

# 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.

## Geotube collects trout waste

By Ken Semmens and Dan Miller

Trout farmers managing flowing water systems need ways to collect and manage solid waste. Geotextiles have been used to store and dewater a variety of agricultural wastes. Investigators at the Freshwater Institute have examined the efficacy of geotextiles for removal of solid waste obtained from microscreen filters in a recirculating system. Investigators at the NC State University's Fish Barn have relied on a geotube for over a year to accumulate solid waste in a similar application. WVU investigators wondered if trout growers could use this technology to capture solid waste from the effluent stream leaving the quiescent zone (QZ) as it is cleaned.

The geotextile bag (Geotube®) installed at Reymann Memorial Farm near Wardensville, WV is basically a large, leaky bag sitting on a porous surface. Water laden with solid waste which has settled at the end of the trout raceway flows by gravity to a sludge sump where it is pumped into the geotube. Water leaks out of the bag and solids are retained. This cycle is repeated until the bag no longer has capacity for additional waste.

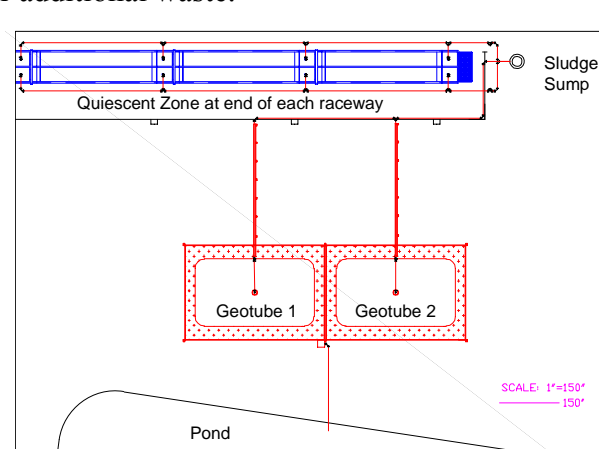


Diagram of system at Reymann Memorial Farm

In this demonstration, a total volume of about 1500 gallons was removed from the quiescent zones at least three times each week. In an effort to maximize recovery of solid waste, flocculant (Hyperfloc® CP625, Hychem Inc.) was added as the water was pumped into the 15' x 25' bag. Drainage pipes in the gravel pad directed water filtered by the geotube to a central collection point (see Geotube on page 3)

## FDA Approves New Drug for Fish

The U.S. Food and Drug Administration (FDA) has approved Terramycin® 200 for Fish (oxytetracycline dihydrate) Type A medicated article for the control of mortality in freshwater-reared salmonids due to coldwater disease caused by *Flavobacterium psychrophilum* and for the control of mortality in freshwater-reared *Oncorhynchus mykiss* due to columnaris disease associated with *Flavobacterium columnare* (New Animal Drug Application 038-439). In addition to these two new indications, the approval allows for removal of the temperature limitation on previously approved salmonid indications, which restricted its use to water temperatures above 48.2°F (9°C).

Terramycin® 200 for Fish is the second drug approved for use during outbreaks of coldwater disease. Untreated, this disease can cause significant losses among salmonids at hatcheries including native species in restoration programs.

Terramycin® 200 for Fish is the first drug approved for the control of mortality due to systemic columnaris disease associated with *Flavobacterium columnare* in freshwater-reared *Oncorhynchus mykiss*. *Oncorhynchus mykiss* includes rainbow, steelhead, and redband trout, as well as other related subspecies. Columnaris can be a problem for trout and other fish when water temperatures are above 14°C.

**Four aquaculture organizations relocate from West Virginia to Pine Bluff, AR**

The National Aquaculture Association (NAA), the U.S. Trout Farmers Association (USTFA), the Striped Bass Growers Association (SBGA) and American Tilapia Association (ATA), will relocate to the Univ. of Arkansas Pine Bluff campus.

Contact information and new (central time ) hours will go into effect July 21, 2008.

**Office hours:** 8 to 4pm Address: P.O. Box 1647, Pine Bluff, Arkansas 71613. **Phone:** 870-850-7900 **Fax:** 870-850-7902

**E-mails:** [naa@thenaa.net](mailto:naa@thenaa.net); [ustfa@thenaa.net](mailto:ustfa@thenaa.net); [sbga@thenaa.net](mailto:sbga@thenaa.net); [ata@thenaa.net](mailto:ata@thenaa.net)

**Web sites:** [www.thenaa.net](http://www.thenaa.net); [www.ustfa.org](http://www.ustfa.org); [www.stripedbassgrowers.org/](http://www.stripedbassgrowers.org/); [ag.arizona.edu/azaqua/ata.html](http://ag.arizona.edu/azaqua/ata.html)



(continued from page 2 Import Permit)

are certified free from IPN, brook trout are another story. Brook trout, the state fish of West Virginia, almost always test positive as carriers for IPN. There are no known sources of IPN free brook trout from hatcheries in the state. Most public and private hatcheries in adjacent states cannot supply eggs which certified free from IPN.

While it is important to protect the industry and the natural resources from non-native fish diseases, it is also important to develop policies which balance risk and the need for trade. Perhaps it is time to re-examine fish health policies and develop the fish health infrastructure for a viable aquaculture industry.

(Geotube from page 1)

where it was discharged to a pond. Influent to and effluent from the Geotube® were analyzed for total suspended solids, BOD<sub>5</sub> and particle size several weeks after installation and 3 months after installation. Samples were also analyzed for NH<sub>3</sub>, NO<sub>2</sub>, NO<sub>3</sub>, and PO<sub>4</sub>. **Dr. Karen Buzby** and **Jennifer Hendricks**, investigators in Environmental Engineering at WVU, conducted this research at Reymann Memorial Farm and at laboratory facilities in Morgantown.

Initial results show that addition of 20 ppm polyDADMAC type polymer with high molecular weight and viscosity retains 99% of Total Settable Solids (TSS) from the sludge waste stream created from the cleaning of QZs at Reymann Memorial Farm. This passive waste containment system successfully managed the intermittent, high volume, low pollution concentration waste stream produced by this flow-through system. Mean particle size was reduced from 379 µm to 70 µm. BOD<sub>5</sub> was substantially reduced.

Effluent nutrient concentrations increased somewhat over influent concentrations in samples taken 3 months after operation. NH<sub>3</sub> concentrations increased from 2.6 to 3.1 mg/L, NO<sub>3</sub> concentrations increased from 0.3 to 1.5 mg/L and PO<sub>4</sub> effluent concentrations increased from 6.4 to 8.9 mg/L. NO<sub>2</sub> concentrations increased from 0.015 mg/L in the influent to 0.39 mg/L in the effluent. This indicates decomposition is occurring within the Geotube® and some nutrients are being released.

**Initial Values**

	<b>TSS</b>	<b>BOD<sub>5</sub></b>
Influent Conc. (mg/L)	1820	548
Effluent Conc. (mg/L)	14.7	70.5
% Removal	99.2	87.1

**After 3 months of operation**

Influent Conc. (mg/L)	1648	341
Effluent Conc. mg/L)	18	55
% Removal	98.9	83.9

Total suspended solids (TSS) and BOD<sub>5</sub> determined after installation and after 3 months of operation

The flocculant system was somewhat troublesome as the flocculant must be protected from freezing. Given that the Geotube® removed over 90% TSS and 65% BOD without flocculant, we chose to discontinue the use of the flocculant when initial supplies were depleted. It is important that the bag have sufficient capacity to receive the entire volume of waste water associated with cleaning QZ in the raceway. The Geotube® was utilized for over a year and performed well. One exception was a few days during the coldest part of the winter when water inside (see Geotube page 4, column 2)

## Import Permit Administration Changes WV Trout Industry

By Ken Semmens

For many years trout producers in North Carolina have supplied the WV recreational market with live trout, but that has changed. Suppliers to fee fishing businesses have had to find trout produced in West Virginia. Changes in the import permit issued by WV DNR have combined with increased transportation costs to fuel a price increase to fee fishing businesses. These small businesses serving local anglers have seen the price of live trout delivered to their pond increase from \$1.70/lb to \$2.30/lb, an increase of about 35%. The trigger to this event seems to have been the concern for VHS, a new disease discovered in the Great Lakes that is slowly spreading to new locations.

From the perspective of the farmers in North Carolina, the problem is not VHS (Viral Hemorrhagic Septicemia), but another viral disease, IPN (Infectious Pancreatic Necrosis). IPN is a pathogen which is relatively common in the aquatic environment and farmed trout throughout the eastern US and is not generally viewed as a serious problem to fish health by trout producers. Even trout produced and distributed (within the state) by WV DNR carry IPN. The problem is not that the fish are unhealthy or show signs of an IPN infection, but that they may test positive as carriers for IPN. If any of the trout from a hatchery test positive, none of the fish from the facility are eligible to be transported into West Virginia under the new permits. Farms which use untreated water from streams which contain wild fish cannot rid themselves of the IPN risk if fish in the stream are carriers for IPN. The end result is that North Carolina trout cannot be sold to fee fishing businesses in West Virginia as they have been for the past half century.

Original text and the new text from import permits issued by WV DNR.

### Original Text

Chapter 20-2-13 of the Code of West Virginia states that importers of fish or viable eggs of the family salmonidae (trout, salmon, etc.) must furnish a statement from a recognized fish pathologist certifying the source to be free of whirling disease, infectious pancreatic necrosis, viral hemorrhagic septicemia or other diseases which may threaten fish stocks. This provision must be met when importing fish into counties that contain trout streams and trout rearing stations. This would include the following counties: Berkeley, Braxton, Fayette, Grant, Greenbrier, Hampshire, Hardy, Jefferson, Mercer, Mineral, Monroe, Morgan, Nicholas, Pendleton, Pocahontas, Preston, Randolph, Tucker, and Webster.

### New Text

Chapter 20-2-13 of the Code of West Virginia states that importers of fish or viable eggs of the family salmonidae (trout, salmon, etc.) must furnish a statement from a recognized fish pathologist certifying the source to be free of whirling disease, infectious pancreatic necrosis, viral hemorrhagic septicemia or other diseases which may threaten fish stocks. **Additionally, importers of certain species from VHS-affected or at-risk regions must comply with the attached U.S. Department of Agriculture Animal and Plant Health Inspection Amended Federal Order (May 4, 2007).**

Health regulations have also created incentive for increased trout production in West Virginia. Trout growers in Pennsylvania have been subject to the risk and uncertainty associated with a VHS outbreak in the great lakes even if their farm is in a watershed near New Jersey. Ted Miller invested in production facilities in West Virginia and the facility may now produce more trout than any other commercial farm in the state. An important reason to make this investment was to acquire production facilities which are not encumbered by the regulations controlling movement of fish from Pennsylvania into adjacent states. This is based on the observation that it is easier to access markets if growers are selling from WV into states which are covered by the VHS ruling rather than selling from a restricted state into an unrestricted state.

Most WV growers rely on groundwater from springs or coal mines which do not contain wild fish. These water sources are more biosecure than surface waters. Unfortunately, this doesn't mean that fish distributed by private producers in WV all test negative for IPN. Though rainbow trout eggs obtained from some commercial suppliers (continued on page 3, column 1)

## Owner of Mountaineer Trout Farm LLC Dies in Raleigh County.

**Teddy Miller** unexpectedly passed away the first week in June 2008. Teddy was one of the most passionate advocates of aquaculture in the state. In 2007 he was featured in the Spring, Fall and Winter editions of this newsletter because he saw the potential for rearing trout in the mountain state and did something about it. He invested his life savings in Mountaineer Trout Co. LLC. In the first 5 months of 2008 he had produced and sold more trout from the facility than had been produced and sold in the best *year* of production.

Teddy leaves behind his wife Colleen and three children. The farm is now managed by another experienced trout farmer who also recognizes the many advantages of mine water in West Virginia.

**Tom Ort** has relocated his family from North Carolina to manage Mountaineer Trout Farm. Tom brought his biological and marketing skills from the privately held Tellico Trout Farm. At Tellico Tom was instrumental in improving production and marketing of trout.

Through his efforts Tellico supplied the Pennsylvania Fish and Boat Commission with quality trout for the past 5 years. Previously Tom managed a federal hatchery that also raised salmonids.

Once the dust settles from the transition at Mountaineer Trout Farm, the availability of trout fingerlings produced in West Virginia should improve. The cooperative relationship that began under Teddy's leadership with Trout Lodge and Angler's Resort is continuing with Tom.

## Trout Culture Workshop

The trout culture workshop at Reymann Memorial Farm has been scheduled for October 6 and 7, 2009. If you want to learn about growing trout, tour an operating facility, and get some hands-on training, sign up today. Information is at the WVU aquaculture web site: [www.wvu.edu/~agexten/aquaculture/](http://www.wvu.edu/~agexten/aquaculture/)

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(Geotube from page 2)

the bag froze. Today the first Geotube® has been taken off line to dry and a second bag will be installed. Once the material in the bag is dry and has been removed, we will attempt to reseal the bag and use it again.

On the whole, this system is reasonably manageable and labor efficient. Short of turning the sludge pump on and off, cleaning the quiescent zones required no additional labor. To this point in time, no labor has been expended to load, apply or dewater the sludge. There was no concern with land applying the waste during the winter months. The prospect of recovering nutrients at the convenience of the operator, and possibly selling them is also appealing.

The Geotube® utilized in this study was obtained through Aquatic Eco-systems, Inc. and is a product of TenCate™ Industrial Fabrics ([www.geotube.com](http://www.geotube.com)). US Fabrics ([www.usfabricsinc.com/products/geotextiles.php](http://www.usfabricsinc.com/products/geotextiles.php)) and other suppliers have woven, non-woven and knitted materials that can also be used for solid retention.



Photograph of Geotube at Reymann Memorial Farm

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**Trout Farm Facility for Sale – Pocahontas Co.**

The facilities consist of two 800-gal. hatching tanks; the remaining tanks are round fiberglass production tanks: 1 x 10,000 gallon; 12 x 1500 gallon; 6 x 500 gallon tanks.  
In addition, a feed shed and a trailer are within the 8' high 3-strand barb wire fence. Land and water is leased at \$100/mo. McNeil Spring is the water source.  
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Fred Hays 304-548-7117, A W.Va. Farmer

We encourage contributions to Fishtales 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](mailto:dmille31@wvu.edu) or call 304-293-4832, ext. 4465. The deadline for contributions to the next issue of Fish Tales is November 1, 2008.

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

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