



UNIVERSITY OF NORTH CAROLINA SEA GRANT PROGRAM NEWSLETTER

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Sea Grant advisory agent Hughes Tillet lifts a rack of oysters for inspection.

Growing Your Own . . . Clams and Oysters

Inlanders put in their okra and cabbage seeds; folks on the coast are planting seed oysters and clams in an experiment in shellfish gardening on the North Carolina Outer Banks.

The experiment began in the Pamlico Sound when Sea Grant advisory agents Summer Midgett and Hughes Tillet sowed 50,000 clams smaller than half an inch in the sand behind Lawrence Lee Austin's Hatteras home. Midgett and Tillet had intended to scatter the infant clams inside a protective wire pen, but the clams arrived before the pen did. The Sea Grant team learned an important lesson when all 50,000 clams were wiped out; protective pens are important to the success of cultured clams.

That was three years ago and Midgett and Tillet are continuing to learn about clam, and more recently, oyster aquaculture. Through Sea Grant and Pocket of Excellence funds, ten people from Oregon Inlet to Atlantic have started clam and oyster gardens and one—Lawrence Lee Austin—has already reaped the benefits of a harvest. Austin won't say exactly how much he profited from the sale of his cultured clams, but he was encouraged enough to wade through two and a half years of red tape to get a state lease for 12.7 acres of bottom land. Austin plans to gradually find the best places on his acreage for gardening and—if the economics work out—turn clam and oyster farming into a full-time occupation.

(See "From Seed," page 5)



Bringing Clams to the Backyard in Buxton

Barbara and Luther Midgett, of Buxton, raise hunting dogs, bees, vegetables, children and—in a new venture—clams.

“We had what we consider an ideal farming situation in our backyard and we knew another man had farmed successfully in Hatteras,” Barbara Midgett says to explain the 30-by-100 foot clam pen installed behind her home in November 1975. “We’d always raked wild clams so we thought why not call Hughes and Sumner and see if we were eligible for a pilot project.”

Sumner Midgett and Hughes Tillet, the Sea Grant clam farming explorers, looked over the area and decided it looked prime for clam production. They helped the Midgetts build a protective pen of vinyl coated wire. Treated wood pilings were installed about every 10 feet and the structure was given a life expectancy of at least five years, Barbara Midgett says.

“We really don’t have to do anything. We just go and look at them and clear off any debris and watch for crabs.”

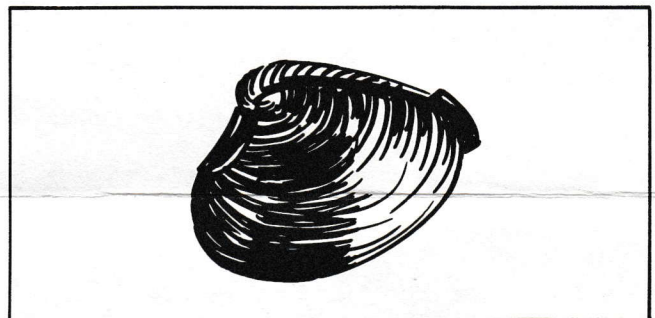
The pen was then divided into seven smaller sections. Two thousand eighth-inch size seed clams were placed in one section, 2,000 quarter-inch in the next and 4,000 three-eighths inch clams in the next. The other four sections were filled with clams with a diameter of five-eighths of an inch. Twenty-five hundred of these clams were put in two parts of the pen and 3,500 in the remaining two sections. Sea Grant will monitor the operation to see which sizes and densities of clams grow best.

“We really don’t have to do anything,” Barbara Midgett says. “We just go and look at them and clear off any debris and watch for crabs. We’ve had low mortality and considerable growth. We look to harvesting cherrystone-size clams 16 months from last November.”

The Midgetts have applied for a lease for five acres of bottom off their own 225-foot shoreline. If the lease comes through they plan to go into the clam business as a sideline. They’re expecting at least 100 per cent profit on their \$300 to \$400 investment and are looking at marketing outside the state, where prices may be higher.

“So far, so good,” Barbara Midgett says of the project. “The clams are doing fine—the weather doesn’t seem to affect them and I don’t think we’ve lost more than 40 or 50 from the total. I’m fascinated by it and I think it’s an excellent idea because there’s a tremendous demand for clams inland and limited space where they can be farmed.

“And anywhere they’re successful it’s additional food supply for the United States.”



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If The Romans Could Do It, Eph O'Neal Thinks He Can Do It, Too

When Ephriam O'Neal looks at the handmade raft floating in a shallow canal near Cape Hatteras, visions of Oyster Bars dance in his head.

The cause of the reverie is 75,000 seed oysters maturing in plastic racks suspended from the raft. Sea Grant agents Sumner Midgett and Hughes Tillet planted O'Neal's oysters in February and May and the shells have already doubled their original thumb nail size.

"I'm telling you they're growing fast," O'Neal says with satisfaction as he surveys his crop.

O'Neal is magistrate in Hatteras and operates a marina. He also fishes in the winter. Several years ago he tried to open an oyster bar but found it difficult to get the oysters when he needed them. He decided to lease some bottom land to plant oysters, but when he learned of the off-bottom methods being practiced in Japan and now on the Outer Banks he saw some definite advantages.

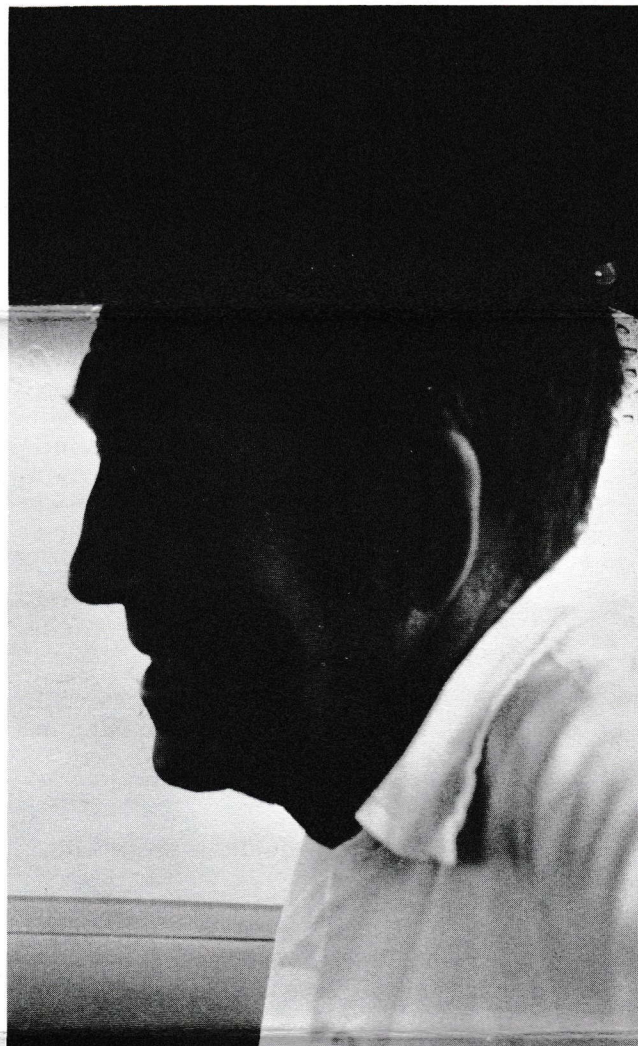
"With these oysters here if you offered me a price and I didn't like it, I wouldn't have to throw my oysters away. I could just leave them in the water growing until the market is right."

The most immediate benefit would be to avoid the hassle of trying to get a state lease—no small chore nowadays. O'Neal simply asked the land-owners abutting the canal for permission to float his raft in the water. He will need a lease, however, if he expands his pilot project.

O'Neal also believes he can avoid two other major headaches—problems with the weather and the market. Because his raft is tied in a protected area it is spared the worst of the elements. The water surrounding the growing oysters is polluted, however, and O'Neal will have to transfer his mature crop to clean water for a period of time before he can sell it for human consumption. But he figures he will only cleanse limited amounts of oysters at one time decreasing the risks of losses in the open water.

He is hopeful he will also be able to protect his crop from the uncertainties of the market.

"We have a lot of potential in the water going to waste and one of the biggest reasons is marketing and controlled seafood pricing," he explains. "If you catch oysters on the bottom, you have a limited amount of time to market them fresh. You have to take what you can get. But with these oys-



Eph O'Neal, of Hatteras

ters here if you offered me a price and I didn't like it, I wouldn't have to throw my oysters away if I chose not to sell them. I could just leave them in the water growing until the market is right."

The ability to control the timing of sales plus the scarcity of local oysters will put the off-bottom oyster grower in a top marketing position, O'Neal says, as long as the demand is there. Demand for oysters has remained stable in the U.S. while the supply has decreased. Oysters are now selling for \$4 to \$8 a bushel, with about 300 oysters per

(See "Rebirth," page 4)



Sea Grant agent Hughes Tillet checks Eph O'Neal's oyster raft. The ropes on the raft are attached to racks of trays holding quantities of small seed oysters. The racks must be cleaned of fouling plants and animals.

Rebirth of a Growing Culture

bushel. The large single oysters get the best prices and, while rare in nature, they are the type easily grown off the bottom.

O'Neal will also be able to harvest and sell oysters year-round while oysters taken from the bottom may only be sold from October through March.

O'Neal is enthusiastic about the future of his oyster business but he concedes there are still several unknowns. The oyster trays and possibly the oysters have to be cleaned while they are growing and neither O'Neal nor Sea Grant knows yet how much labor or time will be involved. Oyster farming has its roots in ancient Rome and Gaul and is practiced widely around the world, but

mainly in countries such as Japan where labor costs are low.

O'Neal and Sea Grant are talking about coating the trays with antifouling paint or pulling them out of the water once a week to discourage algae and other growth. But they have not yet explored what effect these actions might have on the growth of the oysters or the humans who eat them.

Sea Grant and O'Neal are watching the situation closely and watching similar work being done abroad and up and down the Atlantic coast. Hopefully, they will have the answers soon to the questions that will determine whether oyster farming is economically feasible on the North Carolina Outer Banks.

From Seed to Cash: How do North Carolina's New Gardens Grow?

Midgett and Tillet are reluctant to advise everyone to plunge into oyster and clam farming, since the project's economic feasibility is still being tested. But they are hopeful that the pilot oyster and clam plots will achieve the intended goal of providing another way for coastal people to gain income from the water.

"We're basically looking for ways for people to make a little money with only a little money," Midgett says. "You can take a million dollars and do anything, but we're looking for a way for a guy without much capital to do something."

When people approach Midgett and Tillet about farming, the two agents begin by examining the site. Clams and oysters like shallow water with relatively high salinity, strong tidal currents and plenty of food. The gardens must also be in an area where they can be observed and protected from vandals.

If the conditions look favorable, a pilot project can be set. For clams, this means building a pen, three-by-four feet usually, of either vinyl-coated wire or plastic netting and pipe, extending about six inches below the sand and three feet above the water level to keep out blue crabs and other predators.

"You can take a million dollars and do anything, but we're looking for a way for a guy without much capital to do something."

Seed clams—usually about 1,000 from the hatchery in Morehead City—are then tossed into the pen where they bed themselves in the sand. If they die in a week you can be fairly sure you're in the wrong place; although Midgett says he has had clams prosper when moved only 100 feet. After that, it's simply a matter of watching for holes in the wire and philandering crabs, raking off seaweed and waiting an estimated 16 to 18 months for the clams to grow to marketable size.

Farming oysters is a little more involved. Experience and a trip to Japan have shown that oysters grow best when off the bottom and the Sea Grant agents have been experimenting with, among other methods, racks of plastic trays suspended from pontoon rafts. The trays are perforated with small holes which must be kept open to keep water flowing over the seed oysters. Midgett and Tillet began planting oysters last August and they've found the racks of trays need cleaning weekly in the summer to keep algae from clogging the holes. The racks used to date must also be in protected water but Sea Grant is investigating new designs which could be placed in open waters. They

are also looking for other, less expensive materials.

Depending on water temperature, location, salinity and a myriad of other factors, oysters take from one to three years to grow from three-quarter inch to marketable size. And both clams and oysters appear to do better if they are set out in the fall.



"It's a lengthy process and unless you have money to gamble it's best to play it safe," Midgett says. "How much money can you make? It's a good question and there are no truths because everything varies."

"For example, if you bought 1,000 seed clams for a penny a piece, you could sell them for from four to eight cents, depending on who you sold to and when. Then you have to figure in how many you lose, and we've had 95 per cent survival to total loss. If all factors were favorable I don't see why you couldn't get 85 to 90 per cent survival. That brings you \$24 to \$58 profit for 1,000 seed clams. And they claim you can raise 75 clams per square foot although I'd say between 50 and 75 to start and spread them out as they get bigger."

"And, of course, you have to include the investment for the pens and the lease. The state charges \$5 an acre to lease bottom and the applicant must pay to have the land surveyed." The state leases only commercially unproductive and unpolluted bottom land which will be developed to produce at least 25 bushels per acre.

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Midgett personally has no doubts about the feasibility of the clam project, although he thinks the oyster venture is still too young to be assessed.

"It's all in the experimental stage and people getting into it will have to use their own judgment and ideas," he adds.

But using his imagination, he can picture triple decker farming with clams on the sound floor, oysters suspended from wire cages on the pen and scallops on the top.

Persons interested in finding out more about oyster and clam gardening can contact Midgett and Tillet at 473-3937.

Room for Growth: North Carolina Joins the Aquaculture Experimenters

North Carolina is not alone in its quest for practical and economical ways to farm clams and oysters. Work is being done on both the Pacific and Atlantic coasts.

Maine is particularly active in oyster aquaculture and one commercial enterprise, Maine Coast Oyster Corp., is now selling oysters planted with Sea Grant help. The oysters have grown to market size in two years and are selling for 20 cents a piece at latest report. The oysters are grown in floating trays in racks nine-deep. In the winter they are moved to the bottom to avoid problems with icing.

A little closer to home, Frank Wilde is successfully growing oysters in Chincoteague Bay, Va. The oysters are set in single floating trays which are positioned in rows. Wilde grows his crop from spat to marketable plump, single oyster.

Off-bottom culture is also being researched, through Sea Grant, in South Carolina and Oregon.

Clam aquaculture is being explored in Virginia, Massachusetts and Washington. And growing mussels the Spanish way, on rafts, is being tested in Maine.

"There's definitely a potential for growth."

Prognoses for the future vary, but, according to T. Pillay, fishery resources officer with the United Nations, mollusk farming is the second most promising

arena in the aquaculture world.

"There's definitely a potential for growth," says National Sea Grant Advisory Agent Bill Shaw. "Almost all Japanese oysters are grown off-bottom now, for example, which shows it's a way to do it. Japan is about level with us now on oyster production, even though they have much less area, because they're using the third dimension."

In North Carolina the potential is there for more shellfish production, according to Mike Street of the Division of Marine Fisheries.

The state ranks low in oyster and clam production and only plants about 80 acres of bottom to oysters and clams a year, he says. But thousands more acres are available, although more than 60,000 acres of good growing bottom is now inaccessible because of pollution.

"Japan is about level with us now in oyster production, even though they have much less area, because they're using the third dimension."

If the Sea Grant projects pan out and find ways to overcome economic and, in some areas, legal problems, oyster and clam gardening—with the advantages of fast, choice growth relatively free from predators—may find a welcome place on the North Carolina coast.

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