

Dr Wilson Lennard:

Background, Skills and Experience

Wilson Lennard PhD

When I decided to begin to write some aquaponic fact sheets for the wider aquaponic community, a friend advised me that a good place to begin would be to outline my background in terms of the skills, education and experience I possess. “This would assist people to understand that you have a history in the industry that is supported by your professional experience and credentials, along with a lot of practical and hands on experience”, he mused. Not a bad idea I guess, so here is that background.

Education

My education began at High School; well, not High School in fact, but Technical School. In Victoria, Australia at that time (1980’s) you had the choice to attend a High School or a Technical School. My parents decided that I was good with my hands and so schooling in the Technical, or Trade, skills would be appropriate for me. I studied many practical subjects in my first four years; wood work, sheet materials (metals, plastics etc...), electrical, car mechanics, engineering (fitting and turning, tool making), drafting and plumbing. My dad was also a qualified trades person (fitting and turning, tool making) and so I spent much time with him learning many practical skills.

In my final two years at “Tech” I moved into the Science stream and studied Biology, Chemistry, Physics and Mathematics.

After my final year at Tech I decided to work for a year to gain an understanding of what full time work was (I worked for the last three years of Tech at a local Bike Store – repairing and building bikes) and ended up as a Printers Assistant at the Victorian Government Printing Offices in Melbourne.

Factory work was enough to convince me that further education may be worth the effort! So, I enrolled in an Applied Biology Degree at Royal Melbourne Institute of Technology (RMIT), with a major in Ecology and Biochemistry. I completed this Degree in 1990.

The following year I returned to the work force and began working at an Aquarium store where I worked for a year selling fish and aquarium equipment to the public, along with learning to operate and manage an aquarium fish Quarantine facility. It was a shock to me to understand that I learned more in one year at the aquarium store than I did in the three years I attended University!

I returned to University again and completed an Honours Degree in Applied Biology majoring in Freshwater Crayfish (Yabby) reproductive biology where I developed an approach to gauge the reproductive potential of female yabbies, an approach to electro-stimulate and release sperm packets from male yabbies and an approach to remove the embryo’s from females 12 hours post egg laying and fertilisation for artificial incubation (another method I developed).

I then gained employment at Monash IVF; an assisted human reproduction clinic located in Melbourne. I learned much about the science of assisted human reproduction, including standard IVF, GIFT and Direct Egg Injection techniques and performed all the above methods and gained a very good success rate. I estimate I helped over 100 women have healthy babies in the 12 months I was there.

I spent the next six years evolving a career as a Freshwater Biologist, working for many and varied Universities and Government organisations (Lab Manager, Research

Technician, and Education Officer). It was toward the end of this period (around the year 2000) that I decided I wasn't going very far in science and that to go any further I would require further qualifications or experience.

I spoke to my old Honours supervisor and we put a plan together to apply for some research funds. The area of aquaculture that was of most interest was Aquaponics!

PhD

I had seen aquaponics in the 1980's and thought it was a great idea, but had really never taken the next step to take a good look at it. In mid 2000 I started to read and literature search aquaponics and found very little information. I put together a 100 page research proposal to the Australian Federal Governments agricultural research organisation, The Rural Industries Research and Development Corporation (RIRDC). The proposal was not successful, but RIRDC was interested enough to offer me a PhD scholarship, so I accepted. I must admit, I took my liberties and literature researched aquaponics and designed my experimental set up before I even got to University to start in 2002.

From February 2002 until February 2005 I spent 3 solid years in the RMIT Aquaculture laboratory performing a number of replicated experiments to optimise aquaponics for Australian fish species (Murray Cod). I tested many different aquaponic parameters in my replicated media bed set up, including constant flow vs reciprocal flow, pH requirement, buffer species, media bed vs deep flow vs NFT and starting nutrient levels. I also produced a mathematical model for nutrient balancing in the system and ran a 16 week lettuce production trial to test my results.

Interestingly, during this period I was contacted by a number of people who have become major players around the world in aquaponics, all of whom obtained much information on aquaponics from me and rarely, if ever, make that association!

The outcome of the 4 years of study was a 400 page PhD Thesis which was accepted in early 2006, and I was conferred to the degree of Doctorate in Applied Biology in August 2006.

Business

Towards the end of 2005 I was approached by someone to build a commercial scale system. Over the next 12 months I designed and we built the system in Kinglake, Victoria. This became the Minnamurra Aquaponics business which lasted until mid 2008. We had success growing and selling Murray Cod to local restaurants and herbs to a local Pesto and dips manufacturer. In the last 6 months of the business I developed a "direct sales to the restaurant door" approach and serviced many restaurants in the Yarra Valley region, just outside of Melbourne.

The business was eventually closed due to health issues within my business partner's family. We had economic success, but spent almost half the time we had building infrastructure (I did my fair share of the building) and so didn't have long enough to prove financial viability over an acceptable time period.

The entire time I ran this business I also worked part time in a wetland plant nursery, producing millions of wetland plants for the constructed wetland industry.

A Return to Paid Work

After Minnamurra was closed I returned to initially work for 6 months for a company in Melbourne who were developing a recirculation aquaculture business growing Murray Cod. I then moved to, and worked in, a sustainable water company for 12 months. This was great experience and it is where I learned about constructed wetland design and developed my own sizing models based on the available science. It was also where I learned how to use AutoCAD so I could do technical and blueprint drawings.

The New Zealand Project

In 2009, Ashley Berrysmith, of Snap Fresh Foods NZ, approached me to do a 12 month project to compare plant production in aquaponics with standard hydroponics. I spent the 10 months from May 2009 to March 2010 in NZ designing, constructing (all with my own hands!), commissioning and testing the system. After I left we employed a technician to do a further 18 months of trials. These included herb comparison trials, lettuce comparison trials and a 5 month commercial lettuce run.

This was a very successful project which proved that aquaponics could stand side by side with standard hydroponics in terms of plant production and plant quality. It was also a 100% NFT aquaponic system.

Since I returned from NZ I have developed my own business in Melbourne. I have consulted on several aquaponic projects and have done work in other fields (wetland design and management, horticulture and standard recirculating aquaculture). I have taught a number of aquaponic workshops and consulted to foreign and Australian governments on aquaponic projects.

I am currently working to continue the development of my own business which has become an international consulting firm, specialising in aquaponics. I have developed and released a hobby aquaponic system design tool and recently updated that to version 2.0.

The latest project I am working on is an aid program to introduce aquaponics into the Pacific Islands for food security and business development, which I do in partnership with Pacific Islands Trade and Invest and NZ Aid in NZ.

I have an ongoing project in Singapore for large scale commercial aquaponics and I have developed a teaching association with Dr James Rakocy and Aquatic Ecosystems (America's largest aquaculture equipment supplier) where we teach commercial aquaponics in the USA about 3 times a year. I also do commercial

aquaponics workshops in Australia with Murray Hallam of Practical Aquaponics.

I have recently leased a piece of land in suburban Melbourne where I will develop and construct a small, replicated aquaponic research set up so I can continue my own, self-funded research. I will also design and construct a small commercial aquaponics system on this site to prove financial viability of the technology using a small, local, urban approach.

I also have plans to build another urban commercial aquaponics set up in Melbourne in early 2013; as long as other work doesn't distract me!

I now have an association with Aquatic EcoSystems in the USA; America's largest supplier of equipment to the aquaculture and aquarium industries. This will realise a long term goal of mine of the release of a number of products (buffers, biofilter organisms, micro-element supplement etc...) for the hobby scale industry. I also plan to release a number of sets of plans for small commercial aquaponic systems and the associated management manuals; another long term goal of mine.

I am also currently a board member of the Aquaponics Association; a USA based aquaponics association. This is one of the best things I have been involved in as I believe there cannot be any real aquaponics industry without industry representation. It is currently a great shame I believe that Australian aquaponics devotee's cannot get beyond their petty infighting and cynicism and form an association in Australia; hopefully this may soon happen!

Conclusion

I hope this document helps people to understand my overall science background and my now almost 12 year association with aquaponics. Yes, I am academically educated. No, I don't have a PhD in aquaponics; it is in Applied Biology. But, the entire research was done on aquaponics and optimising it for Australian conditions.

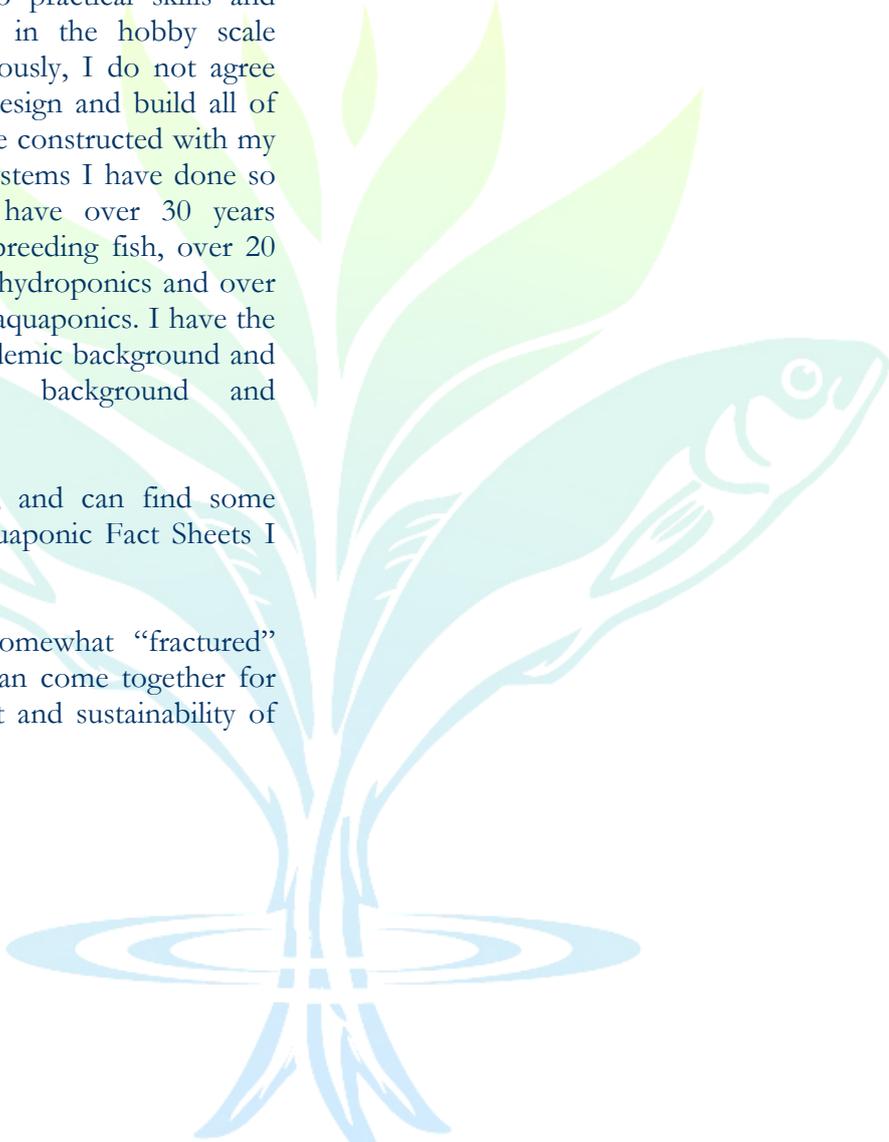
I have noticed over the years that a few people in hobby aquaponics (usually expressed facelessly via an aquaponics forum) have had some fairly critical things to say about me and my work. The most often heard thing is that “...academics with PhD’s aren’t experts, a PhD qualification doesn’t mean that much, PhD qualified people have no practical skills and there is more expertise in the hobby scale aquaponics ranks”. Obviously, I do not agree with this in my case. I design and build all of my own systems and have constructed with my own two hands all the systems I have done so far as a consultant. I have over 30 years experience keeping and breeding fish, over 20 years of experience with hydroponics and over 12 years experience with aquaponics. I have the luck to have both an academic background and a practical, hands-on background and experience.

I hope everyone enjoys, and can find some value in, the coming Aquaponic Fact Sheets I wish to release.

I also hope that the somewhat “fractured” aquaponics community can come together for the long term betterment and sustainability of an aquaponics industry.

Happy Aquaponicing!

Wilson Lennard
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aquaponic solutions