u-tube creation

We (MY COMPANY-NATURAL SYSTEMS) first got the idea from a paper written by a Mr. Dahmer a researcher in the oil recovery business who explained in a trade publication how they had devisd a u-tube to dissolve air (all the gases including nitrogen, oxygen and carbon dioxide) in water and then inject the super saturated water under oil rich shale. the dissolved air would fizz off as tiny bubbles that would bubble up under the shale pushing the oil ahead, thereby helping to recover more oil from areas that were previously pumped out.

Our first question to him was would a similar setup or process allow us to dissolve pure oxygen (without the nitrogen being dissolved) in the water, and if so just how much oxygen could be dissolved. Mr. Dahmer did not know because he had never tried it, but said that we wanted to, we should try it and see how it works.

We decided to move forward in this, and as I had sufficient money from our large Mexico contract and we drilled a hole 4 inches in diameter in the ground just out side of our greenhouse that was 35 feet deep. I had already arranged to have a large tank of liquid oxygen placed on our property and installed a number of other systems to find the best way to get the most oxygen to our tilapia.

We then took a 3 inch piece of PVC pipe, glued a cap on what was going to be the bottom and dropped the pipe to the bottom of the 35 foot hole. then dropped a second piece of 2 inch diameter pipe and dropped it in until it rested on the bottom of the 3 inch piece of pipe then glued a 3 inch T on the 3 inch pipe. We left a few inches of 2 inch pipe sticking out of the top of the 3 inch pipe. We then took a 2 inch by 3 inch reduction fitting and carved out the PVC retaining ring in the two inch part of the reduction fitting so the ring reduction fitting allowed the two inch pipe to be slid up enough to raise it 2 inches off the bottom and we then glued it so that it was held up off the bottom while it was working. We the hooked it up so that we were bringing tank water to be sent down the utube with a measured amount of oxygen so that we were able to get 35 to 40 ppm going into a tank.

I got a consultation to design an intensive tank in Guadeloupe
for a nursuryman who decided he wanted to get into the tilapia business so I designed a complete system using all of the automated oxygen systems which would monitor the oxygen in the growing raceway, going down the u-tube, an coming out of the utube. I had the gentleman dig the hole for a u-tube 300 feet deep and when we dropped the pvc pipes and hooked it up and tested it the water coming out of the u-tube was over 300 ppm and so delivered approximatly one pound of dissolved oxygen per minute and so had plenty of oxygen to match

the feeding rate of the tilapia, pound for pound..

From this success I have been able to calculate how much oxygen can be dissolved very cheaply to match the oxygen being demanded by the tilapia and other organisms.

This U-tube system can be designed to meet almost any oxygen demand needed to keep tilapia lively, and hungry and growing under almost any conditions.

Call Mike at 386 454 2016 for consultation on meeting dissolved oxygen needs inexpensivly.

USA - Mike Sipe's simple intensive Pond for Tilapia farms

29 Nov 2009

Sipe's Simple System *Tilapia* Pond
High O2'S (12 TO 14 PPM'S)
=INTENSIVE SYSTEMS.
NORMAL O2' S (4 TO 6 PP"MS)
=**NORMAL SYSTEMS.**

Mr. Cherry: There are a lot of very **knowledgeable people who will scream that what I am suggesting is "unheard of" "impossible", and possibly "misleading", but they probably have not, been in Aquaculture for 36 years.**

They are probably younger than 70.

They probably have not Built and operated 5 individual pilot projects over the last 20 years, demonstrating the ability to grow tilapia in each system new system 20% cheaper than the previous one.

They probably did not spend over three million dollars simply to find out better ways to grow tilapia from improving the genetics, to improving the systems.

They probably did not develop tilapia brood stock (t. horonorum) generation by generation(over 100 generations) from brood stock received from Dr Hickling that produced hybrids that yielded 24% fillet as skinless boneless fillets in 1963 and now (2010) yield over 50% skinless boneless fillets

My hornorum males now produce hybrid pennyfish that grow from 10 grams each to an average of a kilogram in 34 weeks and now in (2010) yield over 50% fillet.

They probably did not figure out how to raise over three million pounds per acre of water five feet deep, and spend less than$300,000 per acre to do it.

That is $300,000 for one acre and the equipment needed to run my system, that will allow the production of over 3,000,000 pounds of tilapia

per year.

I did figure out how to do this basing the system on the knowledge I gained over 35 years of really working on my four pilot projects.

I figure that if I worked from the time I was thirty five until I am seventy on four **pilot projects** that now that I am seventy **it is time get the project off the ground and fly.**

The essence of this communication is to explain why dissolved oxygen delivered directly to aquatic organisms is the most important factor in all growth of each animal.

Oxygen levels of 12 to 14 ppm improves the growing of tilapia and all other aquatic and non aquatic animals by supplying oxygen needs on a 24/7 basis.

The oxygen supports the aerobic digestion of all foods whenever the tilapia needs or wants to eat.

The response of tilapia to high levels of dissolved oxygen in our tank system suggest that oxygen really does do the job.

In a "normal" enviourement aquatic organisms seldom experience good conditions for growth and therefore usually average of no more than 3 hours out of 24.

This is because oxygen levels fluctuate upwards from levels lower than those needed for growth as the day length lengthens or goes through the sunny portion(high light level) which triggers "hunger."

In the evening or low light level time when the built in controls in each organism purposely slows down growth to a not hungry state until the next high light level time recurs (with higher oxygen levels in the 4 to 6ppm levels) and the fish is once again "**hungry**"

This cycle is more easily noted in warm (65 and up to 90 degrees farenheight) water with a high algae content that increases the oxygen level in the water during the algae's growth period because the rapid growth of algae during bright times.

This rapid growth of algae adds oxygen rapidly to the water as dissolved oxygen until the oxygen levels reach the "hungry " level (above 6ppm) then when lower light (like during periods of time of dimmer light levels like on cloudy days and in the late afternoons during the spring, summer and fall) periods) growth slows because of the lower quantity of dissolved oxygen available.

Because of the quantity of oxygen dissolved during the bright stimulation of photosynthesis in the water due to the faster algae growth

Oxygen generally becomes more abundant and available because of the higher levels of oxygen that occur in cooler water .

When dissolved oxygen is supplied directly we extend the good conditions for growth from an average of 3 hours a day to 14 or more hours each day.

This enabling alone can allow up to four times the growth in any aquatic animal.

With the system of u-tube injection of oxygen that I pioneered more than 30 years ago, I have perfected as I built different styles and improved on the efficiency (which now has 99% of the oxygen delivered As dissolved oxygen to the tanks where the fish are grown.)

The total square feet in one acre is 43,560 square feet. If we place enough pounds of pennyfish in cages in the lake to equal an average of one pound per cubic foot we will be using the biomass of these 43,560 pounds of tilapia to produce a daily production of 1.765% times the total stocking density which when we grow the fish in correct growing systems we will grow 766 pounds of weight that will be distributed proportionally to each tilapia in the system.

The fact is that the total weight of biomass of grow able tilapia in the system means that the poundage is much higher and more controllable in this system because the increased oxygen system is needed care for this increased load.

The total pounds grown can be extended to much higher numbers because of the constant steady supply of oxygen from the u-tube.

In fact we have maintained without difficulty stocking densities between 6-7 pounds per cubic foot in our system.

At these densities we have been able to stop almost every difficulty that we got into to because we had a dependable highly efficient
u-tube that delivered over 100 parts per million of dissolved oxygen when it was needed and distributed it almost instantly throughout the fish tanks.

This meant that in any situation where there was any oxygen stress we quickly eliminated the problem and were able to grow our tilapia with much more confidence, because the crop was always safe.

The ease if distributing oxygen evenly throughout each tank has proven to be very reliable. The stoking density calculated for each cubic foot can safely be 1, to 7 pounds of pennyfish per cubic foot.

Each pound of all sizes can add new

weight at just under 2 % per day of the weight on the previous day or 1.76% of growth per day of the total previous days previous days weight.

I have a sort of algorithm that helped me come up with this growth perception. So using these numbers and figuring the total biomass of the pond we can get a good idea of how many pounds of each size need to be included in the biomass to get the best return from each new project.

At a weight of one pound of pennyfish per cubic foot , we will have a total weight of 43,560 pounds of pennyfish per cubic foot of pond.

The size of each pennyfish in the lake can be from one ounce up to two pounds per pennyfish, to make up the total weight stocked to reach a total of one pound per cubic foot.

If we have clean water and the appropriate pounds of quality feed we will see a growth of 1.76% of that total biomass each day. ()
The total pounds of pennyfish that are in the lake will grow on each day of growth at the rate of just under 2% or 1.76% per day of the previous days total weight.

the total number of pounds stocked in the whole lake to achieve a stocking density of one pond per cubic foot is then 43,000 pounds per pound per square foot of the lake

So, if we stock one pound of pennyfish per cubic food the will have a total of 43,560 pounds times 1.76 % per pound which will be 767 pounds per day for the first day and approximately seven times 767 pounds for each consecutive day. in a week (once we pass the magic day) we should be able to harvest 5,369 pounds of pennyfish each week

I have grown enough pounds of fish in systems for over 10 years to understand and utilise these numbers, but it has taken me most of that time to take a look at the relevant numbers, understand them and draw some some appropriate and very interesting conclusions.

An intensified one acre pond set up with my system kept at 85 degrees F. where you can feed and oxygenate 50,000 pounds of pennyfish will produce 5,369 pounds a day provided the temperature is right (85-88 degrees farenheight,) the water quality is good and the feed is at least 32% protein with no animal fat.

At least 9,000 pounds of this feed are fed to the pennyfish the previous week. Nine thousand pounds of dissolved oxygen must also be produced, dissolved and delivered and utilised by the fish to grow.

I have put as many as 7 pounds of

pennyfish per cubic foot in intensive tanks and have seen the fish really grow out that speed, so stocking one pound of pennyfish per cubic foot should be easy in comparison. ("A walk in the park") so to speak.

I have posted an excellent video which shows how happy and comfortable our hybrids were in the water in our intensive system which was being recirculated after it was run through our biofilter and through our u-tube where the oxygen was dissolved up to over 100 parts per million before being delivered into each of the two tanks from a single entry point in each tank.
I personally measured the ppm of each tank by getting into the tanks at the distal point from the injection point. I found that the oxygen level at the starting point was fluctuating between 12 and 14 ppm's at the entry point and I then walked through the tanks to where

the delivery nozzle was and the oxygen fluctuated between 12 ad 24 ppm's until I got within 3 feet of the nozzel and then if i found a stream on the bottom it fluctuated briefly up to around 18 ppm's. When I got within reach of the nozzle the reading began to climb until it was FIUCTUATING BETWEEN 95 AND 105 WHAT THIS MEAT WAS THAT THE DISSOLVED OXYGEN WAS MOVING BETWEEN THE WATER MOLECULES ALMOST LIKE STATIC ELECTRICITY.

IT ALSO MEANT THAT I COULD QUICKLY DISTRIBUTE OXYGEN THROUGHOUT A TANK OR POND EVEN WITH A SIngle entry POINT MEANING I COULD EFFECTIVELY OXYGENATE AN ENTIRE AREA(maybe PROBABLY an acre) FROM A SINGLE ENTRY POINT. PPM'S.

if you really want to understand why oxygen is so important just watch the video over and over for a couple of hours until you understand what is happening.

go to "you tube" on the internet and type in the words "cherry" and "snapper" in the search area. Like this "cherry snapper" then just keep repeating the video until you begin to understand the role of increased oxygen in maintaining quality conditions where all of the tilapia in the tank can eat, eat, and eat for a full half a day instead of the limited time period of 3 to four hours in a natural pond. Note too that the immense number of tilapia present in the tank (six to seven pounds of tilapia per cubic foot of water.) where as in a natural pond or lake we could not safely exceed a half pound of tilapia per cubic foot of water.

Even if the tilapia were stocked at an ounce per cubic foot, which is the safe upper limit, the total number of pounds of live tilapia
in an acre would only be 2,812 pounds per acre the most weight gain that would be possible would only be .0176% of that

total biomass of tilapia would only be 56 pounds per day wit a full day of growth and with only a fourth of the time would be useable as growth time that means that the total growth in pounds per acre per day could only reach an average of around 18 pounds per day per acre. In 365 days that would come to a total production of almost 7,000 pounds per acre per year. The published harvest in several ideal areas in the sea- level tropics was only 10,000 pounds er acre with a large growth of algae which supped very good oxygen levels for a good part of the usable day This 10,000 pounds per year in highly fertilised acres makes since be cause of the extended eating period for sucking algae (eating).

View my intensive farm, built and run 10 years ago, this was an intensive tank where the O2 level was maintained by a u-tube designed by us and supplied with sufficient oxygen to dissolve AND

MAINTAIN an O2 level of 12 to 14 parts per million in order to maintain this stocking density and do so safely..

This high level of oxygen (12 ppm to 14ppm) maintained throughout the entire system is the only thing that makes this intensive tilapia growing tank capable of growing so many, many pounds of production so quickly.

A system of of one acre in size size should be able to produce over 475,000 pounds per year which will bring in at $3.00 per pound $1,423,858 each year.

I have run many spread sheets that included estimates of the cost of construction, management, feed, power, processing, labour and oxygen that show an overall cost per pound for raising these tilapia at cost well under 50 cents per pound.

At 50 cents cost per pound and an income of $3.00 PER POUND LIVE OF

$1,423,858 AND A "PROFIT" OF OVER $1,000,000 PER YEAR AND IF THE POND IS BUILT USING MY COST ESTIMATE OF $259,000 FOR CONSTRUCTION .

my projected revenue from a one acre pond with a stocking density of **5 pounds** of pennyfish per cubic foot.

My estimate is that with 1 pound per cubic foot as a stocking density OF 45,000 POUNDS ONE POUND PER CUBIC FOOT OF WATER) one acre the total revenue will be $1,423,858

My estimate is that with 2 pounds per cubic foot as a stocking density the total revenue will be $2, 847,716

My estimate is that with 3 pounds per cubic foot as a stocking density the total revenue will be $4,271,574

My estimate is that with 4 pounds per cubic foot as a stocking density the total revenue will be $6

My estimate is that with 5 pounds per cubic foot as a stocking density the total revenue will be $7,119,294

sincerely,

MIKE SIPE