

## BIODYNAMIC LANDSCAPE DESIGNING WITH BIOPONICS for Green Building Projects and Roof Top Gardens

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### Author's Background

Pawan innovated Bioponics and is an urban landscapist. He integrates *Vastu* (Geomancy), Biodynamic, Bioenergetics and Homeopathy. His current research is on developing new techniques, applied homeopathy and studying Bioenergetics in landscaping and agriculture. Promotes non toxic cultivation.

Archana a Gold Medallist in Dietetics designs Bioponic\* kitchen gardens. She advocates growing nutritional food at home. She is consultant to day boarding schools.

### Summary

*Never before the subject of Landscaping is covered in any of the past IFOAM Conferences. BIODYNAMIC Landscape Garden Designing is a new approach for Urban Landscaping where purposeful plantations are carried out, incorporating the sciences of Biodynamic agriculture and BIOENERGETICS (measuring the electro-magnetic energies from Plants, trees, and Earth) which are useful and suitable for making Therapeutic (Healing) Gardens, Health Care institutes, Residential Complexes, Educational Institutions, Public Gardens, etc. The conventional approach is to follow the chemical methods, but the innovative BIOPONIC (hybrid between Hydroponic and Biological science) technique replace soil, (reducing wet weight by more than 50%), especially for making roof top gardens, in towns and cities or making of urban landscape gardens.. Almost everything could be grown with Bioponic. It's a new direction for the Landscape Architects and Garden Contractors to design and make Urban Landscapes.*

### Background

While almost all subjects are covered in the past IFOAM Conferences, but the subject of Landscaping has never been covered before. In the fast developing urbanization, the ecological balance is disturbed by filling up of water bodies, removal of trees to make room for residential and office complexes, developing infrastructure and intensive use of chemicals in the landscaped gardens, leading to global warming, carbon imprint, environmental pollution and climate change, etc. Greenery is being replaced by jungle of concrete. Horizontal landmass is reducing in fast developing towns and cities. Recent trend to design Green Buildings is an initiative to reverse the deteriorating condition and conserve Nature. Consciously planned city Landscape gardens, both on the ground and over the Roof Tops, clubbing the techniques of '**Biodynamic**', '**Bioponic**' (Singhanian and Singhanian 2011), and '**Bioenergetics**' (which involves measuring the energies emitted by Plants, trees, etc. and carefully placed on detected Energy Grids on earth to transmit the electro-magnetic waves known to influence health of specific organs of human body), that could contribute to improving the environment and restoring ecological balance of the city.

The conventional approach is to take '**soil**' on the roof top and follow the conventional cultivation techniques using chemicals. This presentation introduces the innovative technology of '**BIOPONICS**' (innovated by the author, combining of the science of Biodynamic agriculture and Hydroponics).

### Main Chapter

#### Materials and Methods

Soil is replaced by BIOPONIC\* medium on Roof Top or Terrace Gardens. Now, even the top soil (of gardens on the ground) is replaced with BIOPONIC medium to a depth of preferably by 1 ft.

#### Composition of Bioponic medium:

Coarse Cinder (sieved through 200 mesh)	80% by volume
Coarse river bed sand	10% by volume
Biodynamic compost (fortified with BD preparations)	10% by volume

(\*Where cinder is not available, any inert coarse material with porosity could be used. Fly Ash is not recommended).

The medium is further enriched with VITALIZER formulations, an All-in-One Bio Feed and Soil Conditioner – a biologically rich biological food treated with Lady Maye E. Bruce's Quick Return Herbal Activator, BD-500 (one Portion) and CPP (one Portion).

#### On Roof Top Gardens:

The under bedding is filled up to 3" depth with full coarse raw (untreated) cinder.

The medium layer 8" depth is filled with the Bioponic medium, as above.

The top 1" to 2" top layer is spread with sieved Bioponic medium.

The top surface is covered with silver sand.

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In case of lawn, the grass is laid on the Bioponic medium, either by turf laying or by dibbling.

**On Ground Cultivation:**

The top soil (at least 8" to 10") is removed.

For efficient drainage, a trench grid is made, with 18" wide and at least 12" deep, removing the soil. The trench is filled with full coarse raw cinder, up to the soil level.

The top layer is refilled with Bioponic medium up to the depth of the soil removed, following the same layer as for the Roof Top Gardens.

Further experience of research and observation over 15 years has revealed:

- i. faster growth,
- ii. increased surface area of leaves
- iii. zero PPC use
- iv. low carbon imprint
- v. Reduction in ambient temperature, at least by 2 deg. Celsius.
- vi. reduction of electrical energy use within the buildings
- vii. reduction in the wet weight load factor (by more than 50%) of the roof top gardens when BIOPONIC medium is used.

**COMPARISION BETWEEN SOIL AND BIO-LAWNS**



**Bioponic medium being spread on ground**



**Lawn being laid on Bioponic medium**



**Grass Root growth within 24 hours on Bioponic medium**

	<b>SOIL- LAWN</b>	<b>BIO- LAWN</b>
1.	GROWN IN THE SOIL	GROWN IN SPECIALLY PREPARED <b>BIOPONIC MEDIUM</b>
2.	LAWN TAKES 3-6 MONTHS TO FORM CARPET, DEPENDING UPON THE VARIETY	LAWN TAKES <b>HALF THE TIME</b>
3.	CANNOT WORK WITH SOIL DURING RAINS, (SOIL BEING WET)	WORK CAN BE DONE, EVEN DURING RAINS
4.	REQUIRES SUB-SURFACE <b>INEFFICIENT</b> DRAINAGE MATERIALS LIKE BRICK BATS, GRAVELS, ETC. (THUS, <b>INCREASING THE COST</b> )	DOES NOT REQUIRE ANY SUB-SURFACE DRAINAGE MATERIAL (THUS <b>SAVING THE COST</b> )
5.	THE SOIL WEIGHT LIMITS INCREASING THE DEPTH ON THE ROOF TOP	<b>THE BIOPONIC MEDIUM REDUCES THE LOAD FACTOR BY 55% IN COMPARISON TO SOIL.</b> IT THEREFORE, FACILITATES INCREASING THE DEPTH (SO ESSENTIAL IN OUR HOT SUMMER, ESPECIALLY IF THE LAWN IS GROWN ON <b>THE ROOF TOP</b> ). THIS ALSO HELPS CREATE CONTOURS MORE CONVENIENTLY, WHICH IS NOT POSSIBLE WITH THE SOIL
6.	TREMENDOUS WEED PROBLEM	VIRTUALLY NO WEED PROBLEM
7.	IMPEDES (CHOKES) DRAINAGE	DOES NOT CHOKES DRAINAGE
8.	IMPROPER SOIL AERATION IMPEDES DEEPER PENETRATION OF ROOTS	EFFICIENT AERATION DEVELOPS DEEP PENETRATING ROOT SYSTEM
9.	<b>LEAVES GROW NARROW</b> HENCE <b>LESS ABRASIVE RESISTANT. CANNOT TAKE HEAVY TRAFFIC</b>	<b>LEAVES GROW MUCH BROADER</b> <b>TREMENDOUS ABRASIVE RESISTANCE. CAN TAKE HEAVY TRAFFIC</b>
10.	RECOVERS SLOW	<b>RECOVERS FASTER</b>
11.	MUDDY AND MESSY	NOT MUDDY AND MESSY
12.	SLIPPERY WHEN WET	NOT SLIPPERY WHEN WET
13.	WATER ACCUMULATION ON THE SURFACE DURING HEAVY RAIN	WATER PENETRATES INSTANTLY. NO WATER ACCUMULATION
14.	SUSCEPTIBLE TO VARIOUS DISEASES	<b>VIRTUALLY FREE OF DISEASES</b>
15.	INITIAL COST LOW	<b>INITIAL COST HIGH</b>
16.	<b>MAINTENANCE COST HIGH</b>	MAINTENANCE COST LOW
17.	TREATED WITH SYNTHETIC FERTILIZERS	TREATED WITH SPECIAL BIO INPUTS, <b>BIO DYNAMIC PREPARATIONS, ETC.</b>
18.	POLLUTES SOIL AND AIR	DOES NOT POLLUTE SOIL AND AIR
19.	CHANCES OF EXPOSING HANDS AND FEET WITH POISONOUS SUBSTANCE	NO CHANCE OF EXPOSING TO POISONOUS SUBSTANCES
20.	QUALITY POOR TO MODERATE WITH DULL GREEN COLOR	QUALITY EXCELLENT LUSH GROWTH WITH VIBRANT UNIFORM GREEN COLOR
21.	NOT SUITABLE FOR GOLF COURSE PUTTING LAWN	HIGHLY SUITABLE FOR <b>GOLF COURSE PUTTING LAWN</b>



**Zen Garden on Bioponic medium**



**Roof Garden on Bioponic Medium**



**Designer's Hedge on roof using BP medium**



**Roof Top Lawn on Bioponic Medium**

*The soil should never be mixed with the cinder, as it makes the colloid formation sticky.*

### **Core Messages and Conclusions**

It could be concluded that BIOPONIC method can be an alternative to Hydroponic technique, where careful monitoring of chemical feeding is required and could be practiced only by experienced growers. But Bioponic method has the advantage that it could be practiced by any inexperienced or even illiterate farmers or gardeners, because it is absolutely safe and is nature friendly. One can grow most of the shrubs, hedges, plants, annuals, climbers, vegetables, etc. But, however, the medium is yet to prove a better medium for growing some plants or trees, which requires clay soil.

Bioponic Gardens, enriched with Biodynamics could serve as an aesthetically beautiful creation within a cleaner and safer environment making use of harmonious cosmic energies.

The intervention of Bioenergetics in addition, will not only help the healing process of the human organs of the recovering patients in the hospitals, Health care units, etc. but would also help the inhabitants of residential complexes, public gardens, clubs, Green Buildings, Children gardens, Private gardens, etc. to keep their organs healthy and rejuvenated.

*\*BIOPONIC medium is a soilless medium prepared mixing coarse sand with Cinder (burnt coal ash derived from old furnace from boilers at Electricity generating units). The mix is enlivened by tailor made Biological Inputs and Biodynamic preparations.*

### **References**

Singhania P & Singhania A (2011): Bioponic Cultivation (a New Technology) VS Hydroponics, Proceedings of The 17<sup>th</sup> IFOAM OWC (Eprint ID 1359), Korea