Aquaponics: Paradigm Shift with Airlift part 2

Dr. Tetsuzan Benny Ron and Glenn Martinez

Olomana Gardens
Aquaponics: Paradigm Shift with Airlift Webinar Series

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Freshwater Aquaculture eXtension Community
http://www.extension.org/freshwater_aquaculture
Introduction to
Glenn Martinez
Olomana Gardens
Oahu, Hawaii
http://www.olomanagardens.com
permaculture, inventing, designing,
sustainable food growing systems,
from backyard & schools to large scale farms
Necessity is the Mother of Invention

American Samoa October 2011
The Principle by which Airlift Pump is Operating:

• The only energy required is provided by compressed air
• This air is usually compressed by a compressor or a blower
• The air is injected in the lower part of a pipe that transports a liquid
• It usually bubbles into another larger diameter pipe
The Principle by which Airlift Pump is Operating:

- By buoyancy the air, which has a lower density than the liquid, rises quickly.
- By fluid pressure, the liquid is taken in the ascendant air flow and moves in the same direction as the air.
The Principle by which Airlift Pump is Operating:

- The calculation of the volume flow of the liquid is possible thanks to the physics of two-phase flow.
- Airlift pump technology is superb due to its simple structure.
A **geyser pump**, an improved airlift pump, powered by compressed air, raises fluid by forcing rising bubbles to displace fluid. 50. Air supply. 52. Air inlet port. 58. Liquid supply. 60,62. air supply lines. 64. upper end of air tank 86. 66,82. Air ports. 70. Upper air inlet of u-shaped elbow 74. 76 Air outlet. 84. Fluid intake. 65. Riser tube. 88. Displaced liquid. 90. Pump outlet. L:Liquid, usually wastewater. LL: Liquid level. VVV:Vessel G:Gravel or solids
Three (3) Types of Airlift Pumps
Different Types of Airlift Pumps
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AquaPort

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Department of Human Nutrition, Food and Animal Sciences
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Spring to Koi Pond
Spring to Koi Pond – “Butterfly”
Spring to Koi Pond
How To “Butterfly” Water
Spring to Koi Pond
Up Over the Roof
Advantages of the Burper Pump Over Existing Art:

- Security: Air compressor indoors
- Safety: NO electricity in the fish tank
- No Ground Fault Interrupter GFI required
- Reliability: Air pumps over submersible
- Filtering the air compressor
Advantages of the Burper Pump Over Existing Art:

- Aeration: Air compressor is capable of TWO and THREE functions:
  1) pumping the water
  2) acts as a water aerator
  3) mixing: in some configurations lift stagnant bottom water to the surface
Advantages of the Burper Pump Over Existing Art:

• Energy savings: moving the water at higher rate
• Long life (water is not in contact with any mechanical elements)
• Pass-Thru Pumping: “stair lift”
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http://www.aquaculturehub.org

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