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GOAL 2016 preview: IPA technology catching on in China

18 July 2016

By James Wright

System said to significantly increase output of freshwater fish like grass carp, catfish



IPA technology on display at the Pingwang Fish Farm 100 kilometers west of Shanghai. Photo courtesy of USSEC-China.

China is the biggest export market for U.S. soy, bringing in about 29 million metric tons (MT) in 2015. China is also a booming market for Intensive Pond Aquaculture (IPA) technology, a floating, in-pond raceway system designed to significantly increase finfish productivity.

It's no mistake that the two are related. In 2013, the U.S. Soybean Export Council (USSEC) established a demonstration facility for grass carp, at Pingwang Fish Farm 100 kilometers west of Shanghai.

As it turns out, the technology developed by Dr. Jesse Chappell at Auburn University (Ala.) is an easy sell, particularly to producers in the high-pressure Yangtze River Delta region, according to Jian (Jim) Zhang, aquaculture program manager for USSEC-China.

A technical seminar produced by the organization in 2012, in addition to the successful demonstration at Pingwang the following year – featuring USSEC-formulated extruded soy-based floating feed pellets – generated a lot of interest in the technology. By 2014, there were 30 units operating in China. The next year that number grew to 100. ([/wp-content/uploads/2016/07/IPA-diagram.jpg](#)).

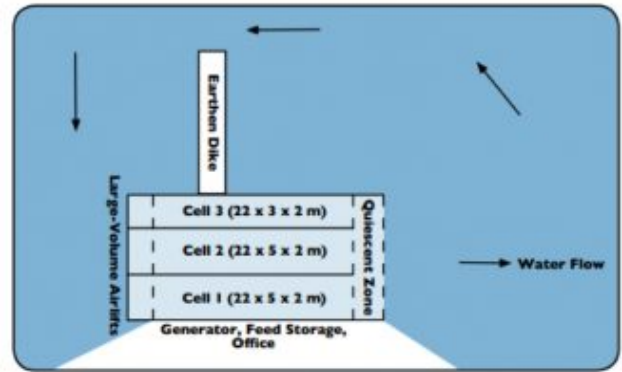
"This year, so far, we can conservatively say there are 150 units in China," Zhang told the *Advocate*, explaining that there are two major reasons why the technology is so successful.

"When we culture fish in a pond, traditionally, the water is still water. The raceway makes the water in the pond become running all the time. A running-water environment, of course, is very beneficial to the fish," he said.

The floating raceway design consists of partially submerged rigid framework, to which a flexible membrane enclosure is attached, and a mesh gate at each end to keep the fish inside the enclosure. An air diffuser grid delivers air and water flow throughout the "water-push" system. Secondly, the system efficiently removes all waste to be recycled for other uses, namely vegetable greenhouses.

"It sucks out all the fecal materials and unused feed so the water won't become eutrophic. There's a lot of nutrients in these materials," he said, adding that no water exchanges are needed during production season. "The carrying capacity is greater than still water."

Zhang will deliver a 15-minute presentation on IPA technology in China on Day 3 of the Global Aquaculture Alliance's GOAL (Global Outlook for Aquaculture Leadership) conference in Guangzhou, China. (To register for GOAL, click [HERE](https://events.r20.constantcontact.com/register/eventReg?oeidk=a07ecfmco1n34dee037&oseq=&c=&ch) (<https://events.r20.constantcontact.com/register/eventReg?oeidk=a07ecfmco1n34dee037&oseq=&c=&ch>). To view the GOAL program click [HERE](https://www.aquaculturealliance.org/goal/conference-program/?) (<https://www.aquaculturealliance.org/goal/conference-program/?>



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"A body of water, say 1 acre, can produce X tons. With this system, we can increase the tonnage by 300 percent – that's a lot of fish," Zhang said. USSEC is also encouraging producers to use "filter species" like bighead and silver carp, species that won't eat aquafeeds but instead clean away phytoplankton, allowing the water to remain capable of high production.

There's a high level of dissolved oxygen, which helps them digest food. They're comfortable, not stressed. No stress, no disease.

The fish being produced using IPA technology are "almost exclusively" for the domestic market, Zhang said. Grass carp, snakehead, largemouth bass and channel catfish are among the species that the technology is most suited to.

Zhang said the Chinese National Fishery Technical Extension Center, under the Ministry of Agriculture, supports adoption of the technology because it is environmentally friendly – extremely limited pollution, improved feed conversion ratios, decreased mortality rates, increased yield and efficient water and energy use – and increases food safety. The government has piloted the technology on several freshwater fish farms in Jiangsu.

"[Safety] is a serious problem in China. A lot of fish look good but are not safe to eat," said Zhang. "These fish are living in a running-water environment all the time, with better exposure to oxygen in the water. There's a high level of dissolved oxygen, which helps them digest food. They're comfortable, not stressed. No stress, no disease. Producers don't need chemicals or drugs for the fish, that's why they become so very safe."

Zhang said the Yangtze River Delta region is particularly suited to IPA technology. "The farmers here are better off, they have the capital, they can make the investment," he said, adding that the average price for one unit (three "cells," with growers, backup generator and the waste-filtering devices) add up to \$30,000 to \$45,000 each, depending on where the units are being placed.

"In China, aquaculture has been developing very fast, but a lot of bottlenecks," said Zhang. "There's a continuous increase in cost of production elements – energy, water, feed ingredients, labor, just about everything. The government is placing more pressure on aquaculture to be more environmentally friendly. If you produce too many fish in a certain amount of space, it will cause pollution. So to tackle these problems, this technology developed in the U.S., IPA, could be a good solution to that."

Zhang's presentation, "Trends in Intensive Pond Aquaculture," will begin at approximately 9:45 a.m. on Thursday, Sept. 22, during a two-hour stretch of the program dedicated to innovation and produced by the *Global Aquaculture Advocate*.

Following a keynote presentation by Mike Velings, CEO of Aqua-Spark, a panel discussion moderated by Advocate Editorial Manager James Wright will feature Anthony C. Ostrowski, Ph.D., CEO of Sino Agro Foods; Gibran Huzafah Amsi El Farizy of eFishery; Michael Tlusty, director of ocean sustainability science at the New England Aquarium; and Dawn Purchase, aquaculture program manager at the Marine Conservation Society in the United Kingdom.



Jian (Jim) Zhang, aquaculture program manager for USSEC-China.

George Chamberlain, president of the Global Aquaculture Alliance, will then present the winner of this year's Innovation & Leadership Award.

@GAA_Advocate (http://GOAL_preview:IPA_technology_catching_on_in_China_System_designed_to_triple_output_of_freshwater_fish_like_grass_carp_catfish Intensive pond aquaculture (IPA) technology, floating, in-pond raceway systems developed in the United States, are being utilized in China. Jian (Jim) Zhang, aquaculture program manager for USSEC-China, says the adoption rate is growing fast, just three years after its introduction. By James Wright China is the biggest export market for U.S. soy, bringing in about 29 million metric tons (MT) in 2015. China is also a booming market for Intensive Pond Aquaculture (IPA) technology, a floating, in-pond raceway system designed to significantly increase finfish productivity. It's no mistake that the two are related. In 2013, the U.S. Soybean Export Council (USSEC) established a demonstration facility for grass carp, at Pingwang Fish Farm 100 kilometers west of Shanghai. 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A running-water environment, of course, is very beneficial to the fish,” he said. The floating raceway design consists of partially submerged rigid framework, to which a flexible membrane enclosure is attached, and a mesh gate at each end to keep the fish inside the enclosure. An air diffuser grid delivers air and water flow throughout the “water-push” system. Secondly, the system efficiently removes all waste to be recycled for other uses, namely vegetable greenhouses. “It sucks out all the fecal materials and unused feed so the water won't become eutrophic. There's a lot of nutrients in these materials,” he said, adding that no water exchanges are needed during production season. “The carrying capacity is greater than still water.” Zhang will deliver a 15-minute presentation on IPA technology in China on Day 3 of the Global Aquaculture Alliance's GOAL (Global Outlook for Aquaculture Leadership) conference in Guangzhou, China. (To register for GOAL, [click HERE](#). 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Photo courtesy of USSEC-China.

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