

NEW BIOSPHERE AGRICULTURE



TECHNOLOGY & PRODUCT INFORMATION



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NEW BIOSPHERE AGRICULTUE is a demonstration of capabilities in agriculture for others to emulate:

All phases of agriculture are organic in application.

All phases of soil management enhance the living nature and enduring quality of the soil.

All phases of water utilisation result in purer water and higher utilisation then ever envisaged.

All phases of power employment reduce atmospheric pollution.

All phases of site management lift the square metre yield to higher levels.

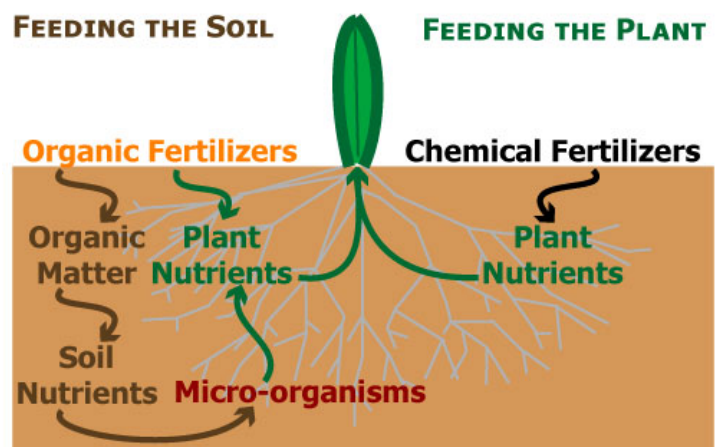
Unique technology employs:

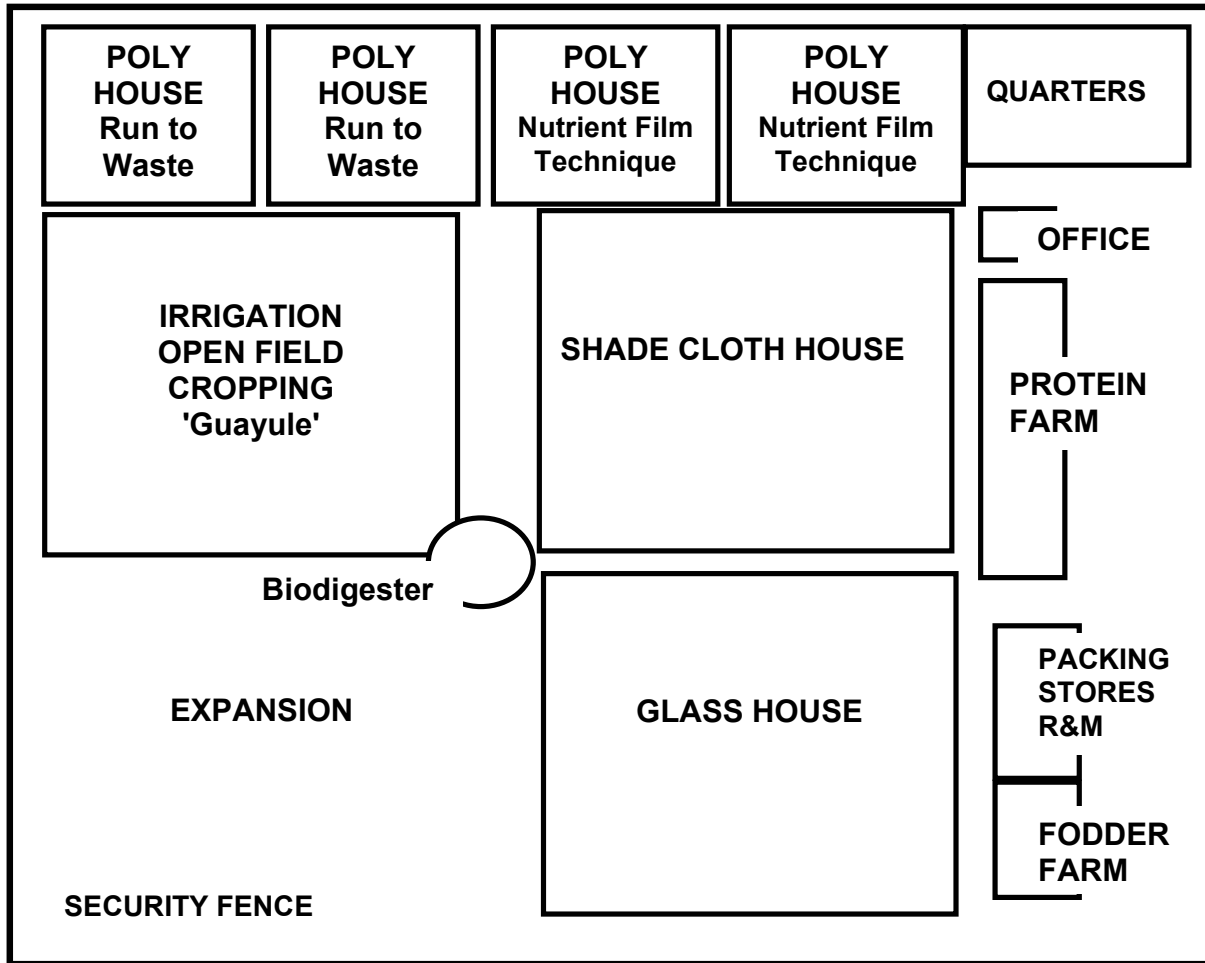
- **Electronically induced organic food in an environment where the oxygen, ions in the air, temperature, humidity, sunlight, water mist are all controlled.**
- **Aquaculture technology extends into hydroponic technology with aquaponics.**
- **Food production encompasses all small to medium crops.**
- **Water purification from source as well as recirculation creates efficient employment.**
- **Renewable power sources such as hydrogen and Zero Power based technology.**
- **Controlled atmosphere enables yields at exceptional levels per square metre and litre of water.**

All phases of New Biosphere Agricultural Management (CREAM) empower others to replicate elements or the whole concept as they so please.

Center for Resource Education and Agricultural Management (CREAM) is the dissemination platform developed by **MUBEEN**, an initiative of Dr L Dawud (David) Said, for the training and assisting of all who wish to avail themselves of what is possible within the global application of agriculture as it should be.

MUBEEN = That which makes things clear, evident and manifest.



MODULE being base structure for NEW BIOSPHERE AGRICULTURE TECHNOLOGY:**SITE LAYOUT**

	metres	metres	AREA	
	Width	Length		
PROTEIN FARM	18	80	1,440	Metres ²
GLASS HOUSE	100	100	10,000	
POLY HOUSE	48	50	2,400	NFT [Nutrient Film Technique]
POLY HOUSE	48	50	2,400	NFT [Nutrient Film Technique]
POLY HOUSE	48	50	2,400	Run-to-Waste
POLY HOUSE	48	50	2,400	Run-to-Waste
SHADE CLOTH HOUSE	100	100	10,000	
IRRIGATION	100	100	10,000	
FODDER FARM	16	26	416	
HOUSE / QUARTERS	40	40	1,600	
OFFICE	150	10	150	
STORES / PACKING / MAINTENANCE	20	40	800	
LAND AREA required	300	300		9.00 hectares



NEW BIOSPHERE AGRICULTURE - PRODUCTION CAPACITY of MODULE

kilograms per annum

PROTEIN FARM			95,709 kg
HYDROPONIC FARM	Tonnes		3,168,000 kg
FODDER FARM	3,500	converts to meat of	568,750 kg

41,480	m ² of production area	3,832,459	kilograms of farm gate food
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MINI BIOM	18,000	people feed from	4.15	hectares
	4,339	people feed from	1.00	hectare

say	5,000	people feed from	1.00	hectare
say	2,000	people feed from	1.00	acre

MAXI BIOM	food for people		all from an area of
Consider	100,000,000	= 50% utilisation of	100,000 acres
20	kilometres x	20 kilometres =	100,000 acres
12	miles x	12 miles =	100,000 acres

WHAT IS SPECIAL ABOUT THIS BUSINESS?

The growing environment significantly influences the success of hydroponic and aquaculture systems. Attention to the variables will influence growers' yield. By monitoring the inhouse eco system of the applied biosphere technology within the mini biom incorporating:

temperature	humidity	CO ₂ levels
negative ions	harmonics	oxygen
sunlight	fogging	water quality
nutrients	air quality	etc.

the grower can control the effects of these variables on the system to deliver optimums.

NBA ENVIRONMENT for HIGHER PRODUCTIVITY:

Most plants and fish grow well between 20°C - 28°C; aim for a temperature in the middle of this range (ideally 24°C - 25°C). **Temperature** is controlled within these limits in all structures.

Humidity of 50%, or as required, for normal plant growing, is maintained.

Plants use **carbon dioxide (CO₂)** in order to maintain growth. 300-350ppm is regarded as the minimum requirement for good plant growth.

Negatively charged ions have been proven to have positive effects on plant growth.

Timed pulsed frequency at required **harmonic** levels opens and closes the plants stomata enabling enhanced feeding as and when required. Inputs are drawn into the plant when stomata are open.

Oxygen ionised atmospheres containing approximately 10,000 positive or negative charged ions/cm³ increased the rate of growth by as much as 50% (as measured by integral elongation or weight) without altering the protein, sugar, or chlorophyll content of the plant.

Glass house structures for aquaponics and hydronics deliver maximum and constant **sunlight** transmission. No other medium transmits a better light spectrum for photosynthesis.

Fogging enables the frequent distribution of nutrients as a fine mist for uptake in a relative humid atmosphere.

Water quality monitoring and control being maintained throughout all delivery avenues.

Advanced technology being employed for the delivery of **nutrients** for aquaculture and hydroponics.

Controlling a crop's environment to target optimum plant growth accounts for 90% of yield.

NBA Advantages with Hydroponics

1. Hydroponics makes it possible to grow plants in locations where it would not normally be possible, e.g. poor soil, rocky areas, even balconies. With the use of artificial lighting, it is even possible to successfully garden in a spare room or garage.
2. Less labour is required than growing in soil because no digging or weeding is required.
3. Nutrients and moisture are fully accessible in a hydroponic system; since plants do not need to compete for nutrients, more can be grown in a smaller area.
4. The increased control over growing conditions makes it easier to provide the best possible environment for plants, leading to better quality produce and higher yields.
5. Fast growing, healthy plants grown by hydroponic methods are more resistant to pests and diseases. You will also notice improved flavour and texture in hydroponically grown fruits and vegetables.

With many plants, hydroponics will give you a higher quality plant, at a higher yield.

NBA Employed Unique Technologies

Aquatic operators in USA and Australia achieve 100% feed to fish weight conversion whilst within high intensity aquaculture operations employing as little as a gallon of water to deliver a pound of fish (8 litres of water for 1 kilogram fish).

All nutrient enriched water removed from the fish farm is employed in hydroponic production. The system can produce from 45 to 70 pounds of produce for every 1 pound of tilapia fish produced.

OPEN ALL functions as a soil revitaliser and conditioner. It is an electrolyte containing 8 essential elements, 7 micronutrients, and 63 trace elements, and augmented with certain living amino acid chains. **OPEN ALL** improves chemical and physical properties of soil, permitting excellent water percolation by molecular attraction which allows water to move freely and uniformly down into the soil. Thus, plants will get the required nutrients from the soil and will normally save 50% in water use along with 50% in fertilizing requirements.

AQUATRONICS™ pond treatment will change the conditions in any pond and provide the environmental conditions necessary to enhance and accelerate the natural processes and aid the laws of nature.

EFFECTIVE MICROORGANISMS or EM is a mixed culture of beneficial microorganisms (primarily photosynthetic and lactic acid bacteria, yeast, actinomycetes, fermenting fungi) that can be applied as an inoculant to increase the microbial diversity of soils. This in turn, can improve soil quality and health, which enhances the growth, yield, and quality of crops.

PROTEIN FERTILIZER'S proven techno-organic technology over a 12 year period has demonstrated that:

- Small crop yields have been lifted by typically 50% when compared to the outcome from using traditional chemical fertilizers.
- Large crop yields have also been lifted by typically 50%.
- Shelf life of small crops has been extended by an average of two weeks.
- Soil amelioration is a long term benefit from using the Protein Fertilizer technology.
- Inputs required progressively reduce to about 50% of the initial load around year four.
- Costs to the user of the technology are significantly lower than from using chemical fertilizers.
- The need to apply pesticides is substantially reduced. Protein Fertilizer have available organically based proven pesticides.

SONIC BLOOM system has resulted in giant, enormously healthy plants which are sturdier, of much higher nutritional value, and better taste. Some of the effects include the following:

- 40% larger seeds and improved 'crumb structure' of the soil (resulting in increased earthworm activity and bioturbation).
- Much longer taproots and/or greater, heavier root mass.
- Much longer vines (e.g., the normally 18-inch purple passion plant growing to a Guinness world-record length of 1,400 feet in just 2-1/2 years!).
- Plants becoming a lighter, brighter green.
- Leaves swelling, some standing erect.
- Fruit becoming much more disease- and insect-resistant.
- Ever blooming trees.
- Crops maturing much faster and producing 20%-100% greater yields (with reports of 15'-tall tomato plants with 836 tomatoes and 16'-tall corn stalks with 2' ears!)

VERTICAL ROTATING GROWING SYSTEM rotates 24 hours a day, with the flow of water that can be regulated by a small motor. Suitable for growing general vegetables, such as ice berg lettuces, fancy lettuce, strawberries, herbs, tomatoes to name a few.

Fruit and Vegetables	Traditional hydroponics - average per sq mt.	Rotating Growing System Hydroponics - average per sq mt	Percentage Increase	Increases in kilos per sq mt.
Strawberries	5 kilos	92 kilos	1,740%	87 kilos
Ice Berg Lettuce	72 kilos	482 kilos	570%	410 kilos
Tomatoes	45 kilos	180 kilos	300%	135 kilos

Continuous supply of **FRESH FODDER** in a growth chamber. Advantages of the system include its independence on external growing conditions for plants; it can be set up where the feed is required; and maintaining uniformity, and quality of the product all year round.

The *Fodder Farm* system enables an area of around 400 square metres of industrial building to grow an average of 10 tonne of plant products per day; equivalent to the lucerne produced from 300 hectares of prime irrigated agricultural land. It uses less than 4,000 litres of water per tonne of production, compared to an average of around 80,000 litres of irrigation water per equivalent weight of lucerne.

NEW BIOSPHERE AGRICULTURE is truly a universal power house of organic food supply!

CAPABILITIES:

Fish, vegetables, fruit and food supplements for animals results in a NBA mini biom delivering fresh continually throughout the year, nutrition to support:

5,000	people can be fed from	1.00	hectare
2,000	people can be fed from	1.00	acre

EXPANDED CAPABILITIES:

say	5,000	can be fed from	1.00	hectare
say	2,000	can be fed from	1.00	acre

Consider	100,000,000	= 50% utilisation of	100,000	acres
20	kilometres x	20 kilometres =	100,000	acres
12	miles x	12 miles =	100,000	acres

GLOBAL AQUATICS high intensity aquaculture: (not to be included)



The 32 tank configuration has an annual production capacity of 211,000 pounds (46,500 kilograms). A 32 tank configuration using our S-99 "Steel Core" 3200 gallon (12,000 litres) tanks, for instance, consists of 8 quadrants consisting of four tanks each. An S-92 system can be made up of a few as four tanks or in multiples of four for expansion. When all building costs are taken into consideration such as; fixed cost for computers, operating personnel, building, well, etc., the 32 tank configuration is the smallest size that can be used for maximum return on investment.

Internal Water Quality-

Perhaps one of the finest features of the S-92 is its patented "Sequential Flow" operation. This design is the heart of its operation and one of the reasons that it has had such a fine success rate in high density production. Instead of each tank having its own limited water cleansing equipment, the S-92 utilizes a fundamental principle that has been around for centuries in the form of centralized municipal/centralized water treatment plants. That is, one massive treatment plant for all of the tanks. This gives each tank as an individual the redundancy of the entire system. In a production system that utilizes cleansing equipment for each individual tank, the volume of water in the tank is greater than that in the cleaning unit. So, if the water in the tank becomes toxic to the fish, the entire system becomes toxic, usually resulting in the lose of the fish in that particular tank. With the S-92 system, each tank is just one part of the entire system with its water being replaced every four hours with

cleansed water from the water treatment unit (hydroponic filtration). In the event one tank should experience water quality problems, it can be quickly flushed back to the treatment unit and the water replaced simultaneously. Because of this feature, no limitations are placed on the operators as to how much feed to dispense in regards to the system's capacity to handle it-- the fish can be fed all they can eat.



Polyculture-

One more advantage of the "Sequential" operation of the S-92 system is its enhanced ability to operate a true polyculture system while keeping the different species in separate tanks. Polyculture (the growing of many different species at the same time), has long been known as a very effective way to increase the efficiency of fish production. The main problem with most systems has been that in order to achieve this, the fish could only be grown together in the same tank. This is not really practical for the most part, because some species do not tolerate other species of fish. This creates a stressful, unproductive environment. Also, for the most part, the practice of polyculture usually calls for the lower order of fish to be of a smaller size than the higher order. When the two are mixed together, quite often the higher order will cannibalize the smaller ones. In the S-92 system, we do not have this problem, because the two species are in different tanks and the effluent water from the higher order of fish flows into the tanks containing the lower order, carrying the excess nutrients with it.

Efficiency-

There are several factors which can make any fish culture system inefficient to operate. Many times intensive systems will do a great job growing fish, but they are unprofitable because it costs too much per pound to raise them. Here again these concerns were taken into consideration when designing the S-92. One of the factors that has to be considered is the amount of electric power that it takes to run a system. In the S-92 we were able to eliminate an enormous number of pumps. In a normal system where each tank has its own cleaning unit it takes two pumps per tank, one to send the water through the biofilter and one to return the water to the tank and create circulation. With a combination of sequential and gravity flow, the S-92-42 tank configuration uses only 10 pumps to operate the system. One main drive to supply water from the filtration unit, one biofilter pump, and one injector pump per

four tanks. Another cost saving feature is the system's no-net loss of dissolved oxygen. With the S-92, any surplus oxygen that is in the effluent when it leaves one tank quadrant is transferred to the next quadrant. This is particularly beneficial when operating in a polyculture mode. By running a higher order of fish in the front quadrants that need perhaps 8 ppm of oxygen, when the effluent flows to the next quadrant where the lower order needs perhaps only 6 ppm, quite often little or no oxygen needs to be added to support fish these fish.

Computerized Monitoring-

One of the most important goals for any operator of an aquaculture system is to maintain absolute control of the system. Loss of control of any of the critical environmental parameters necessary to maintain a healthy fish environment can be devastating. It is not a question of whether conditions will from time to time deteriorate, but when, and how can these adverse conditions be predicted or spotted and corrected in a timely manner before the fish begin to suffer the consequences. The computerized package developed by Aquatic Technologies is included in the S-92 aquaculture system. The program is designed to perform, any functions for the operator simultaneously and thus allows him peace of mind. One of its features is to record each individual tanks condition every fifteen minutes. This data includes oxygen levels and temperature, and can include ph and water flows. The computer has the ability to recognize changes in the environmental condition and will automatically correct them. Should a condition arise that is caused by some equipment failure, the system will locate the problem, alert the operator, and identify the source of the problem. For operators and system owners who are working in a vertical integration type operation, an additional program can be installed in conjunction with the monitoring system which will keep track of the individual tank's bio-mass and keep the operator and the processor informed on a day to day basis as to how the fish are growing, when to expect harvest, and what harvest weight to expect.

Expansion Capabilities-

The S-92 has been designed as a modular system, made up of quadrants which consist of four tanks each. A 42 tank configuration using our S-99 "Steel Core" 3200 gallon (12,000 litres) tanks, for instance, consists of 10 quadrants consisting of four tanks each. An S-92 system can be made up of a few as four tanks or in multiples of four for expansion. We have determined that when all building costs are taken into consideration such as; fixed cost for computers, operating personnel, building, well, etc., the 42 tank configuration is the smallest size that can be used for maximum return on investment. The 42 tank configuration has an annual production capacity of 211,000 pounds (46,500 kilograms). Should an operator decide in the very beginning that he wants a higher production rate, additional tanks can be added to the unit without any redesign work. However, depending on the number of additional tanks added, it may be that additional filtration must be added to accommodate them. Each additional tank will add 5,000 pounds (2,268 kilograms) of production per annum.



Recently there has been a lot of news about how the introduction and use of certain Micro-organisms can be helpful in an intensive aquaculture system. We at Global Aquatics are scratching our heads wondering why all of these researchers are claiming to have suddenly "Discovered" this amazing fact. First developed at our R&D facility over ten years ago and since then greatly refined, our natural hydroponic clarifiers have proven to be the best way to not only remove suspended solids from the culture water, but also aid in the de-nitrification process to remove ammonia and nitrates through the natural accumulation of micro-organisms. This system is as close to following the natural process of water purification that one can get. As a result almost all of the water in a recirculation system can be used over and over again with just marginal replacement required from the daily flushing of the system to remove trapped solids.

This system is extremely efficient since it works entirely on gravity and uses no pumping and no mechanical filters of any kind. Daily flushing of the system is no more effort that the removal of a stopper from a bath tub. The solids go to a waste holding area and then are pumped from there to either the putrefaction tanks to be digested into aquaponic crop production or to other discharge places.



Utilizing design features built into the S-92 system for the digestion of organic fish waste and then the transfer into special growing trays, plants thrive even through cold winter months. Because the process uses organic waste and the amount of moisture delivered to plants closely emulates that found in nature, crops such as these tomatoes will not have the watery, tasteless form found in most "PURE" hydroponic growing operations where the nutrient is derived from chemical fertilizers and the roots are totally immerse in water.

In a fish culture system we have waste in two forms. First we have discharged water. This water in itself already contains a lot of nutrients and small solid particulate. The other form of waste is solid matter. Either of these two turned loose in a river or lake will cause a problem. They can be sprayed on a field and they will break down much faster than normal farm animal manure because of the fact that it is already very wet and there are bacteria working on it when discharged. However, this is still not the final form for plant food. At *Global Aquatics* we have incorporated in all of our S-92 fish systems devices to totally digest the solids by means of an aerobic digester vessel and then coupled that to special plants production trays. The nutrients are then delivered to plants by a timed pump. Unlike Hydroponics, our plants are not growing in standing water, but rather in porous media which traps the nutrients around the plant roots.



Glass house structures for aquaponics and hydroponics deliver:

- Maximum and constant light transmission.
- No other medium transmits a better light spectrum for photosynthesis.
- Glass does not deteriorate over time.
- Thermal efficiency – minimum energy loss or waste.
- Glass ensures minimum condensation challenges.
- Glass is non-flammable.





"HYDROPONICS" is the growing of plants in systems isolated from the soil, and fed with the total water and nutrients required. Systems can be either recirculating or non-recirculating and do not necessarily use a growing medium. Another, perhaps better term is soilless culture.

Why Hydroponics?

Here are some of the possible benefits that may be gained by growing a commercial crop hydroponically, rather than in soil:

- Crop yields are usually slightly higher than those obtained in good soil used in the same environment. This can be financially significant.
- Faster crop turnaround can give further increases in yield and perhaps extend cropping into higher priced periods.
- Produce can also have a better vase or shelf life.
- The soil may be unsuitable, or poorer, cheaper land can be used.
- Water usage can be much lower than with most soil growing.
- Fertilizer usage can be much lower than with soil growing.
- Under hot conditions the better water availability to roots can reduce water stress on plants, giving better yields and longer plant life.
- For crops vulnerable to soil diseases, crippling losses can be substantially reduced or eliminated.
- Some crops, such as lettuce and strawberries, can be lifted from ground level to a much better height for planting, cultivation and harvesting. This gives much better working conditions and hence lower labour costs.
- Some systems require less work in setting up and planting than growing in soil.
- Weeds can be substantially reduced or eliminated.

What is NFT Hydroponics ?



NFT [Nutrient Film Technique] Hydroponics is a method of growing plants indoors in a nutrient-rich water solution totally free from any material-based growing medium such as peat moss, gravel, or perlite. This allows selected crops to be grown at a much faster rate and with exceptionally better quality than could be done indoors in peat bags or soil or outdoors in soil.

It is very difficult and expensive to maintain Optimum Nutrient Growth Variables in any material-based growing medium (soil) because:

1. Un-even evaporation will result in nutrient toxicity or deficiency resulting in poorer quality plants and harvests.
2. Fungus, bacteria, virus, and pests are difficult to impossible to control without expensive and unhealthy pesticides.
3. Removing and disposal of spent medium between crops is messy, heavy, time consuming, and expensive.

How to Spot Healthy Hydroponic Plants:

A good Grower/ Supervisor will produce healthy and bountiful hydroponics crops. Knowing the visual characteristics of a good crop (even from a photograph) is a necessary first-step for assessing a grower's abilities. A grower's crop photographs will indicate how much of the Science of Modern Hydroponics they have mastered. But, first we must understand some basic principles or laws of plant growth:

Plants (like all living things) have a Primal "Instinct" or "Urge" or "Directive" to Procreate themselves. Once a plant has sprouted, it MUST produce at least one seed (or a runner) in order to Procreate; and it will channel ALL of its energy towards this goal.

Plants absorb dissolved nutrients into their roots. Plants only "eat" (diffuse through a semi-permeable root membrane) certain dissolved salts and metals; and they DO NOT "eat" dead plants or bugs (humus), like most people believe. Bacteria and water break down dead plants and bugs into dissolved salts and metals, which is ONLY what plant roots absorb - including ALL plants that grow in soil.

Simply, plants then "pump" (osmose) absorbed nutrient solutions from their roots, through their stems, and into their leaves. It is still mostly unknown how the chlorophyll in their leaves, using light and absorbed carbon dioxide from the air, chemically "react" with the nutrient solutions from the roots to produce "plant food" or sap. This sap or "chemical energy" is immediately pumped to the plants Terminal Growth, feeding the production of flowers, then fruit, then new seeds. Thus, the cycle is complete.

IMPORTANT: A toxic or deficient nutrient solution surrounding a plant's roots (or a lack of light or CO₂) will cause its absorbed nutrients to become "unbalanced" and stunt its growth. Thus, its leaves will not be able to produce enough sap "energy" for a totally complete plant.

To assure that it produces a seed, a plant will convert or "suck" the energy out of its older leaves (Seed Leaves or First Growth) and channel their energy up into its flowers and fruit (new seeds). As a result, the plants older leaves (and often the biggest) will yellow and then die, dry up, and fall off. The plant loses its energy generating capabilities, and suffers a loss of Potential Productivity. Pictures of mature hydroponics plants (3 to 4 months old) with a length of leafless, bare stems coming out of their NFT Tubes is a sign of a lack of Optimum Growth Variables.

Over the last twenty-five years, we have toured many new hydroponics operations that failed because of poor Nutrient Formulations (not to mention faulty growing systems). In Canada, millions of dollars have been lost, and even provincial governments have crumbled, because investors could not properly assess claimed Grower Capabilities.

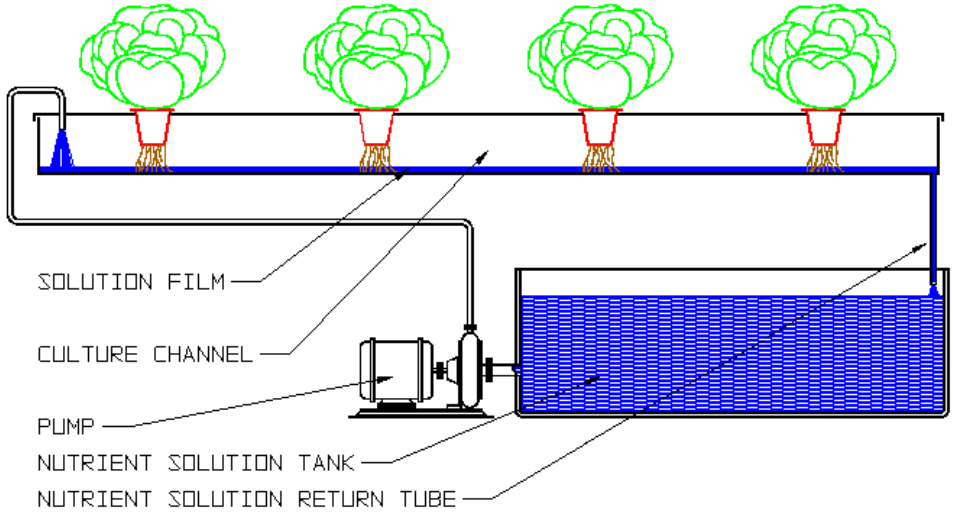
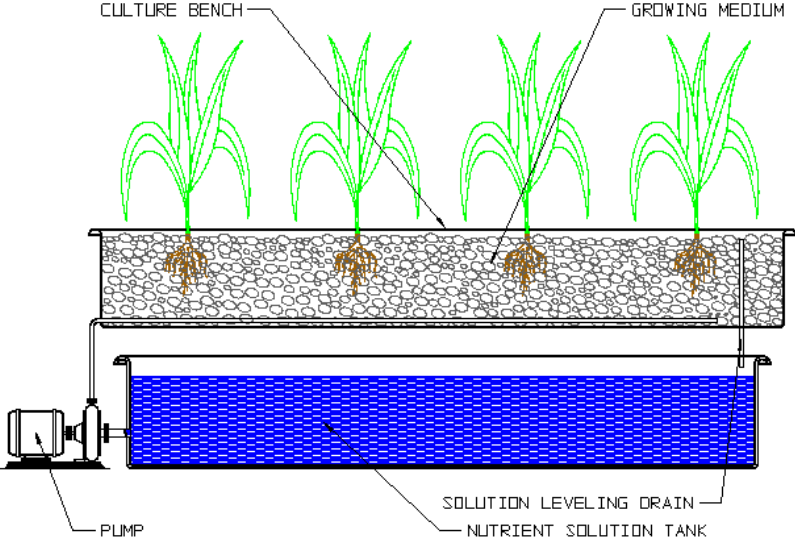


Exposed for maximum growth and colour.

'Progaganda Gardening' at Incredible Edible Todmorden

<http://www.permaculture.co.uk/videos/progaganda-gardening-incredible-edible-todmorden>

Covered for protection from the harsh midday sun.



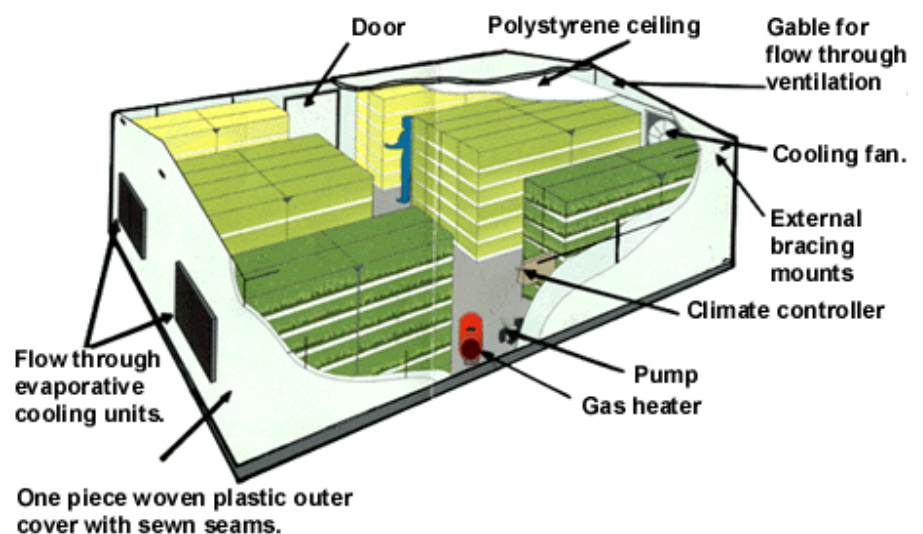


Simple Sheds deliver a very interesting design, with a very strong but lightweight truss that is screwed together on site. Again, posts and gutters are of cold rollform material and the gutter height is four metres. Each truss is capable of supporting 25 kg of crop per square metre. The ridge vents are quite large, covering over 40% of the floor area in motorised, opening roof vents. These of course are controlled by the Gavish Control System. Simple Sheds have achieved a 15 deg C temperature differential with this house. That is, on a day with an ambient temperature of 45°C, the greenhouse was only 30°C inside. This is a very good result, which few greenhouse builders can achieve.

It is brought about by innovative design and the right combination of materials. It is a turnkey business for all crops grown in greenhouses and is the premier builder of this sort of project in Australia.

FODDER FARM

A fodder farm is a very versatile and intensive hydroponic growing unit, in which seed, such as barley or oats, is germinated and fed an intensive and carefully monitored hydroponic solution. This will produce a "grass" approximately 250mm high after seven or eight days, at which point it is removed from the growing area and fed to stock. The



empty area is reloaded with grain to be ready again at the end of the cycle. The grass is highly nutritious and is readily eaten (roots and all) and digested almost completely by both beef and dairy cattle, sheep, deer, etc. The weight gains recorded from using this high protein green fodder, in conjunction with some dry matter, far exceed those when the diet is not supplemented by this method. Fodder producing units manufactured by this company are suitable for both drought backup food supplies and "finishing" of high value stock for market. However, the investment in one of these units should be maximised by using it all year. It becomes your own, on farm, high value feed producing unit. Why cart stock many miles in search of better conditions when you can produce them yourself? These units can also be the difference between an operation on marginal land succeeding where it might be expected to fail. In one area of Victoria for instance, dairy cattle are physically moved off the property for a part of every year as there is a need to rest pasture. An onsite fodder farm would stop this migration (apart from increasing milk production and butterfat levels during lactation) and allow for year round production. One of the primary advantages is the fact that a unit can be run at any percentage of full production to suit the situation, or even be shut down if production is not necessary. If fodder is required the unit can be started from zero and be in full production in only eight days. Alternatively, if fodder is not required immediately the unit can be kept running and the output turned into silage to be stored for more difficult times or sold for cash. Vacuum packing of the turfs is another area some wily entrepreneurs are exploring. We make no recommendations or claims in this area as wet, ungerminated seed will always be present to a small degree and this tends to ferment. Indeed it is this ungerminated seed which causes the sliminess and foul smells when the crop is grown in plastic trays. We do believe all the possibilities are worth exploring, e.g drying, compressing, packing etc etc.

Another important factor to consider is the fact that this is a completely natural product. With consumer uneasiness growing about the methods used to produce their food there is a way to get results without hormones and synthetic growth stimulants. The organic (using the term in the all encompassing way) market is growing rapidly and those that have alternatives in place can already command a premium for their product. We can modify the feed system to use accepted organic fertilisers if required. A niche market could be developed for meat produced by this food. After all, look at all the wheat grass bars popping up around the place!

Fodder Farm washed down ready to go.



Analysis performed	Unit	Result
Protein	%	16.5
Ether extract	%	3.4
Moisture	%	84
Ash	%	3.6
Crude fibre	%	15.2
Acid detergent fibre	%	19
Nitrogen free extract	%	61.3
Metabolisable energy	MJ/Kg	11.4
Vitamin B1	mg/100g	.2
Vitamin B1	mg/100g	.1
Vitamin B1	mg/100g	4
Vitamin B1	mg/100g	.2
Calcium	mg/Kg	150
Copper	mg/Kg	1.3
Iron	mg/Kg	7.2
Potassium	mg/Kg	180
Magnesium	mg/Kg	150
Manganese	mg/Kg	2.3
Sodium	mg/Kg	36
Phosphorous	mg/Kg	150
Zinc	mg/Kg	4.6

- **Fodder Farms** will 'finish' your stock nicely;
- **Fodder Farms** will 'drought proof' your property;
- **Fodder Farms** help you take the gamble out of farming;
- **Fodder Farms** enable you to increase your stock carrying capacity;
- **Fodder Farms** produce you more feed and save you time and money; and
- **Fodder Farms** produce fodder for you every day, regardless of weather conditions;



An independent study of hydroponic fodder production was made by Prof. C.A. Arano of Buenos Aires through the 1970's and 80's. The following is drawn from his published results: "Each kilogram of fodder is equivalent nutritionally to 3kgs of lucerne."

In a test of milk production with a diet of fodder versus one of normal feeds such as grain, hay or silage, the group of 60 cows on a fodder diet increased their milk production by 10.07% over the control group. In addition, the group fed on fodder produced a butter-fat content of 14.26% higher than those fed on a regular diet.

Racehorses fed on fodder performed better and zoo animals which are accustomed to a grass diet in their natural habitat were healthier in confinement when fed fresh fodder all year round."

Components	Unit	Result
Dry matter	%	12.30
Crude protein	%	20.90
Adjusted crude protein	%	36.00
Rumen degradable protein	%	63.00
Rumen undegradable protein	%	37.00
Acid detergent fibre	%	20.80
Neutral detergent fibre	%	40.00
Crude fat	%	4.8
NSC	%	34.60
ME Lactation	Mj/kg	11.89
ME Maintenance	Mj/kg	12.04
ME Growth	Mj/kg	7.73
Calcium	%	.21
Phosphorus	%	.53
Magnesium	%	.21
Potassium	%	.68
Sodium	%	.09
Sulphur	%	.18
Iron	PPM	102.00
Zinc	PPM	141.00
Copper	PPM	9.00
Manganese	PPM	26.00
Molybdenum	PPM	1.50
Chloride Ion	%	.24
Ash	%	3.68
Protein equivalent -Urea	%	.13
Protein equivalent - Ammonia	%	.28
Nitrate Ion	%	.02



PROTEIN FERTILIZER'S proven technology over a 12 year period has demonstrated that:

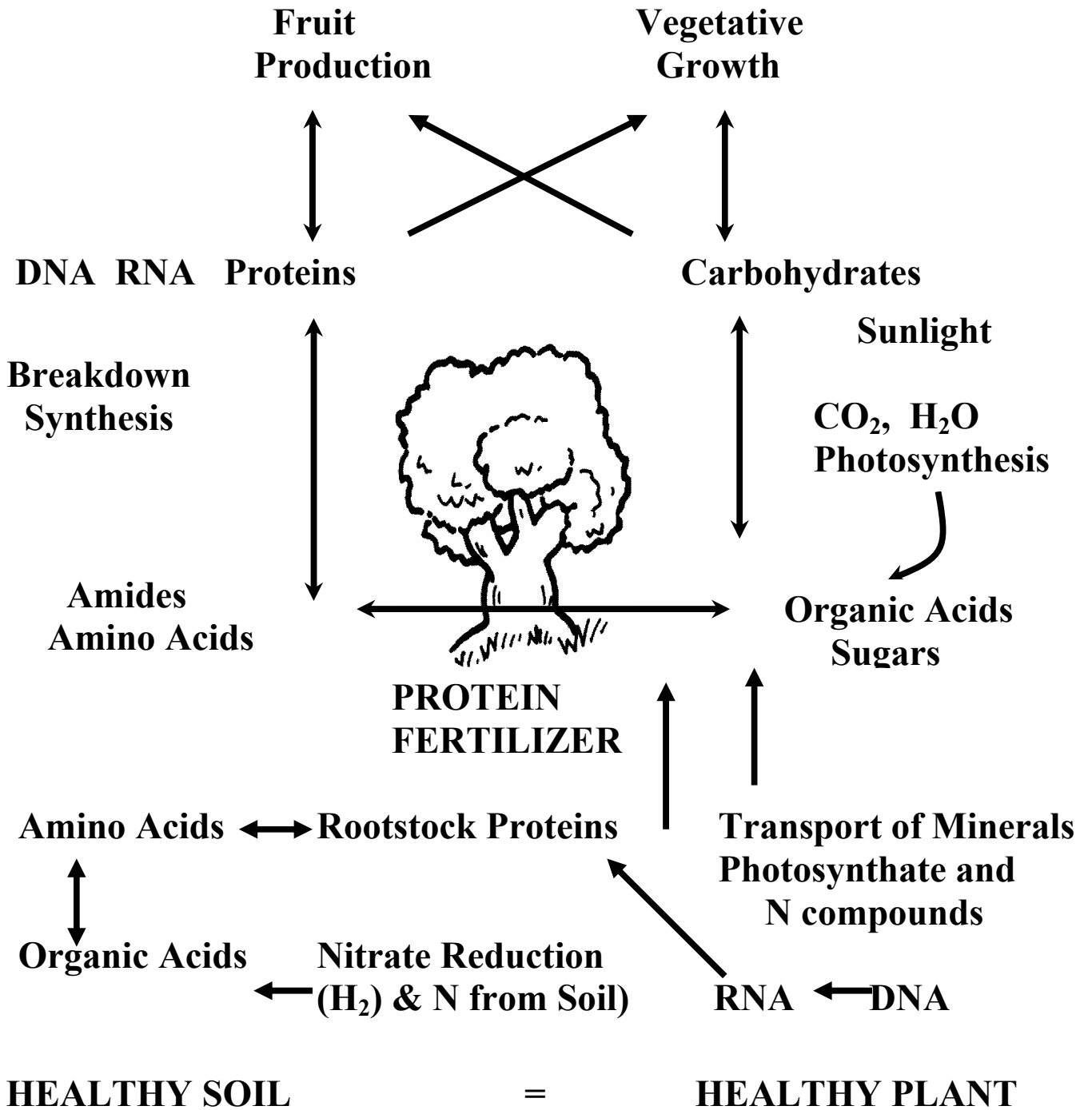
- Small crop yields have been lifted by typically 50% when compared to the outcome from using traditional chemical fertilizers.**
- Large crop yields have also been lifted by typically 50%.**
- Shelf life of small crops has been extended by an average of two weeks.**
- Soil amelioration is a long term benefit from using the Protein Fertilizer technology.**
- Costs to the user of the technology are significantly lower than from using chemical fertilizers.**
- The need to apply pesticides is substantially reduced. Protein Fertilizer have available organically based proven pesticides.**





GROW GREEN

T E C H N O - O R G A N I C S



ENERGY in PLANT stored as CARBOHYDRATE

HIGH CARBOHYDRATE content = HIGH BRUX (SUGAR) reading

PROTEIN FERTILIZER Pty Ltd

Incorporating "GROW GREEN" Technologies

PROTEIN BASED with MINERAL INPUTS processed via PROPRIETARY TECHNOLOGY achieves proven HIGH PERFORMANCE inputs for AGRICULTURE and HORTICULTURE production – all environmentally friendly.

- ✓ Crop yields lift by 50%.
- ✓ Costs of inputs to farmer no higher.
- ✓ Soil amelioration progressively reduces required annual inputs.
- ✓ All production raw materials readily available – typically waste material.
- ✓ Cost of raw materials attractive.
- ✓ Attractive sustainable gross margins.
- ✓ Comparatively low capital investment.
- ✓ Very large market for products.
- ✓ Product range attractive & increasing.
- ✓ Strong support for product concept from Government agencies, environmentalists and consumers.
- ✓ Demand for product type increasing.
- ✓ Technology commercially sound and at the leading edge (globally).
- ✓ Commercial sales proceeding strongly.
- ✓ Strong interest re technology licensing and joint ventures internationally.

Product Research & Development leads to further NEW PRODUCTS

Product Research & Development leads to further NEW APPLICATIONS

**Resulting in
SUBSTANTIAL and QUICK return on investment
RAPID international commercialisation
UNIQUE leading edge protected intellectual property**

- ⇒ This technology is the way of the future!
- ⇒ “GROW GREEN ... “NATURALLY”



NEW BIOSPHERE AGRICULTURE brings all these technologies together to deliver a new sustainable environment with richness and quality in all food produce for all.