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Blue Ridge Aquaculture in Ridgeway, already the largest fishery in the nation, builds an innovative new facility.

HOLLY KOZELSKY PHOTOS, MARTINSVILLE BULLETIN

Haze Harris (left) and Darin Prillaman have a conversation inside Blue Ridge Aquaculture's new building.

# A real fish story

These tilapia have nearly reached their 10-week age, the point at which they'll be shipped to fresh fish markets in the northeast.

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The nation's largest indoor fishery is upgrading, and without any examples to follow, Blue Ridge Aquaculture had to forge its own way.

Darin Prillaman is Blue Ridge's director of aquaculture, and Haze Harris is the construction manager, facilities designer and project manager. On a recent cloudy day they gave a tour of the operation out in the industrial park in Ridgeway – not far from the Martinsville Speedway – and talked about their new building that's the first of its kind in America – so innovative that Harris had to come up with its plan from scratch.

In case you didn't know Blue Ridge was started in 1989 as a catfish farm but switched over to tilapia in 1991, Prillaman said. They started with wild tilapia and have not brought in any outside fish since 1997. All the fish are descendants of Blue Ridge's original stock.

And now that tilapia farm is expanding. Construction of a $2.5 state-of-the-art nursery facility to support its existing operations and future growth soon will be completed, and that new facility has two connected buildings, one for production and the other for water filtration.

After construction is completed in January, this facility will replace one building and one greenhouse.

This 16,000-square-foot nursery includes its own water filtration plant to reduce wastewater and increase operating efficiencies by allowing 95% of water to be reused, after it's been filtered and disinfected.

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## Fish

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### By the numbers

Blue Ridge currently produces 20,000 pounds of live tilapia a day, coming out to 5 million pounds a year, Prillaman said. When the new building is used, output will increase by an additional quarter million pounds a year.

The company is in its 19th generation of a genetics program using non-GMO husbandry techniques to develop an improved strain of fish ideally suited for the operating system.

The company's literature says its "nursery was designed to create the ideal conditions for raising tilapia fry and fingerlings. By reducing stress and creating ideal conditions, BRA is able to raise tilapia without the use of antibiotics or hormones."

Blue Ridge Aquaculture employs 45 people and is "employee owned, so everybody takes pride in it," Prillaman said.

The company formed a trucking subsidiary in 2000 to control distribution of its fish to markets. Blue Ridge sells only live fish to fish markets throughout the northeast, but company documents say it's now positioned to expand its product line.

### Cycle of life

The fish cycle begins in a greenhouse-type structure with two long ponds, one along each side, where the breeding stock live.

Tilapia are mouth-breeders, Prillaman explained. A female lays about 2,000 eggs, a male fertilizes them, and then the female takes them back into her mouth.

In nature, the egg-hatching process happens about twice a year. The babies swim out after they have hatched, but they swim back into their mother's mouth for protection from dangers.

"By artificially hatching them, we free them up to make more eggs," said Prillaman – at the rate of every 10 to 14 days.

Each day, eggs are scraped out of the females' mouths and put into a tall, clear, water-filled hatching tube. The eggs remain at the bottom, moving around to the bubbling of the water, and the hatchlings rise to the top.

At the top, the new baby fish are carried over a little waterfall down into a rectangular plastic tub, where they will stay a day or so until they travel through piping to a concrete tank. They'll stay there for a week until they move to the next tank.

The hatchery building, which includes the hatching area and the tanks for young fish, was built in 1997, Prillaman said.

There, like in the other buildings, all of the water in each tank is exchanged for fresh water each day. Thanks to the water treatment system in the new facility being built, only 10% of that water will need to be exchanged.

### Friendly fish

The youngest fish spent their first 6 weeks in the hatchery, then they are moved to tanks in another building until they are ready for market at the age of 10 weeks.

As men walked past the tank, the squirming school of fish seemed to follow them.

"They're already conditioned to come up to you," Harris said, especially if they think you're going to feed them.

In the early days of the company, the fish "jumped all over the place," often landing on the floor, Prillaman said. They panicked when people were around, and noises from trucks being driven nearby or races at the Speedway, scared them so much they wouldn't eat for an hour or two afterward.

The fish in the tanks now are the 19th generation of the original fish brought in, and are calm and apparently accustomed to people, he said.

### Innovative building

The new facility will be much brighter and cleaner than the old ones, where materials are mainly cement and wood.

The new place has flooring and tanks all of cement, which will be coated in epoxy, Harris said. Its greenhouse-style covering is a heavy, super high strength white canvas.

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Blue Ridge Aquaculture Director of Aquaculture Darin Prillaman stands in the egg-hatching area of the hatchery.



"It's not a typical building structure," Harris said. "All the innovation – that was all in-house. I relied on what these guys told me they needed, and I made it all happen."

He had to lead with innovation, because there isn't anything like this to pattern on. However, there are some lessor examples which gave good ideas.

One was at a fish farm they toured in Mississippi. "They have one of these buildings," Harris said. "It caught our eye because of the amount of light that comes in."

The heating system is a series of tubes that run through the concrete floor. Hot water runs through those tubes to heat the concrete, which heats the water in the tanks, Harris said.

One of the benefits of that system is not having to heat the replacement water as much as in the earlier buildings, Prillaman said.

The existing system involves a lot of catching fish by hand. That won't have to happen in the new system, which involves pumping and large fish-travel pipes between tanks. That new system even sorts the fish by size, to put them in appropriate tanks, and counts them as they go through.

The filtration room houses a complete water treatment process. It filters out particles, has a tank with a beneficial bacteria which converts ammonia to nitrite and nitrate and oxygenates the water.

The newly cleaned water returns to the 42 tanks through two main lines on a continual, round-the-clock basis.

For the construction, "we tried to use as many area contractors as possible," Harris said. That ended up being for all aspects except for the building erectors.

Given the coincidence of the timing of construction, it ended up being "a case study in construction management during a pandemic," Harris said.

For the most part, construction still went along smoothly, but there was some delays in getting the canvas covering that, he said, the supplier told him was diverted to supply the temporary hospitals in Central Park in New York City.

### Dialed-in recipes

The company opened its own feed mill, Blue Ridge Aquafeeds, to supply its own food.

The feed mill is supplied by three pipes, Harris said: one for bulk ingredients, which come by the tractor-trailer load; another for macros, which come "in a 1-ton supersack, and micros, the vitamins.

"It's all automated," he said. "We have the recipe dialed in" but can change it as needed.

The mixture can be stored until it is cooked and formed into pellets. Then a fatty coating is added to it so it floats. It's stored in silos until needed.

Twenty-thousand pounds worth of feed is used every day, Prillaman said.

Using their own food, "right off the bat, we had the fasted-growing fish we've had, and we've improved it since then," he said.

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