Maryland Sea Grant Extension Factsheet
OYSTER AQUACULTURE

Purchasing Seed Oysters

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Background

For many years oyster planters have had to purchase seed oysters primarily from naturally producing areas such as the James River in Virginia. Recent development of commercial hatcheries for seed production has given planters more flexibility in choosing where to purchase seed, though it has also led to some confusion in making cost comparisons. For example, natural seed is sold by the bushel, while hatchery seed is sold by the thousand count. The oyster planter must, therefore, look at different factors that make up the actual cost of the seed. This brief guide offers some practical advice on buying natural and hatchery seed oysters and gives examples that should enable planters to compare price and quality differences.

Natural Seed Oysters

Maryland law currently prohibits the sale of seed oysters from public seed areas unless one million bushels have been moved for the public fishery. This restriction has effectively removed the option of obtaining seed from Maryland waters since the state has neither had the seed nor the money to move such a large number of oysters. The most consistent supply of seed oysters has been the James River area of Virginia.

Counting Spat

When purchasing naturally produced seed, several factors have to be considered. The spat count per bushel will vary between years and among areas; therefore, simply buying seed by the bushel is a poor indicator of quantity. The buyer should visit the site he is interested in purchasing seed oysters from and work up a spat count for comparison and verification. This can be done by counting the spat in several samples as follows.

First, fill a bushel basket with seed. Count the number of spat on each shell; add up these numbers for your total number of spat per bushel. (Some planters prefer to work with half bushel samples; in this case, multiply the total number of spat per half bushel by two.) Repeat this procedure several times, add the total from each sample, and divide this total by your number of samples.

Costs

In addition to the purchase price of seed oysters, other costs have to be considered in the total price.

Export Tax. Twenty cents per bushel on seed oysters shipped out of Virginia from public oyster grounds.

Graduated Tax. For seed oysters taken from any public rocks, beds or shoals in Virginia other than the James River seed area or other seed areas designated by the Virginia Marine Resource Commission (VMRC), the tax is fifty cents per bushel.

Selling Price of Oysters	Graduated Tax Per Bushel
$1.50 or less	$ .05
$1.51 through $2.50	$ .10
$2.51 through $3.50	$ .15
$3.51 through $4.50	$ .20
$4.51 through $5.50	$ .25
$5.51 through $6.50	$ .30
$6.51 or more	$ .50

For seed oysters from the James River area or any other designated seed area the tax varies with the selling price of the seed per bushel. The current price structure is as follows.

Transportation. Another major cost to consider in obtaining natural seed is transportation. This will usually be by large boat which will obtain the seed and transport it to the planter's grounds where it will be washed overboard. The farther the distance necessary to transport the natural seed the more expensive it will be. Also keep in mind that the lower the spat count the more expensive it will be to transport the natural seed since there will be fewer spat per volume of shell to be moved.

Trucking is another option for the planter but this may be quite expensive for many areas because of the distance between the Virginia seed areas in the James River and many of the oyster grounds on the Eastern Shore. There is also the additional labor and handling which has to be considered in transferring the seed from a truck to a boat for final planting on the grounds.

Permits and Regulations

Permits are required for removing oysters from Virginia and are issued by the inspector from whose district the cargo is to be taken after payment of the required taxes per bushel. For questions and clarification of Virginia laws, contact the Virginia Marine Resources Commission (see page 5).

Maryland law requires that seed oysters shipped into the state between May 1 and September 30 be inspected by the Maryland Department of Natural Resources (MDNR) for the presence of oyster drills, screw borers or their eggs. MDNR will then issue a certificate attesting that the oysters are free of these organisms. They may seize and destroy infected oysters.

Under state regulations, MDNR must also issue a permit if shellfish are to be imported from another state. The permit will be issued when the MDNR is presented with satisfactory proof that the imported shellfish will not be harmful to Maryland shellfish. For further information, contact the Maryland Department of Natural Resources (see page 4).

Hatchery Seed Oysters

Hatchery produced seed, which is sold by the thousand count, is generally available in late summer or fall. Hatchery operators begin spat production in the spring by conditioning the brood stock for spawning. They must ensure that free swimming larval oysters are fed and must provide clean cultch generally clean oyster shell for the larvae to set or attach to.

After setting, a period of hardening and growout occurs until the spat are large enough to ensure good survival. Spat are usually sold for planting when they are between one half to one inch in length.

Counting Spat

Hatchery spat are sold by the thousand count since they are usually set quite densely on cultch, it may seem that there is less seed for the money when compared with natural spat which are sold by the bushel. However, this may not necessarily be the case. That is why it is important that cost comparisons with natural seed be made in terms of cost per thousand spat.

Cost

In recent years, the cost of hatchery spat in Maryland has been $3.50 per thousand. Since hatchery spat are set more compactly than natural seed, they are relatively less expensive to move transportation and planting are frequently done in smaller boats and trucks than with natural seed. Lower transportation costs are especially helpful for planters with small acreage who cannot afford full boat loads of seed.

Remote Setting

A third method for obtaining seed, one currently being refined in Maryland, is remote setting. With this method, the planter buys free swimming eyed larvae from the hatchery and releases them in a tank at his own site for setting on cultch.

In remote setting the planter prepares cultch and is responsible for setting, hardening and growout. The hatchery operator is responsible for conditioning, spawning and larval care. This division of labor is logical and allows the hatchery operator to devote more time to the production of larvae rather than expend a great deal of time to caring for the spat until they are ready to plant.

Advantages of remote setting are

- lower seed costs
- setting oysters on planter's own cultch
- choosing densities of spat on cultch
- better care for newly set spat

To set oysters, planters will need a tank, clean cultch (usually oyster shell) in a container (wire or plastic baskets or plastic mesh bags), filtered local Bay water of sufficient salinity, and an air pump to keep the larvae in circulation.

Eyed larvae can be purchased in Maryland for about $150 per million and, in some parts of the country where the process is used extensively, for as little as $80 to $100 per million. Some hatchery operators will also guarantee that a certain percentage (for example, 20%) of the larvae will set and become spat. Even with the additional expense of cultch material, remote setting could become an attractive alternative for planting oyster seed.

For more information on remote setting, contact the University of Maryland Sea Grant Extension Program (see page 5).

Quality Considerations: Natural and Hatchery Seed

While accurate spat counts are important, it is equally important to ensure that spat are of the best quality available. Environmental conditions could exist which would result in significant mortalities of the oyster seed after transport. As with any major purchase you should take care to examine the product and to investigate the reputation of the seed producer. With few exceptions, bargain priced seed are anything but a bargain. Take into consideration the following cautions:

1. **Know the seller.** If you intend to purchase spat from a seed producer new to you, check his reputation. Ask for the names of some previous customers, especially any in your local area. Follow up with phone calls and ask about the accuracy of his spat counts and the quality of the seller's spat.

2. **Examine oysters prior to purchase.** Check for an abnormally high number of dead or weakened spat. If you have no experience with this, contact your state management agency and inquire about problems with oysters from that area. Also, request reports on disease incidence in the area. Both Maryland and Virginia have ongoing monitoring programs for shellfish disease.

3. **Avoid moving oysters during times of stress.** Extreme heat and dessication may result in the loss of a large portion of your purchase.

4. **Make sure that spat are not moved from an area of deteriorated water quality or that they are not moved to an area of poor water quality.** Heavy summer rains can lower salinity and raise water temperatures, leading to poor spat survival and growth.

Cost Comparisons: Natural and Hatchery Seed

To compare prices of natural seed with hatchery seed, convert the cost of natural seed per bushel to its cost per thousand spat. First, add up the costs of the following:

- price of the natural seed per bushel
- applicable taxes
- transportation costs of delivered price per bushel

Divide the total cost by the spat count and multiply by 1000 to obtain the cost per thousand. See formula at right.

Formula

$$\frac{\text{Seed Cost (per bushel)} + \text{Transportation (per bushel)}}{\text{Spat Count}} \times 1000 = \text{Spat Cost per Thousand}$$

Example

Let us say you have the opportunity to purchase James River seed oysters for $2.50 per bushel with a count of 900 spat per bushel. You find that the transportation cost is $1.00 per bushel by the boat load. See "Cost of Spat," at right.

Cost of Spat

$2.50 per bushel for seed
.20 per bushel export tax
.10 per bushel seed tax, James River
$1.00 per bushel freight

TOTAL = $3.80 per bushel delivered

$3.80 per bushel divided by 900 spat per bushel = .00422 x 1000 = $4.22 per thousand.

Table 1, below, may be useful in comparing prices between natural and hatchery seed. In this case the price per bushel is shown as quoted on the seed grounds. Applicable taxes have been applied and transportation costs have been figured at $1.00 per bushel. This then gives the delivered price per bushel as shown in parentheses.

Variations in spat count per bushel are applied to show the true cost of spat per thousand. Price per bushel and spat counts which fall between the numbers shown can be interpolated quite easily for comparison.

Using this table you can see that seed costs of $2.00 per bushel at the seed grounds and a count of 800 spat per bushel would cost $4.13 per thousand. If you had a choice between this and hatchery seed produced locally at $3.50 per thousand, the hatchery seed would be more economical. (This does not include transportation costs of hatchery seed.)

Conversion Table: Spat Price Per Bushel Vs. Price Per Thousand

Price per bushel at the seed grounds	2.00	2.50	3.00	3.50	4.00	4.50	5.00
Delivered price per bushel (includes taxes & $1/bu. freight)	(3.30)	(3.80)	(4.35)	(4.85)	(5.40)	(5.90)	(6.45)
Spat Count	Actual Price Per Thousand Spat						
400	8.25	9.50	10.75	12.13	13.50	14.75	16.13
600	5.50	6.33	7.25	8.08	9.00	9.83	10.75
800	4.13	4.75	5.44	6.06	6.75	7.38	8.06
900	3.67	4.22	4.83	5.39	6.00	6.56	7.17
1000	3.30	3.80	4.35	4.85	5.40	5.90	6.45
1200	2.75	3.17	3.63	4.04	4.50	4.92	5.38
1400	2.36	2.71	3.11	3.46	3.86	4.21	4.61
1600	2.06	2.38	2.72	3.03	3.38	3.69	4.03
1800	1.83	2.11	2.42	2.69	3.00	3.28	3.58
2000	1.65	1.90	2.18	2.43	2.70	2.95	3.23

Conclusion

Oyster planting, like any business, requires good management techniques. One way to increase profits is to reduce costs. Comparison shopping for seed as well as for equipment is one way to keep costs within acceptable limits.

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For More Information

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