

Fish Tales Newsletter

West Virginia's Aquaculture Newsletter is produced to help inform, educate, and update those interested in producing quality aquatic products, in a sustainable manner, for the recreational and food fish markets.

Aquaponic Research at WVU farm in Wardensville

By Karen Buzby

Aquaponics is the dual culture of fish and plants in which the plants use the waste nutrients generated through fish culture. Aquaponics provides farmers the opportunity to diversify their product line while helping to reduce the phosphorus and nitrogen concentrations in the effluent from the fish tanks.

Unlike most aquaponic systems, which use recirculating tanks and warm water fish such as tilapia, the system at WVU cultures trout in flow-through tanks generating high volumes of cold (55° F), relatively low nutrient concentration water. Plants are grown in Styrofoam trays filled with vermiculite. The trays are placed in channels constructed of plywood and lined with EPDM. The plant channels are located in an unheated greenhouse adjacent to the fish building where the trout are reared. Other than checking to ensure that the channels are receiving water, little labor other than sowing seeds and harvesting the crop is required.

Lettuce grows well in the system.



Early experiments, designed to investigate operating conditions that promoted plant growth and nutrient removal, determined that plant density (# plants/sq. ft.) had no effect on either growth or nutrient removal. However, the quantity of water (continued on page 3)

Aquaculture is Agriculture

By Rodney Kiser

Dr. Ken Semmens, aquaculture specialist, and Ms. Fonda Holehouse, attorney and visiting professor at the WVU Davis College, had the honor of addressing the West Virginia Farm Bureau Board of Directors on “The Status and Regulatory Structure of Aquaculture in W.Va.” The meeting was held Oct. 9 at Farm Bureau headquarters in Buckhannon. Ken began the presentation by offering a background into the current status of W.Va. aquaculture. Fonda presented a perspective on aquaculture law in W.Va., perceived problems with the statutory and regulatory structure, a background on policies of states with successful aquaculture industries, and suggestions on what should be done by government to encourage development of aquaculture in the state.

The presentation has been given at the Aquaculture Forum, to the W.Va. Department of Agriculture, at W.Va. University, and at NASAC in the continuing effort to expound the need for the Department of Agriculture to be the lead agency for aquaculture in the state. The presentation was well-received by those attending. Farm Bureau has pledged its support and agreement that “aquaculture is agriculture.” It was found through the course of the presentation that there are many challenges related to aquaculture that also directly affect other, more traditional forms of agriculture. The W.Va. Farm Bureau will be a strong ally in the effort to reform the aquaculture regulatory structure in West Virginia.

Heads-up on VHS

By Daniel Miller

The US Trout Farmers Association Midwest Aquaculture Conference was held in Milwaukee, Wis., this past September. The primary concern at this meeting was a governmental (USDA APHIS VHS interim) rule. This contentious issue was dealt with like a crisis in a loving family. As the VHS Summit was about to begin on the morning of the first day, moderator Bob Robinson, with a big smile, placed a paper bull's eye target on the chest of Gary Egrie, the APHIS representative.

It became clear that the **72-hour rule**, which requires an accredited veterinarian or a state-designated authority to physically inspect each shipment of fish destined to leave the state, is unworkable due to the limited number of these professionals and the large number of shipments needing this service.

Another problem is the **30-day rule**. Farms with open water sources have 30 days FROM THE DATE SAMPLED to ship their fish out of state once it is certified VHS free from an accredited lab. The problem with this rule is that the lab needs 28 days before it can determine the result with certainty. Not a single farmer in the room was able to get results within 30 days of sampling.

This is a cool-water virus that has mutated (type IVb) from the European variety, but it is worth noting that in nature aquatic viruses typically manifest themselves initially with relatively high mortality followed by a more latent infection that is tolerable to the species infected. In other words, nature moves on and the fittest survive. A useful fact sheet can be found on the Web (www.aphis.usda.gov/publications/animal_health/content/printable_version/faq_vhs_interim_rule.pdf).

Seven of the eight bordering states had representatives on the panel, and each one spoke about their efforts to monitor and control the spread of Viral Hemorrhagic Septicemia. When VHS arrives in W.Va., our farmers may face similar rules that are costly and unworkable for farms with open water sources.

For warm-water species, there is evidence that the virus may not be as problematic. An APHIS Web site had this to say about that.

Virus growth is generally inhibited when water temperatures are above 15°C; however, this VHS virus appears to have a much wider temperature range. According to research conducted at the U.S. Geological Survey, type IV(b), in vitro, grows best at 15°C and up to 20°C where growth begins to decline. Type IV(b) viral growth was inhibited at 25°C.

The W.Va. Dept. of Ag. is currently working to expand disease diagnosis at the Moorefield and Charleston labs. It is not too soon for WVDA to coordinate with WVDNR and the private fish farmers on how our state will deal with this outbreak in nature. *Fish Tales Newsletter* addressed the biosecurity issue in a lead article in the Fall 2007 issue. Biosecurity will continue to be an important aspect of fish farming, and W.Va. still has many biosecure water sources.

Did YOU KNOW?

By Daniel Miller

Dr. Gregory Wiens, who wrote an article on fish health in the Fall 2005 edition of *Fish Tales Newsletter*, has made great progress with his colleagues **Yniv Palti** and **Caird Rexroad** at the **National Center for Cool and Cold Water Aquaculture**, located in Leetown, W.Va. These scientists have developed the technologies needed to identify genes that affect stress tolerance and resistance to disease.

In collaboration with microbiologist **Tim Welch**, Greg has successfully sequenced a lethal bacterial pathogen (*Flavobacterium psychrophilum*) known to cause “cold water disease.” In his article three years ago, Greg requested that local trout farmers send in samples of trout suspected to have cold water disease. Farmers who sent in trout helped to improve the effectiveness of the research. One goal is to create an effective vaccine for this chronic disease, which causes high mortalities in trout fingerlings.

Another area of aquaculture genomics, supported by ARS, is focused on developing a strain of trout that will grow rapidly on plant proteins and oils rather than marine-based (fish meal) proteins and oils.

This effort could reduce the demand for, and high cost of, marine-based proteins. Scientists in Idaho are studying the genetic ingredients of trout to determine if some strains will perform better on plant-based diets.

More information on ARS can be found in the August 2008 *Agricultural Research* publication or on the Web (www.ars.usda.gov/ar).

2009 Aquaculture Forum

By Ken Semmens

(Aquaponics from page 1)
flowing past the plant roots, was an important factor. Plants grown at the same velocities as those in the fish raceways (~0.03 ft./sec.) grew faster than those at lower velocities.

Experiments were done to determine the effect of season on the type of crop that may be grown in this system. Cool-season crops such as lettuce, broccoli, and cool-season flowers such as Dianthus and Calendula grew well in all seasons, including midwinter. Typical warm-season crops such as basil and dill grew poorly and often failed to germinate even in midsummer when air temperatures were in the 80s. It is expected that other typical warm-season crops such as tomatos, cucumbers, and peppers would be unproductive in this system. Results from these experiments highlighted the overwhelming importance of water temperature when selecting crops to grow in an aquaponic system.

Plant trials of potential cool-season crops were done. In general, most cool-season crops performed well; however, there were some exceptions. For example, spinach germinated poorly, and those seeds that did germinate produced small, unproductive plants. The Asian green, Tat soi, germinated well, but the plants bolted, producing seed heads rather than the leafy greens the plants are known for. The plant trials underscored the need to determine what grows well in a particular system before sowing a large crop.



Root system under aquaponic raft

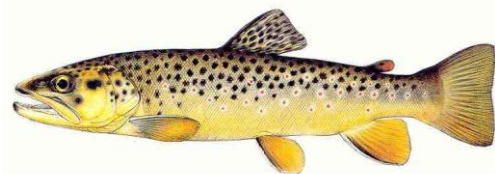
You are cordially invited to attend the 2009 Aquaculture Forum. This annual meeting is designed to inform people about growing fish to eat, to watch, or to sell. Each January, aquaculture enthusiasts and pond owners from West Virginia and adjacent states gather for this event. The **2009 Aquaculture Forum** will be held at the South Branch Inn in Moorefield, W.Va., on **Saturday, Jan. 17**. The day will consist of presentations on a variety of topics, a showcase of West Virginia aquaculture products, posters describing the latest aquaculture research, door prizes, a business meeting of the West Virginia Aquaculture Association, and an opportunity to meet and speak with fish folks from the region. Participants will receive information on a wide variety of topics and learn about where to get fish, feed, supplies, and information about growing aquaculture products. The program will begin at 9:30 a.m. and conclude at 4:30 p.m.

Supplementary to the forum is a field trip to WVU Reymann Memorial Farm and the National Center for Cool and Cold Water Aquaculture. The trip is scheduled for the afternoon of Friday, Jan. 16. Participants will visit a flowing water system for trout production and a national laboratory using technology to improve the genetics of rainbow trout. Field trip participants will depart the South Branch Inn at noon and return at 6 p.m.

This year, there will be no registration fee to attend Saturday's meeting, but a registration fee will be required for Friday's field trip. As more details become available, they will be posted on the aquaculture extension Web site (www.wvu.edu/~agexten/aquaculture/). Information may also be obtained from Ken Semmens (304 293 6131, ext. 4211, or Ken.Semmens@mail.wvu.edu). You may also contact your county WVU Extension office or Becky Casteel (304-293-6131, ext. 4231, or Becky.Casteel@mail.wvu.edu).

The Aquaculture Forum is sponsored by the West Virginia University Extension Service, the West Virginia Aquaculture Association, WVU Davis College of Agriculture, Forestry, and Consumer Sciences, and the West Virginia Department of Agriculture.

Please consider joining us in Moorefield this January!



Three times a charm?

By Ken Semmens

In West Virginia, trout manure removed from the quiescent zone of a raceway is considered industrial waste. Unlike manure from terrestrial animals, it originates in water and is part of an effluent stream. Because trout manure is an industrial waste, spreading it on land as a fertilizer like manures from other livestock is restricted. A bill designed to change this status has been introduced in the legislature for the past three years. Tom Brand, program coordinator for the Davis College of Agriculture, Forestry, and Consumer Sciences worked with the legislature on agricultural issues and led the effort to change the code.

On Feb. 21, 2006, Bill 4678 was introduced into the House of Delegates and was sponsored by delegates Beach, Poling, Stemple, Proudfoot, Argento, Stalnaker, Swartzmiller, Cann, Pethel, Hartman, and Williams. It was referred to the Committee on Agriculture and Natural Resources and then the Judiciary. The bill was “to amend and reenact §22-15-22 of the Code of West Virginia, 1931, as amended, relating to the regulation of land-based finfish aquaculture facilities; and exempting them from certain sludge management requirements.”

The bill did not pass both houses in 2006 so it was introduced again as House Bill 2126 in 2007. It was sponsored by Delegates Beech, M. Poling, Proudfoot, Argento, Stalnaker, and Williams. The bill was “to amend the Code of West Virginia, 1931, as amended, by adding thereto a new section, designated §19-29-6; and to amend and reenact §22-15-22 of said code, all relating to the regulation of land-based aquaculture facilities; exempting aquaculture facilities from certain sludge management requirements; and providing the Commissioner of Agriculture rule-making authority to promulgate rules after consultation with the Department of Environmental Protection, concerning the disposal or application of waste produced from an aquaculture facility.”

It passed the House, but failed to pass out of the Senate Judiciary Committee. There was no apparent objection from the Division of Environmental Protection, the Division of Natural Resources, or the Department of Agriculture. It was not clear that anyone opposed a change in the law. A letter was sent to Jeffrey Kessler, chairman of the Judiciary Committee, W.Va. State Senate asking him why it did not pass his committee. His response was, “I do not have a position on the bill or personal knowledge of the issue. House Bill 2126 came to the Judiciary Committee late in the session. No one spoke to me about the bill during the session; therefore, it did not appear to be of critical importance that the Committee consider it.”

In 2008, Tom Brand tried again with House Bill 4411. He expected to have the help needed to prevail. It was introduced by Delegate Stemple on February 5. The bill’s history is described on the Web (www.legis.state.wv.us/Bill_Status/bill_status.cfm). Once again, the bill passed the house and failed to emerge from the Senate Judiciary Committee.

Aquaculture is a new form of agriculture to which regulatory agencies and legislature are not very responsive. If aquaculture is to begin to reach its potential, growers must engage regulators, agriculture leaders, and the legislature.

Title 47 Legislative rule, Bureau of Environment, Division of Environmental Protection, Office of Water Resources. Series 26. Water Pollution Control Permit Fee Schedules

2.8. "Industrial Wastes" means any liquid, gaseous, solid, or other waste substance, or a combination thereof, resulting from or incidental to any process of industry, manufacturing, trade, or business, or from or incidental to the development, processing, or recovery of any natural resources. The term "industrial wastes" includes the admixture of industrial wastes with sewage or other wastes.

Trout School: Sophomore Year

By Rodney Kiser

Last September, the West Virginia University Extension Service – Aquaculture held the first-ever “Trout School” at WVU’s Reymann Memorial Farm. The overwhelmingly positive response generated by last year’s event perpetuated the need for a second year. The name may have changed TO “Trout Culture Workshop” but the results were the same. Twenty attendees spent Oct. 6-7 at Reymann Memorial Farm learning about Marketing, Feeds and Feeding, Flowing Water System Design and Management, Fish Health, Aquaponics, Spawning, and Genetics. In addition, a tour of the production facility and greenhouse, hands-on activities, filleting demonstrations, and a picnic on Monday evening added to the experience. The workshop proved to be a means of allowing trout farmers, industry reps, research specialists, and those just interested in trout production to come together to broaden their knowledge and share ideas concerning trout production. The picnic on Monday night continued to be a highlight of the event offering good food and good conversation. The second day offered presentations on trout spawning and genetics from Caird Rexroad and Jim Everson with the National Center for Cool and Cold Water Aquaculture (NCCCWA). USTFA also sponsored the event. Participants in the 2008 workshop were a diverse group with representatives from West Virginia, Ohio, North Carolina, and Pennsylvania. A notable participant was the State Veterinarian, Dr. Joe Starcher. Kudos to everyone for another memorable event.

Dr. Karen Buzby explains aquaponic research to trout school participants



Why You Should Join the Farm Bureau

By Rodney Kiser

In 1919, a small group of farmers from 30 states gathered in Chicago and founded the American Farm Bureau Federation. Today, Farm Bureau is in all 50 states and is active at the local, county, state, national, and international levels. Farm Bureau has gotten bigger over the years, but one thing has remained the same—its purpose. The purpose of Farm Bureau, as approved by members in 1920, is: “The purpose of Farm Bureau is to make the business of farming more profitable, and the community a better place to live. Farm Bureau should provide an organization in which members may secure the benefits of united efforts in a way which could never be accomplished through individual effort.” That statement was true in 1920, and it is true in 2008.

As aquaculturists, we find ourselves in an agriculture minority. Regulations and the W.Va. state code do not clearly recognize aquaculture as agriculture. It is in the best interest of individuals engaged in aquaculture or any form of agriculture to join their local farm bureau. Farm Bureau offers you the opportunity to unite with like-minded individuals and speak with one voice, and when the Farm Bureau speaks, people sit up and pay attention. In addition, by becoming a Farm Bureau member, you will enjoy benefits related to insurance, communication, finances, health, safety, travel, and vehicles.

So join more than 17,000 member families in W.Va. and the more than 5 million member families in America. Sign up with your county Farm Bureau and become part of the largest state and national agriculture organization. Remember the motto of the WVFB, “We pull the most when we pull together.”

For information about the West Virginia Farm Bureau or for information about joining Farm Bureau, go to the Web site (www.wyfarm.org) or call 800-398-4630.

(Some information contained in this article came from the American Farm Bureau and WVFB Web sites.)

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We encourage contributions to Fish Tales Newsletter by W.Va. residents. If you are interested in contributing, or would like to be put on the mailing list, please contact Dan Miller at dmille31@wvu.edu or call 304-293-4832, ext. 4465. The deadline for contributions to the next issue of Fish Tales is February 1, 2009.

This publication is available, in a printable format, on the Web at:
www.wvu.edu/~agexten/aquaculture/newsletter.htm

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