



How to Buy Clam Seed... Without Getting Shucked!

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The hard clam, *Mercenaria mercenaria*, has been an integral part of coastal fisheries and culture for hundreds of years.

Mercenaria has many names. Some are regional, such as quahog in the New England area. Others indicate size classes. Small hard clams below market size are called “buttons” while marketable clams range from the smallest “little necks, necks, or nicks”, then “topnecks”, to medium “cherrystones” to the largest size, “chowders”. This clam has long served as a food source and even had its shell used as money or “wampum” by native American Indians meaning “pay or wages” (Vaughan, Crestwell & Pardee, 1989). To this day, the hard clam serves as an item of desire not for just the baymen who earn their wages harvesting them but for the millions who spend their wages eating them.

Even though the hard clam generated over 53 million dollars in ex-vessel prices in 2000, coastwide, and remains an important fishery resource, natural production in some coastal bays in New Jersey has declined significantly.

Reasons for this decline have been discussed but there has been little success in halting the loss on a large scale. However, enterprising baymen have, for the past 25 years, practiced the culture or husbandry of the hard clam on leased bay bottom. These aquaculture ventures, though often quite risky, have had their successes, and point the way for greater production in the future.

However, everyone who works on the water knows nothing is guaranteed and all precautions must be taken to ensure the best outcome possible.

Since improper site selection or lack of predator control can bring diminished success or even failure, one should try to control as many variables as possible. After procuring a proper site, dedicating appropriate time to learning the grow out process, selecting a feasible predator control system, and establishing an appropriate record keeping system, it is imperative that good healthy seed be procured to get the culture program underway.

This publication is designed to help the first time seed buyer make initial investments, and to alert hatchery operators to methods they can use to help keep baymen as customers after their initial purchases.

“Caveat emptor” or “let the buyer beware” has been a rule since Roman days and is as true now as it was then.

Through controlled-environment spawning of adult hard clams, hatchery technology has reached a level where, through feeding of special algal diets and selection for fast growth, clam seed is available for appropriate bay bottom for grow out to market size. Baymen have the ability to be water farmers and raise clams to market size to help augment catches from the wilds if not rely on clam culture totally.





What Should the Buyer Want to Know?

1. Know your supplier.

- Shop and compare to see what is available first.
- Talk with a seed supplier face to face and get to know him. Be honest and don't be afraid to ask questions. If the answers are too vague or secretive, another hatchery might better serve your needs at this initial step.

2. Ask the hatchery for references on sales to other growers and investigate them.

- Did the seed grow well or have large initial mortalities?
- Were there any real problems with the hatchery?
- Was the price fair?
- Was the count accurate?

Suppliers hesitant to tell about other sales, may or may not be hiding something but requesting references is certainly in order.

3. Shop around for price.

- Don't hesitate to compare prices with other hatcheries. This is business, and profit margins are critical, especially for a beginner.

4. Don't invest heavily in the first year.

- Experience is cheap but clams are expensive. One can learn as much killing 1,000 clam seed as from killing 100,000—except killing 1,000 is much cheaper.

5. Determine what Brood Stock was used?

- Seed with a proven “ancestry” of selected fast growers and winter hardiness are most desirable. The hatchery operator should know the parentage of the seed and openly explain it to the buyer.

Does the seed have parents that are *Mercenaria mercenaria mercenaria*, (typical wild strain of northern hard clam) *Mercenaria mercenaria notata*, (variety that has reddish brown zig-zag stripes on shell) or *Mercenaria campechiensis* (know as the southern hard shell clam). The notata mark is good for ease of identification and as a visual tag. *M. campechiensis* adults are recognized by high ridges and large growth rings but may not be fast growers in this area, and will probably have serious trouble surviving northern winters.

6. When were the clams that produced the seed spawned?

In New Jersey clam seed averages 10 mm growth per year; therefore, 10 mm seed bought in the fall should be from the previous spring, while 10 mm seed bought in the early spring is probably from the previous year, which is perfectly acceptable. Seed purchased in the fall, and known to have been spawned two summers or springs before, would be considered runts or slow growers and not worth the investment.

7. From what sieving is the group of seed which is being purchased?

As with all things in nature clams grow at various rates. The fast growers from particular spawn are sieved out first. Fast growers or “streakers” may yield a faster return on investment, and buying those would be advantageous.

The hatchery operator also knows this and may keep the fastest growers for himself or charge a slightly higher price. The way to avoid this is to purchase an entire lot of very small seed (approximately 1 mm) and do the nursery work yourself. These seed can be very cheap but losses can also be very high.

8. Buy the largest seed available from the hatchery in the first year and some small ones too.

Trying various sizes helps the grower evaluate the site for growth. Losses may be reduced and the potential for return may improve since the harvest time is spread out. Site-specific effects of predators on various sizes of clam seed with your protective devices can be determined. If the planting is of all the same size, especially quite small seed, the potential for a major loss is much greater, and less information on growth and survival would be available.

9. Supervise or recheck the count of the purchase.

Trust everyone but count your change — and your clams. Various methods are used to subsample lots and calculate the total. Always subsample and count three times, then average. Caveat emptor! More on this later!

10. Check to be sure the seed are alive.

- Are they gapped? Dried out? Moist? Cool to the touch? If the seed are dry and warm get out the melted butter and chili sauce since they may not live long.
- Very small seed often won't open, even though they may be dead, because of surface tension on the shell.
- Squish three groups of 10 seed from each lot, if they are small, to see if there really is meat in them. The color of the gut should be brown.
- If the seed are extremely small you may have to use a dissecting microscope to be sure if meat is present.
- Large seed can be dropped on their hinge, pried open with a fingernail or knife, or clicked together to check for "boxes".
- If one is still in doubt place a few in sea water to see if they open and begin pumping or place 10 or 20 on a layer of submerged sand to see if they dig in.
- There should be no foul smell.

11. Prepare site before purchasing seed.

Minimize problems by clearing the plot where the seed is to be planted. Cultivating the bottom with hydraulic manifold and/or rakes will remove unwanted materials (sticks, large shell deposits, broken bottles or cans) and make future maintenance and harvest easier.

12. Have predator control equipment (mesh screens or grow outboxes) ready for placement and plant as soon as possible after purchasing.

Predator screens can be laid out in the field before the clams are brought on site. Then the process will entail rolling the screens back, broadcast planting the seed, recovering the area, and finally checking the plot for predators that may have slipped in while planting. They must be removed or killed at this time.

13. Transport seed properly.

- Clam seed should be kept cool, moist, and out of water. A cooler with ice on the bottom covered with cardboard provides a good base on which to sit a bag of seed. Be sure the cardboard is thick enough so the ice doesn't freeze the clams.
- While transporting, keep the cooler out of the sun.
- It is preferable not to put ice on top of the seed.
- DO NOT USE DRY ICE. It is too cold and when it thaws the carbon dioxide gas released will asphyxiate the clams.



14. Plant clams as soon as possible.

- If you have everything prepared at the site, the clams should be planted the day they arrive.
- Consider alternative temporary storing facilities if a storm prevents immediate planting.
- If small seed was purchased for placement in a nursery system, is the system ready?

15. Keep good records about the purchase, planting, and growth of your seed. (See "Recordkeeping for Shellfish Aquaculture" by Gef Flimlin, RCE Bulletin E280).

Tips for the Seller

1. Be honest and open.

- Repeat customers are developed with honesty.

2. Know the capability of the buyer.

- Does the buyer have previous experience with clam culture? If he is purchasing very small seed, does he know and practice good nursery techniques? Does the customer have good year round knowledge of his site?

3. Advise caution on initial purchases.

- Remind the customer that there are **no** get-rich-quick schemes in aquaculture. Advise that culturists should learn with small lots and don't mislead a customer with stories of fantastic returns. Be realistic! Explain that many hatcheries and growers have gone out of business. Urge the buyer to keep good records.

4. Promote good predator control techniques.

- Giving a list of suppliers for predator screening or even selling it yourself will benefit all involved. The customer's success will benefit the hatchery owner in the future with repeat business.

5. Provide the customer with advice.

- If the seed seller has first hand knowledge of the area he can offer to provide assistance. Alternately, the hatchery could provide a list of individuals knowledgeable of the purchaser's growing area such as marine researchers, extension personnel or other clam culturists for future reference.

6. Be available for consultations.

- Balance free information with your ability to consult for a fee, especially at the customer site. A successful grower's time and experience are worth something too!

7. Take deposits and give receipts to guarantee the deal.

- Set exact times for dealing so that your time isn't wasted or seed condition jeopardized. Be punctual!

8. Develop a standard contract.

- Contracts should stipulate what the hatchery is providing, the ancestry of the seed, the amount of seed purchased and its price, and the limit of liability incurred by the hatchery operator for the viability of the seed after it leaves the hatchery.

Determining an Accurate Count for a Sale

After the quantity and desired size, or sizes, has been established, providing an accurate count is critical. Guessing will not do. Trust everyone but count the seed. Business is Business!

Three methods of counting seed are given in the "Manual for growing the hard clam *Mercenaria*" by Castagna and Kraeuter, and should be examined. They include weighing, using volumetric displacement, and splitting.

A Wet Pack Volume method will be discussed in this publication. Clam seed can be purchased at various sizes and appropriate sized graduated cylinders should be used.

Sieve Mesh Size	Approximate Clam Size Retained	Number of clams per ml
Initial	0.75	2,500
1.0 mm	1.50 mm	720
1.4 mm	2.50 mm	116
2.0 mm	3.30 mm	99
2.8 mm	3.90 mm	45
3.4 mm	6.00 mm	20
5.7 mm	8.30 mm	6

This chart shows how clam size and sieve size correlate. The number of clams per ml may vary from hatchery to hatchery so caution is advised

against using these numbers as absolute values. (from Malinowski, 1986)

There is a big difference in time and effort between counting 20 ml of 12-15 mm clams, as compared to counting 20 ml of 1-2 mm clams. Some counting of clams is involved, and a workable size volume and volumetric cylinder is suggested. Pick a sample size that can be counted without too much trouble. It will be done at least three times with three different samples.

[Graduated cylinders can be purchased from scientific catalogues. A 25, 50 and 250 ml should be adequate for counting and possibly a 4000 ml (4 liter) for the total count. Polypropylene would be a good choice for the large one and clear plastic for the others. If kept out of direct sunlight the plastic will last much longer.]

The procedures listed here assume the clams are graded by size. If there is a large size range, the clams have not been graded and this technique can yield large errors.

The procedure is fairly easy and can be done in a few minutes. First, put some water in the cylinder above the line picked for the sample. With a scoop or a spoon, so as not to bias the sample, take some rinsed-off seed and drop them into the water in the cylinder. Tap them down by rapping the cylinder on a tabletop to compress the clams. Add some more and tap them down. Continue the process until the seed reaches the desired line.

Pour the contents out on a tray and count them. Record the total number, including all of them, whether dead or alive.

Repeat the process with other clams from the batch, at least two more times, using the same volume, and record the average count of the three.

To find the total volume of clams in the sale, divide the average count into the total desired amount and multiply the answer by the sample volume to get the total volume of the sale.

Example:

A customer wants 10,000 6-8 mm clams. The hatchery operator uses a 25 ml graduated cylinder and picks 20 ml as the sample size.

He fills the cylinder with water, adds the clams tapping them down until it fills up to the 20 ml line. There are 114 in the first sample, 124 in the second and 122 in the third. The average is 120-clams/20 ml.

The 10,000 clams desired is divided by the 120-sample average and the result is 83.33. That amount is multiplied by the sample volume; 83.33×20 ml, which equals 1,666.6 ml.

Therefore, from that stock of rinsed-off clams of 6-8 mm, 1.66 liters should give about 10,000 seed. [Remember, one ml is 1/1000th of a liter.]

The packing of the total count should be done similarly to the sampling, using water, rinsed-off stock, a scoop, and tapping to the desired volume.

The seller should always explain the method that was used to the buyer and both should take the samples together and do the math to check the order.

It also never hurts for the seller to throw a few extra in for good measure, breakage, or just to insure repeat business.

Comment and Conclusion

Clam culture and husbandry is growing constantly, yet much is still to be learned. Open communication, trust, honesty, and sharing of ideas among hatchery operators, planters, scientists, and extension personnel will go a long way to keep this industry flourishing.

Fair dealing, accurate counting and a flow of information will make better businessmen out of hatchery owners and baymen.

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