavenge nitrogen out of the soil and hold it in the plant to prevent it being leached out. Cereal green manures like rye can be sown much later than clovers. Spring / summer green manures buckwheat and phacelia, are also really good pollen makers and attract the bees.

Sowing a green manure

- Sow into a weed free soil or a possible stale seedbed (after first flush of weeds has been removed)
- Broadcast (sow) the seed
- Rake into the soil
- Firm the bed (not possible with undersowing)

Chipped Branch Wood

Chipped branch wood is a key technique of the Veganic grower. The difficulty with incorporating sawdust, shavings or bark into soil is it will lock up nitrogen for annual crops for many years. To be in equilibrium with the soil, organic amendments need a C:N ratio of about 10:1 (good quality compost), but trunk wood has a ratio of between 300:1 to 600:1.

Difference between trunk and Chipped Branch Wood (CBW)

- CBW is made from deciduous trees in full leaf whose twigs, stems and branches have a diameter of less than 7cm;
- CBW has a lower C:N ratio than trunk wood;
- CBW has beneficial amino acids, sugar, cellulose, pectin and starches for the growing of annual crops.

Using Chipped Branch Wood

- Apply in autumn before the sowing of a green manure (2 weeks later) or allow soil to green up with weeds (bare soil in winter is bad).
- Chip the wood into small pieces, no larger than a few millimetres thick and a couple of centimetres in length.
- Do not compost the chips as much useful energy will be lost.
- Spread immediately after chipping at 1-2kg per metre^2
- The chips are not a mulch and so need to mix with the top 5cm of soil through raking.
- Inoculating with leafmould at 10-20g per metre^2 can help kickstart the beneficial fungal process.

Rotations are a key technique of the Veganic grower

Annual crops like vegetables are grown from seed. Annual crops are grouped together in families that rotate to different plots. They are rotated so that the same family does not come back to the same soil for at least four years. This stops the spread of soil borne fungal diseases, particularly club root and white rot.

Know your families

A. Potatoe and Courgette Families
Potatoes, Tomatoes, Sweet pepper, Chilli Peppers and Aubergines.
Courgettes, Squash, Pumpkins, Gourds, and Okra.

B. Onion and Bean families
Spring Onion, Bulb Onion, Leek, Garlic.
Broad, Runner, French Bean, Sugar Snap Peas.

C. Cabbage, Turnip and Mustard families
Cabbage (red, white, green), Brussels, Kale, Calabrese, Broccoli, Chinese Cabbage, Pak Choi, Mizuna, Rocket, Mustards. Swede, Turnips, Radish.

D. Carrot, Beetroot and Lettuce Families
Carrot, Parsnip, Celery, Parsley, Coriander. Beetroot, Spinach, Chard. Lettuce. Winter purslane

Plants in **(A) Potatoe Families** and **(C) Cabbage, Turnip and Mustard Families** like lots of feeding and need compost applied in late March.
Those in **(B) Onion and Bean Families** and **(D) Carrot, Beetroot and Lettuce Families** like low fertility and use the compost from the year before.

It is possible to turn this into a six plot rotation and insert a green manure the year before the potatoes, and a green manure year before the cabbage family, if you cannot access sufficient compost.

Year	Row 1	Row 2	Row 3	Row 4
1	Potatoes(A)	Onion(B)	Cabbage(C)	Carrot(D)
2	Onion(B)	Cabbage(C)	Carrot(D)	Potatoes(A)
3	Cabbage(C)	Carrot(D)	Potatoes(A)	Onion(B)
4	Carrot(D)	Potatoes(A)	Onion(B)	Cabbage(C)
5	Potatoes(A)	Onion(B)	Cabbage(C)	Carrot(D)

Vegetables for beginners

(A) Potato and Courgette Families

New potatoes (first earlies) – plant seed potatoes outdoors last week of March
Salad potatoes (second earlies) planted end March
Maincrop potatoes planted end of March
Courgettes, squash, pumpkins (sow for plugs 2nd week May in greenhouse)

(B) Onion and Bean Families

Spring onions (sow for plugs April in greenhouse, 8 seeds per module)
Broad beans (direct sow outdoors April)
Onion sets – red and white sow first week of April
Leeks sow first week of April
Sugar snap peas (direct sow outdoors beginning May)

(C) Cabbage, Turnip & Mustard families

Spring cabbage (sow for plugs April in greenhouse)
Calabrese (sow for plugs April in greenhouse)
Kale – takes less space than cabbage and can be eaten over time (sow for plugs 2nd week of April)
Purple sprouting broccoli (sow for plugs 2nd week of April
Rocket / Radish (direct sow outdoors first week May)

(D) Carrot, Beetroot and Lettuce Families

Early carrot variety (direct sow outdoors first week May)
Early beetroot variety (sow for plugs April in greenhouse)
Lettuce (sow for plugs mid April then lettuce every two weeks until mid June.

Direct sow first week of June
Carrots Parsnips Spinach beet Chard
Direct sow second week August
Coriander Parsley Spinach (true)

Salad rotations

Health and safety for salad leaves

Always surface dress the soil with plant-based compost. All growers recognise the Ecoli risk from animal manures even if they are not Veganic. Salad leaves take up nitrates readily when growing under suboptimal light especially in early spring – do not grow in spring after digging in a nitrogen fixing green manure or fresh green compost.
Most of this advice is based on the work of Charles Dowding www.charlesdowding.co.uk, Growing Communities Patchwork Farms www.growingcommunities.org and Organic Lea www.organiclea.org.uk who are not necessarily Veganic growers themselves.

Top tips for growing

- Many salad plants can be long-lived when correctly chosen for their season.
- Shallow cultivation – rake is ideal for small areas.
- Surface dress with plant-based compost before each planting.
- Plant 22cm apart in all directions on a diagonal pattern.
- For directly sown seeds observe a stale seedbed i.e. let the first flush of weeds germinate and then hoe them out.
- Start early spring lettuce, spinach chard, most of which will crop until July.
- Late May sowing lettuce, chard, red orach.
- Late July lettuce, rocket, endives, chicory, kale.
- Late August oriental leaves, rocket, endives chicory, winter purslane.
- Keep salad leaves weed free or it makes difficulties for harvest.

Top tips for harvesting

- Always leave the small central leaves because they are plants' "engines of growth".
- Pick outer adolescent leaves as opposed to cutting across top.
- Pull off any decaying or eaten leaves and translocate slugs.
- Sow new modules ahead of bolting especially with lettuce.
- The number of pickings before plants bolt is variable, according to season, variety and sowing date. For example, lettuce sown in March can continue for ten weeks or more, while salad rocket sown in April will yield perhaps two harvests.
- Leaves from plants that are grown in healthy soil, when rinsed and then kept cool and moist, will keep fresh and lively for several days after picking.

Outdoor rotation of salad leaves

	Fertility building	Brassica family	Lettuce family	Beet family	Misc
Main season	Red clover	Turnip tops, wild rocket, mizuna	Lettuces	Red orach	Coriander Celery Leaf
Autumn / Winter	Red clover	Red russian kale, mustards	Endives	Ruby chard	Claytonia Sorrel

Polytunnel rotation

Early Spring	Red clover	Mizuna Salad rocket Red streaks	Lettuce	True spinach Red orach Coriander	Basil
Autumn / Winter	Red clover	Mizuna Wild rocket Mustards Red streaks	Overwinter lettuce Endive	Ruby chard	Coriander Flat parsley Claytonia

Coping with competing weeds and animals

Couch grass, slugs and rabbits can ruin any attempts to grow veganically and we opt for cruelty-free means of control.

Perennial weeds

Initially, dig the plot as soon as the weather conditions will allow and remove the reproductive parts of perennial weeds like couch, bindweed, dock to the best of your ability. This is hard work. Other greenery can be buried so that the soil surface is clear. After that, fortnightly hoe the soil although it may be still necessary to dig out any perennial weeds you have missed. Control strips (hoed strips) at the edge of beds will also reduce a favourable habitat for slugs. When crops are growing the hoe really is your friend and you should aim to do this in sunny breezy weather once a fortnight.

Rabbits

If rabbits visit your garden then it will be necessary to either erect chicken wire fencing, electric fencing or have large long-term nets.

Slugs

• Keep slugs off propagation tables so that seedlings get to a decent size before planting out.

• A nocturnal trip around beds with a torch and bucket can yield large numbers of slugs to be translocated. Also laying slabs of wood, black plastic and slate can make it easy to find them.

• Slugs like moist conditions and move on a trail of slime, therefore dry, acidic or irritant materials can deter them. This is why regularly hoeing is so important. A fine soil tilth is hard for them to travel over.

• The long-term solution is to encourage the natural predators of slugs' eggs like centipedes, beetles, newts, frogs, toads and slow worms.

• Moats can form a very effective barrier to slugs if kept filled and debris is removed.

Encouraging biodiversity

Predator and pest balance must be encouraged through encouraging wildlife and biodiversity where you grow crops. Exceptions to this rule apply with couch grass, slugs and rabbits where removal and fencing must be considered.

Insect Friends

Ladybird, Ground beetle, Hoverfly, Lacewing, Centipede, Parasitic Wasp. Know the egg stage and larvae.

Animal friends

Frogs, toads, newts, slow worms, hedgehogs, bats, birds, stoats, raptor birds, foxes.

Provide water, shelter and a winter home

Pond, hedge, orchards, nut groves, forest gardens.

Biodiversity strips

Nettle, tussocky grass, beetle banks, wildflowers, phacelia

Flowers

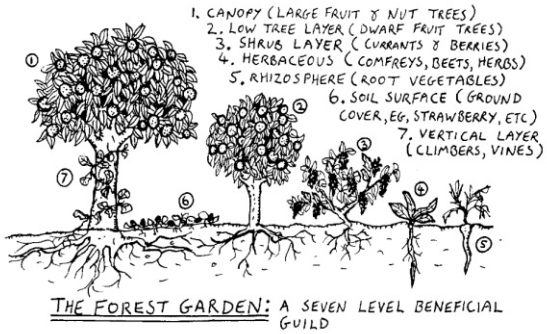
Perennial: thyme, rosemary, sage, mint, sedum, evening primrose
Annuals: cosmos, marigolds, borage, nasturtium

Other features

Bark sheets, messy areas, wood chips, log piles, bug hotels, bat boxes, bird baths, bird feeders

Forest garden theory

Veganic gardener Robert Hart coined the term “forest gardening” in the 1980s but Martin Crawford has taken the subject further than anyone else:
His definition:
A forest garden is a garden modelled on the structure of young natural woodland utilising mainly edible crops. It may contain large trees, small trees, shrubs, herbaceous perennials, herbs, annuals, root crops and climbers, all planted in a such a way to maximise positive interactions, with fertility maintained largely by the plants themselves.



(Drawing by Graham Burnett of Spiral Seed)

Demonstration site at Fir Tree Community Growers (WA11 8RG)

At Fir Tree Community Growers, we are aiming to mimic young forest. If we only ate native varieties there would be slows, haws, wild service tree berries, wild garlic and elder. We feel it is necessary to grow exotic edible perennials, that have been bred to adapt to our wet temperate climate, for a successful forest garden.

We aim to optimise the tree canopy so the trees tend to be planted further apart than with a traditional orchard. Martin Crawford’s garden in Totnes, Devon has over 500 species but ours has far less as we are largely growing crops for sale. The 1.5 acre forest garden is being managed without machinery, therefore we scythe grass and dig out unwanted saplings. Our top tips:

- grow all perennials through black woven plastic squares that have their edges dug into the ground, using steel pins where necessary;
- regularly scythe paths;
- scythe the entire site in autumn and rake the cuttings around the edges of the

black plastic squares;
• control docks by cutting individuals at ground level with a small knife and sow any bare batches to flowers;
• smother areas of grass out with reusable black plastic.

Windbreak at field perimeter

Leylandii was planted late 2015 with a view to being removed in 2022.

N-fixers in the windbreak

In a forest garden around 1/3 of the area covered needs to be nitrogen-fixers. Nitrogen moves through mycorrhizal fungi so doesn't need to be next to the plants. The windbreak nitrogen fixers we have chosen include Elaeagnus Umbellata (several varieties), Elaeagnus Ebbengei, Seabuckthorn (Sirola). Non-nitrogen fixers in the windbreak include cherry plum and rosa rugosa.

N-fixers in the cropping area

Tree canopies should not intermingle with the exception of the Italian alder. This is a nitrogen fixer that is coppiced high like a lollipop. It is an over-story nitrogen fixer and dotted around the forest garden. Other N-fixing lower shrubs include Siberian pea shrub and Elaeagnus Multiflora.

Veganic forest garden at Fir Tree Community Growers, Merseyside (WA11 8RG).
The temperate forest garden is not a closed canopy garden. We put the lower layers on the drip lines of the trees so every layer has access to sunshine.

Layer 1, Canopy trees

Italian Alder (N fixer) and sweet chestnuts

Layer 2, Lower tree

Rootstocks vary but good ones for apples in forest gardens are MM106 and M26 which need staking for 5 years.
• Summer apples – Gladstone, Beauty of Bath & Discovery
• Early Autumn apples – Katy
• Late Autumn apples – Woolbrook Pippin
• Midwinter apples – Cornish Aromatic, Bright Future
• New year apples – London Pippin

• Spring apples – Sanspareil
• Juicing apples – Red Falstaff
• Pears – Conference, Improved Fertility, Louise de Bonne
Other fruit trees - Plums and apricots (various varieties); Cherries (various varieties); Mulberries – Illinois everbearer; Quince – Krymsk; Medlar – Royal; Almond (various varieties); Fig (various varieties) and small leaved lime – salad leaf and for adding to juices.

Layer 3, Shrubs and berries

• American alder – flowers for longer period so better for cordial making. Varieties: Johns and York
• Jostaberry – cross between currant and gooseberry
• Gooseberry – Invicta and then stock plants of all other varieties that will grow in the North West
• Chuckleberries – larger than black-currants and bred by Welsh Fruit stocks
• Blackcurrants – various varieties
• Red currant – Rovada
• Blackberry – various varieties.
• Loganberry – thornless
• Tayberry – unnamed variety
• Minor berries – Japenese wineberry; plum yew
• Chokeberry – Aron, Hugin, Nero, Viking
• Note we are not intentionally growing raspberries as they send out runners and are more prone to diseases.

Layer 4, Herbaceous layer

• Globe artichoke – grown from seed.
• Rhubarb – Victoria
• Ramsons – wild garlic
• Comfrey (phosphate accumulator not edible)

Layer 5, Soil surface

• Easy to grow self-seeding flowers increase the insect forage of the forest garden, calendula, crimson red clover, phacelia, cottage garden favourites.
• Strawberries
• Mint – to run through the forest garden and has a fumigating effect
• Other woody herbs e.g. thyme, rosemary, sage, oregano

Layer 6, Roots and tubers

None presently planned. We grow these elsewhere in our market garden

Layer 7, Vertical and climbers

None presently planned but could include, grapes and kiwi (in warmer areas)

Things that don't grow well in forest gardens

• Traditional grains & tubers – potatoes, wheats, oats usually grown alongside field scale.

• Annual vegetables that need full sun conditions.

Surviving peak oil

We believe our ways of food production complement other leading thinkers like Richard Heinberg (Post Carbon Institute) as to how we run societies without cheap oil. He said:

"If the 20th century was about moving people off the farms into the cities, if it was about depending more and more on limited but powerful fossil fuels to replace human labour in food production and to move food ever further distances, the 21st century is going to be just the opposite...It's going to be about the increasing need for human labour inputs and the need for more farmers as a percentage of the population."

Relocalisation

Producing more basic foods locally, through independent / co-operative retailing and sustainable public procurement e.g. school and hospital dinners. Local food should provide essentials, and imports from abroad should only provide luxury foods. There will need to be new waste management systems so that food scraps can be used for conversion into compost, organic fertilisers and biogas fuel (from anaerobic digestion).

Renewable energy

Vegetable and forest gardens must initially be powered by renewable energy from solar, wind, anaerobic digesters and micro hydro; and from biofuels mainly as a secondary option. In Britain this is not promoting the controversial technique of producing first generation biofuels grown from cereals like wheat or maize. There is, however, a place for second generation biofuels from grass / trees grown on marginal land and biodiesel created from waste e.g. chip shop oil. With vegetable and forest gardening it is feasible for all work to be undertaken with human muscles although there is a role for machinery, to reduce human toil, powered without fossil fuels. Market gardeners in the USA have been particularly successful at converting horticultural tractors to run on electricity powered by solar panels. The Farm hack movement in the UK is looking at this issue.

Soil fertility

In industrial farming, soil fertility is maintained with inputs created from fossil fuels (mainly oil and gas) or mining minerals. Our current ways of supplying nitrogen and phosphates are unsustainable, as we reach a state of peak oil and peak phosphates. This is where all the cheap resources have already been extracted and consequently oil and phosphates become very expensive. Vegetable and forest gardens are well placed to be resilient in the face of peak oil and peak phosphates, although if sources of phosphates in the future are derived from recycling waste streams, contaminants will need to be kept separate. The long-term solution will be building fertility through rotating crops, including nitrogen-fixing green manures and recycling nutrients.

More food producers

With less fossil fuel available to power farming machinery, the world will need more farmers in future. In the UK this may equate to 7 million of us, largely as part-time vegetable and fruit growers, which may appeal to younger people or those who work part time. Colin Tudge has called for an “agricultural renaissance”. He argues that unless 20% of the population is connected to the food system we cannot have sustainable societies.

Move towards seed saving of suitable open pollinated varieties

This ensures growers do not need to buy new seeds each year and move towards decentralised processing and distribution

Pre-farming diets: paleo, starchivore and frugivore

Paleo diet is roughly defined as a diet consisting chiefly of meat, fish, fruit, vegetables, nuts and seeds. Paleo excludes dairy, grains and processed food. This diet is often supported by advocates of grass-fed livestock on permanent pasture in both tropical and temperate climates. By extension of the argument, grain-fed livestock like pigs and poultry should be outside this diet.

Starchivore diet is roughly defined as a diet consisting chiefly of cooked grains, pulses and vegetables plus raw vegetables, fruit, nuts and seeds. The starchivore excludes meat, fish, dairy and processed food. This diet is suited to a mix of arable farming, market gardening and forest gardening and is suitable to tropical and temperate climates.

Frugivore diet is roughly defined as a diet consisting of raw fruits, leaves, seeds and nuts from perennial plants. The frugivore excludes meat, fish, dairy, and processed food. This diet is suited to forest gardening in warmer climates.

Paleo. Aside from animal cruelty, the predominant problems with meat-heavy organic paleo is that (1) it is cost prohibitive to the typical family and (2) grass-fed livestock systems are land hungry. For example, a paleo diet in the UK may require twice as much land than is available. However, feeding the entire UK population a starchivore or frugivore diet is technically possible from UK land resources.

Starchivore. The “starchivore hypothesis” is that it is the cooking of grains and tubers (that convert to glucose) is what enabled humans, as a species, to move away from the equator and live in colder climates.
Starch digestion begins in the mouth where it is hydrolysed by the enzyme salivary amylase. Frugivore descendants, eg chimpanzees, with their much stronger jaws, don't have the same evolutionary adaptation. Emerging biological evidence shows early humans began developing extra copies of the amylase gene before we started farming, ie we were starch eaters as hunter-gatherers. Evidence against "the starchivore hypothesis" is concern over gluten intolerance, celiac disease and Irritable Bowel Syndrome (IBS). These conditions are associated with imbalances in gut bacteria and may be explained by the known effects of using highly processed flours (instead of eating the whole grain), lack of sourdough fermentation and action of glyphosate on gut bacteria.
The major sustainability issue with the starchivore approach is that it requires the tilling of land to grow annual crops which globally has led to soil degradation. This can be mitigated using Veganic soil practices such as flowering green manure leys, compost, mulches, chipped branch wood and minimising tillage (on agricultural land grade 1 – 3).

Frugivore. Has the smallest land footprint and uses the least energy. The problem is that when you get away from the equator fruit becomes seasonal and, as a species, humans don't hibernate. Whilst forest gardening in the UK produces the most calories per acre, the fruits are not super sweet and traditionally have been cooked with sugar. It also takes time to establish forest gardens, orchards and nut groves. So therefore, if we wanted the whole of the UK to go frugivore tomorrow it would be impossible. An organic frugivore diet may be cost prohibitive to the typical family. However, forest gardening is an important part of the land use mix to plant more forest gardens on favourable grassland (grade 4) which

would allow rough grazing (grade 5) to be rewilded and/or reforested.
During the last ten thousand years all large, successful human populations have obtained the bulk of their calories from cooked grains or tubers. Globally the starchivore diet is still the most affordable diet.
All references are available in Jenny Hall's new book, Feeding Everyone Crops, (due 2019)

Towards non-violence and social justice

According to www.animalequality.net, over 56 billion farmed animals are killed every year by humans. These shocking figures do not even include fish and other sea creatures whose deaths are so great they are only measured in tonnes.

The second population explosion of domesticated animals outweighs humans 3 to 1, using precious resources of minerals, fuel, soil, air, water and grain. 33% of world arable lands are growing cereals and pulses for livestock (Livestock's Long Shadow, FAO, 2006), with much higher percentages in Western countries (VeganSci 2017). At the same time a child dies every three seconds from malnutrition.

You can choose not to participate in this destruction of life and the eco-system. The fundamental farming and growing principles of the Vegan Organic Network (VON) were established in 1996 by three peace and human rights activists. They declared that the network was a transitional movement that encompassed a dynamic culture based on non-violence, cooperation, social justice and compassion. They identified that there was a growing awareness about climate change and the emissions from animals that contributed to this. This gave added impetus to the growing ethical and ecological vegan movement.
All three had a background in food and farming. They discussed the lack of knowledge amongst vegans: that despite the vegan label on food, few know how food is grown.

The Vegan Organic Network also unambiguously embraces these Articles in relation to people and animals. Declaration of Human Rights

Article 3 of the Declaration of Human Rights states:
Everyone has the right to life, liberty and security of person.

Article 4
No one shall be held in slavery or servitude; slavery and the slave trade shall be prohibited in all their forms.

Article 5
No one shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment.


THE UNIVERSAL DECLARATION OF Human Rights

UNITED NATIONS

Veganic farmers rule out rearing farm animals altogether

VON believes that we can act as a catalyst to bring about agricultural, cultural and social change. Much emphasis is now put upon the evidence that suggests that a wholefood, plant-based diet is healthy. This diet based on wholefood grains, tubers, fruit and vegetables is also the most affordable.

VON considers that vegans are further mentally healthy, because they do not engage with the “disconnect” of loving companion animals but then eating farmed animals. Vegans' refusal to eat meat, fish and dairy is a commitment to active philosophy that considers human and non-human life to be worthy of respect and the right to live in peace and security. VON promotes cruelty free methods of food growing by producing educational videos and leaflets, publishing the magazine Growing Green International, and running stalls at vegan / green fairs, as well as arranging occasional farm visits. There is a website and Facebook group, and an advisory panel that answers queries from commercial farmers and home growers.

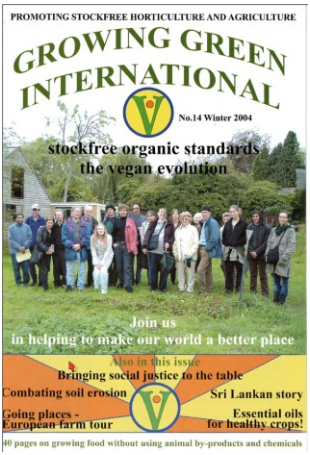
Beef farmers convert to veganic

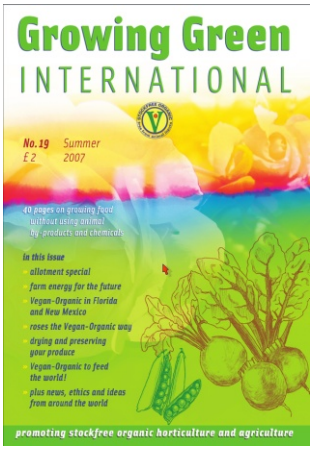
The Vegan Organic Network (VON) and Vegan Society are working with beef farmers who have decided they no longer wish to rear cattle for meat. This story made national news with both the BBC and Countryfile covering the story.
Jay Wilde from Bradley Nook Farm, Derbyshire, sent 63 cattle to Hillside Animal Rescue as he could no longer bear to send them to be killed. Hillside Animal Sanctuary in Norfolk said 30 of the cows were pregnant and all the animals would live out their natural 25 year lifespan.

The farm was inherited when it was dairy, but in order to obtain milk the calves were separated from their mothers. As a vegetarian, Jay found this separation distressing for the cows and calves and a contradiction of his ethics. The change to beef farming did not alter this contradiction and so a movement to Veganic was felt to be their only choice.
Under the advice of leading organic grower Iain Tolhurst, Bradley Nook Farm is now converting to become a Veganic market garden as the land is suitable for cultivation of annual crops.

Even on non-arable land (excluding rough grazing – grade 5) agroforestry, using perennial crops and orchards, can prove more profitable long-term. Rough grazing is better for forestry and rewilding.

Why not join The Vegan Organic Network and you will receive twice yearly a copy of our magazine Growing Green International along with free access to over 20 years of back issues. Go to tinyurl.com/vonju to join.





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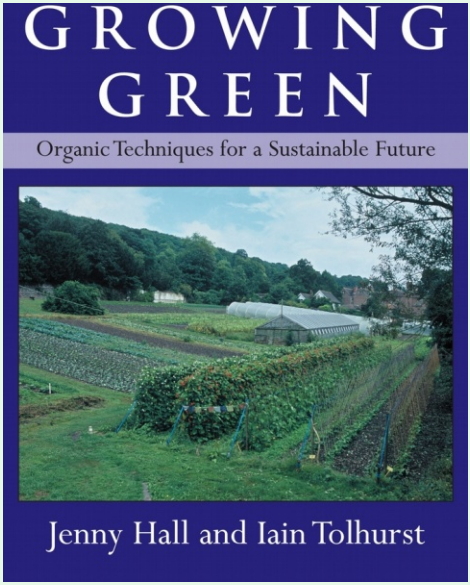
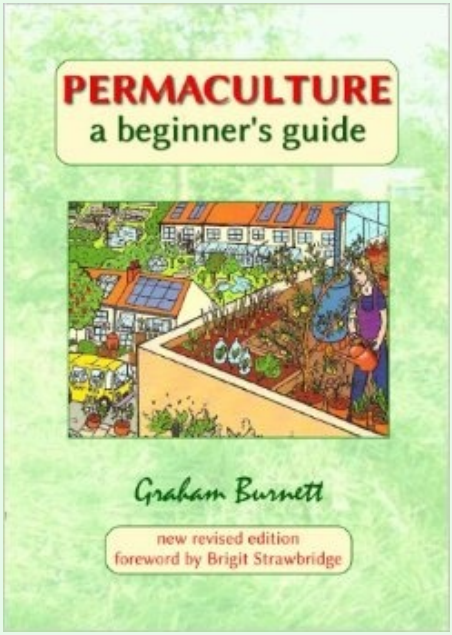
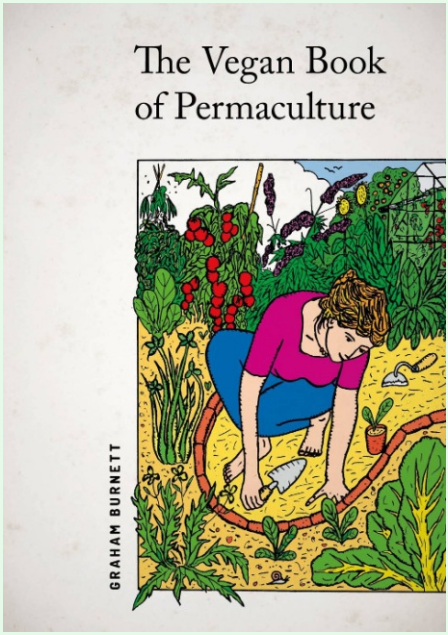
For further information on growing veganically please see our range of books, and visit our website or Facebook group for any questions you may have. Website veganorganic.net/ or Facebook group tinyurl.com/VONFB







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