

Marine EXTENSION *in action*

Overwintering of Eastern Oysters: Guidance for Small-Scale Growers

Oyster farmers who want to ensure their product reaches the plate or the market in good health and good time are concerned about successfully raising oysters through the winter. Ideally, a maximum number of oysters survive with a minimum of labor and equipment. Yet many things can go wrong during the overwintering period, and having some options worked out in advance can contribute to a successful season.

As with any farming venture, it is generally a good idea to test methods on a small scale at first, before you (literally) put all of your oysters in one basket. Trial and error at the beginning of your operation can have large benefits later on.

Here are some questions to ask yourself as you begin to consider your options for overwintering oysters:

Is your overwintering site secure?

You want to be certain that nobody besides you is going to make off with your crop.

- ✓ Is your overwintering location subject to disturbance, either accidental or deliberate?
- ✓ If you are using a bottom cage or other structure, is it in an actively fished location?
- ✓ Will you be in or near a navigational channel?

A "YES" answer to any of these questions might be cause to re-evaluate your overwintering site, and perhaps look for alternatives.

Is your overwintering site vulnerable to ice?

- ✓ Assess the potential for freezing on your site. Does it get lots of ice or just a little?
- ✓ How thick is the ice compared to the depth of your site—are your cages well below any ice that might form?
- ✓ Could large chunks of ice (which can devastate a farm site) float over your site during the spring thaw?
- ✓ If you are in an area with limited water exchange, will dissolved oxygen levels be affected?

What are the bottom conditions?

The bottom of a river or bay can vary, even at sites just a short distance away from one another. If you are using gear that sits on the bottom, investigate the type of sediments at your site. Soft sediments can allow some types of equipment to become buried, potentially suffocating your oysters. On a very “bony” or rocky bottom, it may be difficult to set gear level, and may increase the chance for lines to chafe and break. Remember that bottom sediments are often a clue to what kind of current and weather a location is subject to: slower and more protected waters will have fine-grained, soft sediments on the bottom, whereas areas of high currents, tidal action, or storm surge will often have harder bottom, since the finer grained sediments are carried away.

Are your oysters getting covered with fouling organisms?

Fouling organisms such as tunicates and algae will continue to grow during the winter months. Even though your oysters may not be respiring much during the winter, it is best to avoid high-fouling locations. Fouled cages are heavy, and can be difficult to bring to the surface in the spring.

Do you have access to your oysters in the winter?

Will you be able to reach your overwintering location when you need to put the oysters to bed and bring them out of hibernation? You also may need to access the site during the winter months for maintenance.



Other Considerations

Timing is everything!

When to put your oysters into overwintering and when to bring them out is an important consideration. In general, water temperature should be between 36° and 40° F. Try to avoid days that have excessively high or low air temperatures; 30° to 40° F is a good range. While it is possible to pack your oysters very densely in an overwintering cage, it is important that you winterize them only after they go dormant, and bring them out before they increase their metabolic activity (before the water temperatures reach much over 40°). Otherwise, the oysters could be struggling for oxygen and food, especially when at high densities in an overwintering cage. If your oysters accidentally become frozen during the winter, do not panic. They can withstand some freezing if handled minimally, and not physically damaged.

Don't bother the oysters while they are sleeping!

Since oysters reduce their feeding and respiration in cold water, they have limited ability to withstand handling or temperature stresses, or to repair their shells if they become chipped or damaged. It is recommended that oysters are not disturbed after they are put to bed for the winter. If you are going to want to retrieve some oysters during the winter, try to arrange separate lots of oysters, so that you disturb only the ones you want to eat.

Overwintering Options

If you have decided that your current location is too risky for overwintering, you will need to find another spot. Typically, oyster farmers opt for either deep water where the oysters will be below any threat of ice ("wet"), or cold storage ("dry"). No strategy or equipment is perfect, and not all will be universally acceptable. Your individual situation will dictate what method you finally decide to use.

Here are some options:

Use bottom cages.

Bottom cages offer security, some protection against silting (provided they keep the oysters off the bottom), and a potentially easy way of handling your crop. For these reasons they are a good option for some growers. Be sure that the cages are submerged deep enough to avoid being crushed or carried away by ice, and that surface buoys (if used) also will not be carried away by ice, taking your cages along with them; "winter stick" buoys that stand up in the water are recommended. If you are able to avoid using surface buoys, then cages can be sunk on a groundline, and you can grapple the line up in the spring. SCUBA diving or galvanic time-release (GTR) mechanisms are also options for retrieving un-buoyed cages.

Place your oysters in "dry" storage.

Eastern oysters can survive many months in cold, humid air storage (Hidu et al., 1988). Commercial and recreational growers have used this method to overwinter oysters with good results. A commercial cooler or refrigerator can be used to hold oysters indoors; as long as the temperature is between 32° F and 38° F (0° C to 3° C), the temperature will not fluctuate too much, and there is drainage available. Put a little burlap or other material over the oysters to keep them moist, but not completely wet, and eliminate any chances for standing water. If possible, watch the oysters for mold; if mold starts to develop,

reduce the moisture content of the environment. Most importantly, be sure that your oysters are stored cupped side down: this keeps the 'shell liquor' in the oysters, and prevents them from drying out.

Pit your oysters.

Essentially, this means putting your oysters in a hole in the ground until springtime. The pit should have good drainage, be below the frostline, and should stay in the appropriate temperature range (you can line the sides of the pit with rigid foam insulation to moderate temperatures). Layering the oysters as described above and using damp burlap can also help.



Hang your oysters from a structure.

Cages, trays, racks and similar gear sometimes can be attached to structures such as piers, wharves, and rafts. These structures are stable platforms, and often provide good work surfaces. An easy and effective approach is to use lobster bait-bag material as a 'sock.' These bags help to keep some pressure on the shells, reducing the energy the oyster expends to keep its shell shut. Tie a knot in the bottom, and stretch the material on a four-inch or six-inch PVC pipe, then dump the oysters down into the tube. As the tube fills, remove the PVC pipe, and you'll have a socked-up group of oysters in a size you can handle efficiently. These can be hung from a dock or pier, though care must be taken to be sure that the oysters are low enough to prevent any ice damage.

Switch to another site.

Moving your equipment is an option, but you will need to plan well in advance. If the site you use during the growing season is not well suited for overwintering, you may need to find another location. All of the above considerations will still apply, and you should be sure that you are properly permitted for the new location and equipment.

*Make sure you have
a permit!*

Lease regulations will specify the location and type of equipment you can use. Deviations from what you are permitted may be in violation of your lease. If you are unsure, contact your local marine patrol officer, or the appropriate state regulatory agency (e.g., Maine Department of Marine Resources).



REFERENCE

Hidu, H., S. Chapman and W. Mook. 1988. Overwintering American oyster seed by cold humid air storage. *Journal of Shellfish Research* 7:47-50.

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