

RALEIGH, N.C. — More than 250 teachers, representing all 50 states and U.S. flag territories, gathered in Raleigh recently to participate in the first U.S. conference to prepare teachers for teaching aquaculture to high school students.

The teacher inservice conference was the culmination of a four year effort by The National Council for Agricultural Education (The Council) to develop and test new aquaculture instructional materials.

Educators from Pennsylvania received instruction in teaching the new material. National Aquaculture Conference attendees included Jay Eudy, state supervisor, Texas Department of Education and chairman of the Council's Aquaculture Task Force, Austin; Dr. Donald E. Evans, Asst. Dean, College of Ag, Penn State; Tom Zergler, Gardner; Robert Lauffer, Env. Ag. Science Inst., New Holland; Daniel Lynch, Ag Teacher, Kutztown; Joe McMullen, aquaculture project director, Spruce Cozeek; and Ronald Frederick, Ag Teacher, Blue Ball.

Utilizing a grant from USDA's Cooperative State Research Service, the Council worked with

leaders in the aquaculture industry and academia to develop a five-volume curriculum for use in high school agriscience classes. Over the last year, the curriculum was tested in schools in South Carolina, Texas, Pennsylvania, Washington, Iowa, and Indiana.

The Raleigh in-service program involved state teams-agriculture teachers, state supervisors of agricultural education, teacher educators and Extension aquaculture specialists—who will replicate, with other teachers in their home states, the training they received in North Carolina. Newly trained teachers will then teach students.

Aquaculture is the fastest growing area of U.S. agriculture, increasing production at more than 10 percent a year. With increasing consumer demands for fish and shell fish products, and diminishing wild supplies because of pollution and over-harvesting, the U.S. farm produced aquaculture industry, currently valued at \$860 million annually, is poised to expand rapidly, according to USDA and industry analysts.

"We felt it would be advisable to have trained young people who could become part of this emerging industry," said John Pope, executive director of the Council,

"but that's only part of what this program is about."

He said, "In our test schools, we've integrated aquaculture with other areas of instruction. Students are eager to learn, and they say this hands-on applied math and science instruction is fun."



HAPPENINGS

Rotary & 4-H Achievement Night

The Rotary 4-H Achievement Night will be held Saturday, November 7 at 7:30 p.m. at the 4-H Center in Pittsfield.

More than 45 Warren County 4-H'ers and 20 leaders will be recognized for their 4-H achievements in 1992. The 4-H families and general public are invited to attend.

According to Sanford Smith, extension agent, the Warren Rotary Club, 4-H Development

Council, and national companies provide funds for trophy cups, jackets, educational scholarships, plaques, pins, and certificates. Awards presentations will be made by Penn West Credit for outstanding project books, coaches of competitive 4-H teams, and Rotary club members. The program also includes an international spotlight on Australia by 4-H'er Andy Van Ord.

A sundae bar will be served by the Warren County Dairy Princess and maid.

Ultra-Low Flush Toilets

The average household toilet uses 3.5 gallons of water per flush, making it one of the largest sources of water consumption in the home.

As a result of new technology, several manufacturers are now offering ultra-low flush (ULF)

toilets that require only 1.6 gallons of water per flush. One version operates on a gravity-fed system, another utilizes an air pressure system. In terms of removing waste and leaving the bowl clean, these new versions are somewhat less efficient than the high water capacity fixtures. However, the manufacturers stress that they more than meet the standards set by the American National Standards Institute (ANSI). What this means is that consumers may simply have to clean the bowl a little more often.

Conservation-minded consumers who own the larger toilet fixtures have tried such ploys as adding a brick or a carton full of sand to the toilet tank. Because the object displaces water in the tank, it reduces the amount of water going into the bowl with each flush. However, it presents two problems. The first problem is reduced efficiency in terms of waste removal and cleanliness of the bowl. The second is more serious. Sand or decomposing brick can damage porcelain or clog the pipes causing plumbing problems.

The new ULF toilets are more expensive than most conventional toilets. However, the extra cost can be recouped in water savings over the lifetime of the fixture. As concerns for water supply and sewage treatment increase, it is anticipated that some local building codes will mandate ULF toilets. When obtaining building permits for renovation or construction, consumers should check with their local building regulations.

Bats In Your Belfry?

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renheit range, and will roost together in colonies of 30 or more individuals. All male bats are excluded from the maternity colony during the late gestation period before the pups are born in late May or early June. The pups are helpless until about mid-July. It is during these months that female bats congregate in attics or roost in garages or chimneys, generally raising the ire of homeowners.

"Homeowners who try to seal off attic areas when they believe the bats have left for the night, may inadvertently seal in helpless pups."

Through her research, Williams has discovered that placing a bat house on the Southeast side of a structure where it is exposed to morning sun is the best location, since the expectant mothers prefer the warm temperatures.

Working with the Big Brown Bat (*Eptesicus fuscus*) and the Little Brown Bat (*Myotis lucifugus*), two common Pennsylvania species, Williams tested two box designs. The designs, one vertical and one horizontal, are sort of a two-story and a ranch version of a bat dwelling. Williams found that some bats moved out of human dwellings and into the bat boxes, while other bat colonies simply moved between box designs when temperatures were to their liking. Williams says overall, the bats preferred the vertical design because of the varying degrees of temperature found within the structure.

"The horizontal box was consistently hotter than the vertical design, but it was sometimes too hot for the bats and there was no place to escape," she explains. "I believe a modified version of the vertical box where it is made wider, or a horizontal design with a compartment that allows the bats to move into cooler surroundings could be the perfect solution."

After looking at 20 homes, 10 occupied by bats and 10 sans bats, Williams believes it is mostly temperature that draws maternal bats to attic homes. "Attics with bats are consistently hotter than attics without bats. Disturbances didn't seem to matter much and the amount of light in these areas ranged from dimly lit to pitch black," she explains.

Williams plans to continue monitoring homes to determine what site modifications can be made to buildings to render them less acceptable to bats.

"By making human structures less palatable to bats and encouraging them to occupy bat boxes, we can provide an alternative to their destruction," she says.

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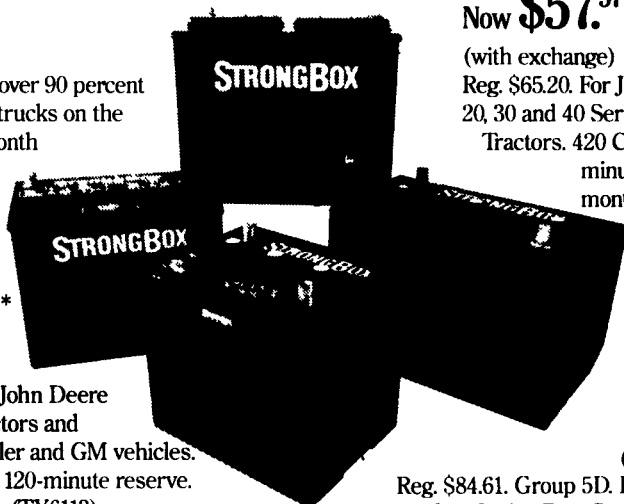
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