



Hoosier Fish Tales

Mission Statement: The IAAI (Indiana Aquaculture Association, Incorporated) enables aquaculture producers by promoting, marketing, educating, and nurturing aquaculture and aquaculture research in Indiana.



Photo by Cecil Baird

Male bluegills typically grow larger and faster than females. This particular bluegill was grown out in a pond with an all male bluegill population and fed an artificial diet. This fish is well over a pound but only 3 years of age.

The latest research actually shows bluegills outperform hybrid bluegills after an initial growth spurt by hybrids in an all male population of male bluegills.

Quick Quiz

What common aquatic plant appears to be a macrophyte (rooted plant) but is actually an algae?

- A) Chara
- B) Sago Pond Weed
- C) Duck Weed

The answer is on page 8.

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The IAAI Newsletter is produced quarterly and available at <http://www.indianaaquaculture.org/>



President's Letter

Ladies and Gentlemen,

Spring is here and we will be going into Summer in a few short weeks. 95 was the high here a couple of days in a row recently and tomorrow on the first day of June the high will be 50. Last fall was very wet and this spring has been abnormally dry until today when it's raining nonstop. Like Mark Twain said, "Everybody talks about the weather but nobody does anything about it."

The unpredictability of the weather is one of the reasons I believe recirculating aquaculture systems are the wave of the future along with their conservative water use vs. pond culture and flow through. There's also the control one gets and harvesting fish out of a tank is vastly easier than running a seine through a pond! I can attest to that!

I believe fish will also have to be reared from the egg in enclosed indoor systems to make the systems independent of any outside weather fluctuations. Unfortunately some species don't take to prepared artificial feeds from swim up and this is a challenge that

is being worked on at the research and trial and area arena.

This brings up the point of my letter: we need to be flexible and try something new from time to time. It tough to change our methods especially if we've been doing something that works. I don't believe outside pond culture is over by any means, but even for those that practice it exclusively, I see more and more going to recirculating systems at least partially. I'm personally tickled I produced my first smallmouth bass hatch in one of my rearing ponds. Hopefully I'll be able to do so entirely indoors at some point to increase efficiency and profitability. I'm always trying something new although I am not always successful. However, I always come away learning something. I hope you are all trying something new too.

May this be a prosperous if not educational year for you.

Cecil D. Baird

IAAI President

Like Mark Twain said, "Everybody talks about the weather but nobody does anything about it."

Call for Candidates

by Rob Wibbeler

To govern the affairs of the new 501c3, the following boards are in the process of being established.

Board of Directors (BOD) The policy making and governing body of the organization.

Board of Trustees (advisory group to BOD) Solicits, evaluates, prioritizes and recommends major initiatives, uses of funding and excess revenues to the BOD.

Board of Representatives (advisory group to BOD/BOT) Purpose is to develop, organize, prioritize and promote the work projects of the 501c3. Made up of members of various stakeholder groups such as grade schools, high schools, community colleges, adult learners, universities, industry, farm operators, consumer groups.

If you, or anyone you know with an interest in this program or might like to serve on one of these boards, let me or any IAAI board member know.

Naming choices for the new 501c3. Let us know your favorite.

- Aquaculture Education Council of Indiana
- Indiana Aquaculture Education Alliance
- Center for Indiana Aquaculture Education
- Indiana Focus for Aquaculture Education
- Indiana Aquaculture Education
- Institute

Contact Rob Wibbeler at rwibbeler@indianaaquaculture.org or at 317-417-0090



Southmont High School Visit

By Rob Wibbeler

Editors's Note: Rob visited the Southmont High School in Crawfordsville, Indiana and interviewed the teacher and students about their aquaculture setup.

Q: Why did the school decide to get into Aquaculture?

We have a strong horticulture program and see this as a way to get into aquaponics and offer additional experiences to students.

Q: Who was the individual or teacher that was instrumental in getting the ball rolling?

FFA Advisors have been involved from the beginning. Gary Mosbaugh started the program and Jeanna Eppley is leading the efforts today.

Q: Why did you decide on tilapia?

They are easy to grow. Tilapia can tolerate wider ranges of water parameters than most other species giving us the best chance to be successful early on. Plus they are easier to sell.

Q: Do you produce your own starter fish or do you purchase them?

We purchase from local growers. South Putnam High School helped get us started with our first crop.



Photo by Rob Wibbeler

Q: Where do you get them?

We are looking to growers such as Dan Cassidy (IAAI member) from Spencer County to provide an annual supply of fingerlings.

Q: What species of tilapia are you using?

Ours are mostly blue tilapia (*Oreochromis niloticus*). We do have some pearl and red tilapia.

Q: How long have you been raising fish?

We began in 2011 and our first harvest is occurring now.

Q: How many students are involved in the program?

We have ten that are actively involved.

Q: What kind of bio and mechanical filter are you using?

I guess you could truly call it home-made. We took recycled plastic barrels from a local car wash and filled them with media donated by Jim Bradley (IAAI member), then attached tubing and float valves and these systems produced our first crop.

Q: How many tanks do you have and what size?

2 tanks total, one 500 gallon and one 300 gallon.

Q: Have you had any problems or crises?

There has been some spiking of ammonia, but we lost no fish from this. The major problem we have is from fish jumping out of the tanks even though we have nets.

Q: What brand of feed do you use?

Aquamax 400.

Continued on next page



Southmont Interview (con't)

Q: How much do you feed and how often?

We followed the directions on the bag adjusting for the size of the fish.

Q: Do you think the program may result in fish farmers?

As it exists right now, that could be difficult. We have one student very interested but the others have not expressed a desire. Our kids are not afraid of hard work but the amount of effort required to grow fish with the systems in place does not accurately represent the aquaculture industry and is frankly a turn off for many of today's youth. On the flip side, the students understand that fish farming is hard work, but when imagination, drive and hard work come together success is often achieved.

For aquaculture to succeed at the high school level we must show our administration the value of the program.

Aquaculture is a great way to build across various curriculums. Students become engaged in biology, chemistry and mathematics as they culture fish. Reading and writing skills are tested as they analyze industry data and prepare reports. Business acumen is developed when students learn to develop a business model and prepare marketing plans to sell the fish at the end of the school year. Aquaculture is a great way to teach students and build upon the core curriculum standards Indiana schools are challenged to achieve.

Q: Have you considered aquaponics?

Absolutely! This is the direction we are going.



Photo by Rob Wibbeler

Indiana Department of Agriculture Awards IAAI Two Grants

by Rob Wibbeler

The ISDA Livestock Promotion Grant Program is helping to fund the Elkhart County Local Business Summer Gala which is a culinary experience bringing agricultural producers and restaurants together to promote locally raised livestock to area businesses.

Local producers are providing in-kind matching funds. From this event we plan to identify benefits of conducting similar events throughout Indiana.

The ISDA Livestock Market development Grant is helping to develop a marketing plan to advertise the availability of the Fair Oaks Aquaculture Adventure to the academic community, aquaculture industry and to the public in general via use of facilities and distance technology. The Indiana Soybean Alliance provided matching funds to help design the interactive, immersive and educational experiences.

Looking to Grow Koi?

One of our members is looking for someone who might have extra space to raise koi. John Tinius has the capacity to produce koi, but needs more space for these to grow out (earthen ponds are especially good). He is willing to pay someone to grow-out a crop. Looks like potential for contract production. If you, or one of your neighbors is interested contact John Tinius by e-mail, mrkoiguy@aol.com or phone 812-945-0707.



Test your Aquaculture/Aquaponics Knowledge!

Answers and Scoring Guide on Page 7



1. What is the lowest safe level of oxygen for trout rearing?
 - A. 4 ppm
 - B. 5 ppm
 - C. 6 ppm
2. What are the three classifications of static pond rearing of fish that are dependent on density and the amount of artificial feed?
3. What compound is known as the “aspirin of aquaculture” in relation to freshwater species?
4. What species of bass in the centrarchidae family is noted by its distinct black color at swim up?
5. In the UVI raft system the ratio of plant growing area to fish surface area is
 - A. 2.8
 - B. 4.1
 - C. 7.3
6. Which is more lethal to fish -- Ionized $\text{NH}_4^{+--}\text{N}$ or unionized ammonia NH_3^{--}N ?
7. Which of the following two choices are NOT advantages of RAS’ (recirculating aquaculture systems).
 - A. Conservation of heat and water
 - B. Low Capital costs
 - C. Effective economies of scale
 - D. 1 percent of the area of conventional systems
 - E. Easy to operate and require little training.
8. True or False: Unionized ammonia (NH_3^{--}N) goes up with increased temperature and PH.
9. What gas produced by fish can be a limiting factor in a closed high density system and needs to be purged?
10. True or False: A hybrid striped bass is a cross between a female striped bass and a male white bass.
11. What is the optimum temperature range for Tilapia?
 - A. 12 to 14 C.
 - B. 28 to 32 C.
 - C. 25 to 28 C.
12. What is TAN?
13. True or False: Circular tanks are less than optimum for removing solids vs. other tank configurations.
14. The number one aquaculture species consumed in the U.S. as of 2010 was:
 - A. Catfish
 - B. Shrimp
 - C. Tilapia
 - D. Salmon
15. The number one aquaculture species produced in the U.S. as of 2010 was:
 - A. Catfish
 - B. Shrimp
 - C. Tilapia
 - D. Salmon
16. What does UVI stand for in aquaponics?
17. What are the two generally accepted methods for manually fertilizing eggs of fish?
18. What species of baitfish is not on the susceptible species list for VHS but still requires testing for VHS?

Continued on next page



Knowledge Test (con't)

19. What salmonid species is not on the susceptible species list for VHS and therefore does not require a pre-entry permit into Indiana by the Board of Animal Health (BOAH)?
20. What virus was found to test positive in live fish samples in all the major Great Lakes ports but showed no clinical signs in the fish sampled?
21. What aquaculture product makes up one quarter of world aquaculture production?
22. What do the terms sequential rearing, stock splitting, and multiple rearing refer to in aquaculture?

Answer and scoring guide on page 7

2012 Workshop for Veterinarians on Fish Regulatory Medicine Tuesday July 31, 2012.

Fish regulatory medicine is at a crossroads in the US - Plan to attend to share your experience and opinion on the direction of fish regulatory medicine.

There is no fee for this workshop and CE credits will be awarded to veterinarians who attend.

This year the workshop will be held in conjunction with:

- Great Lakes Fish Health Committee meeting July 30 and July 31
- USFWS Aquaculture Drug Approval Coordination Workshop July 31
- American Fisheries Society- Fish Health Section meeting Aug. 1-3

For more information go to: <http://datcp.wi.gov/uploads/Animals/pdf/FishRegulatoryMedicineWorkshopJuly2012.pdf>

Upcoming Dates and Events

Greetings all,

Save the date - mark your calendar now!

We are planning a fall meeting Saturday October 20. Details to follow. Planned events include trips to TIPPCO Fish, Romney IN; RDM Farms, Fowler, IN and the Purdue Aquaculture Lab.

Updates on Fair Oaks Project

The business model and a proposed layout of the Fair Oaks Aquaculture Adventure are complete. Many of the technical aspects are moving along. These include the operating agreements, messages, technologies and partnership arrangements.

We are at a point where the organization of the new 501c3 is a priority.

Feel free to contact me if you have questions.

Rob Wibbeler

Fair Oaks Project Manager

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Rooftop Aquaculture in Suburban Germany

Germany is working on aquaculture solution to the oceans' overfishing crisis: rooftop aquaculture systems. The project currently in place in Berlin and consists of perch in metal tanks. Owners only need to top off the water and feed the fish. The fish byproducts are pumped to a nearby greenhouse to fertilize tomatoes, herbs and lettuce.

The plan is simple but has many advantages. Fresh fish can be sold to local dwellers along with pesticide free vegetables and herbs. Once the idea takes off it will be a resource-efficient way to feed a growing urban population.

For more details and the complete article go to: <http://www.guardian.co.uk/environment/2012/jun/04/rooftop-fish-farms-german-population>

Answers to the Knowledge Quiz

Here are the answers to the test.

21-22 correct = You're an aquaculture/
aquaponics rockstar.

18 - 20 correct = You're an aqua-geek.

15-17 correct = You're an aqua-geek with a life.
12-14 correct = You're a wanna be geek. Keep
learning.

Less than 12 correct = Keep studying. You'll
get there.

1. B. 5 ppm

Piper, Robert G.; McElwain, Ivan B.; Orme, Leo E.;
McCraen, Joseph P.; Fowler, Laurie G.; Leonard,
John R. Fish Hatchery Management. Washington
D.C. Department of Interior U.S. Fish and Wildlife
Service 1992

2. Extensive – No supplemental artificial feed or fertilization, low density, no aeration

Semi-intensive – Some supplemental feed,
Possible fertilization, medium density, possible
aeration

Intensive – High level of supplemental feed, high
density, definite aeration

3. Answer: Sodium Chloride (NaCl) aka common salt. It's used to reduce stress by placing a fish back into an osmotic salt balance that stress can wreck havoc on. Some closed systems use salt perpetually, e.g. 0.2 percent, 2.0 ppt, 2000 ppm.

4. Smallmouth bass



Photo by Cecil Baird

5. C. 7-3

6. Unionized NH₃- --N.

7. Answers B. & E. Initial capital costs are
typically high with RAS'. Additionally RAS's are
not easy to operate and require serious training.
High density systems can experience rapid fish
mortality due to operator error or a lack of
understanding of water quality issues.

8. True.

9. Answer: Carbon Dioxide. (CO₂)

10. True, but the reciprocal cross using a female
white bass and a male striped bass is also true.
The former cross is referred to as a Palmetto
Bass. Using a female white bass X male striped
bass produces a variety know as the "Sunshine
Bass." Sunshine Bass are more commonly used in
aquaculture and fisheries programs.

<http://edis.ifas.ufl.edu/fa155>

11. C. 28 to 32 C.

Timmons M.B., Ebeling J.M, Recirculating
Aquaculture (2nd Ed. Ithaca, Cayuga Aqua Ventures,
2010

12. Answer: Total Ammonia Nitrogen (NH₄+N + NH₃- N)

13. False. Using centripetal flow and a center
drain, circular tanks are virtually self cleaning of
settleable solids. If a side drain is added
suspended solids can also be effectively removed.

14. B. Shrimp.

[http://www.aboutseafood.com/about/about-seafood/
top-10-consumed-seafoods](http://www.aboutseafood.com/about/about-seafood/top-10-consumed-seafoods)

(Statistics from the National Marine Fisheries Service)

15. A. Channel Catfish

<http://www.fao.org/fishery/topic/13531/en>

Continued on next page



Test Answers (con't)

16. UVI = University of Virgin Islands and refers to the UVI system designed by Dr. James E. Rakocy on raft culture of plants in conjunction with tilapia.

17. The Wet and Dry method.

Piper, Robert G.; McElwain, Ivan B.; Orme, Leo E.; McCraren, Joseph P.; Fowler, Laurie G.; Leonard, John R. Fish Hatchery Management. Washington D.C. Department of Interior U.S. Fish and Wildlife Service 1992

18. The Fathead Minnow. (*Pimephales promelas*).

<http://www.focusonfishhealth.org/species-affected.php>

19. Answer: Brook Trout (*Salvelinus fontinalis*)

Note: VHS is still required to be tested for in all salmonid species by the Indiana Department of Natural Resources. Brook trout also require an aquaculture permit in conjunction with a Fish Hauler's and Supplier's Permit.

<http://www.focusonfishhealth.org/species-affected.php>

<http://www.in.gov/boah/2388.htm>

20. VHS (Viral Hemorrhagic Septicemia)

Distribution of an Aquatic Pathogen (Viral Hemorrhagic Septicemia) in the Great Lakes and it's Relationship to Shipping by Mark B. Bain^{1*}, Emily R. Cornwell², Kristine M. Hope², Geoffrey E. Eckerlin¹, Rufina N. Casey², Geoffrey H. Grocock², Rodman G. Getchell², Paul R. Bowser², James R. Winton³, William N. Batts³, Allegra Cangelosi⁴, James W. Casey²

<http://www.plosone.org/article/info:doi/10.1371/journal.pone.0010156>

21. Aquatic plants.

<http://www.fao.org/fishery/topic/13531/en>

22. Sequential Rearing = Several age groups are reared in the same rearing tank.

Stock splitting = Stocking high densities of fingerlings and periodically splitting the population and moving fish to other tanks.

Multiple Rearing = The entire population is moved to larger rearing tanks or petitioned off in raceways to larger sections when carrying capacity is reached.

Timmons M.B., Ebeling J.M, Recirculating Aquaculture (2nd Ed. Ithaca, Cayuga Aqua Ventures, 2010

Answer to the Quick Quiz



The answer is A. Chara. Chara is a rootless algae that grows along the bottom and is very common in hard water. It is also known as skunk weed because of its distinctive odor. Often there is a calcium deposit on the plant.



Photos by Cecil Baird



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Tom will handle aquaculture extension matters south of I-70.

Upcoming Events**IAAI Meeting**

Save the date - mark your calendar now!

We are planning a fall meeting Saturday October 20. Details to follow. Planned events include trips to TIPPCO Fish, Romney IN; RDM Farms, Fowler, IN and the Purdue Aquaculture Lab.

Workshop for Veterinarians on Fish Regulatory Medicine

Will be held on July 31st in LaCrosse, WI. See page 6 for more details.

Deadline in Indiana to Apply for SBA Working Capital Loans Due to 2011 Drought and Excessive Heat is July 2

ATLANTA, June 6, 2012 -- /PRNewswire-USNewswire/ -- The [U.S. Small Business Administration](http://www.sacbee.com/2012/06/06/4543184/deadline-in-indiana-to-apply-for.html) is reminding small businesses, small agricultural cooperatives, small businesses engaged in aquaculture and most private non-profit organizations of all sizes that July 2 is the filing deadline for federal economic injury disaster loans available in Benton, Gibson, Knox, Newton, Posey, Sullivan, Vermillion, Vigo and Warren counties in Indiana as a result of drought and excessive heat that began on July 1, 2011. For more information go to: <http://www.sacbee.com/2012/06/06/4543184/deadline-in-indiana-to-apply-for.html>