

## Early Spat on Shell Setting

### Background:

Setting for spat on shell typically begins when water temperatures reach about 20° C. This optimal temperature is normally reached in Virginia's climate by May. Setting spat on shell is completed by September; this gives the spat just enough time to grow before the cold of winter puts them in hibernation. Hatcheries start spawning oysters as early as February. By heating the water and adding food they can successfully produce millions of larvae during the cold winter months. When the ambient water temperature rises it brings more food but in many cases poor water conditions. Unfortunately, in the heat of summer such as August, sometimes hatcheries are unable to produce masses of larvae. If the setting season and availability of oysters from hatcheries time frame can coincide there would be more larvae to set. This would also extend the Growth season for spat by at least a month.

### Purpose:

- 1.) Determine if setting earlier is efficient in extending the setting season through success rates.
- 2.) Determine is setting earlier efficient financially.

### Methods:

- 1.) Used clean oyster shell that had been sitting in the sun for at least a year.
- 2.) Filled cages with shell and put in tanks. We used 3 4000 Gallon Tanks.
- 3.) Filled tanks two days before receiving eye larvae. Water from Robinson's Creek was filtered down to 10 micron. One 3 Phase aquaculture heaters were turned on each tank. The air and water were off. It took the full two days for the water temperature to reach 75°.
- 4.) Water temperature and salinity recorded daily
- 5.) Received larvae. Brought to room temperature; once acclimated put in tank and cover.
- 6.) Next morning turned blowers on.
- 7.) After three days turned pumps on. Tried to slowly bring down water temperature. About 5° C a day.
- 8.) Days 6-7 drained tanks. Removed 50-100 shells per tank, stored in labeled bags, and hung from dock. Saved them for more accurate counting later.
- 9.) Planted shells in designated areas.

10.) After about two weeks checked shells in bag for spat and count.

#### Summary of Data Collection/ Analysis:

The first set date was April 20, 2013. 21 Million Eyed larvae were set from Oyster seed holdings. The larvae were separated between 3 tanks; this put roughly 7 million eyed larvae into each 4000 gallon tank. After 3 days the water to the tanks were turned on. After 13 days the shells were planted in the river. Ambient water temperature during this set was 64.9° F. 96 shells were saved to be counted at a later date, when the spat was bigger and more easily visible. The average count of spat per shell was 3.5. Setting rate of 5%.

The second set was on May 5, 2012. 21 million eyed larvae were set from oyster seed holdings. The larvae were separated into three tanks, putting roughly 7 million eyed larvae into each 4000 gallon tank. After 3 days water to the tanks was turned on. After 10 days the spat on shell was planted. Ambient water temperature was 71.6° during this set. 98 shells were saved to be counted. The average spat per shell was 7. The setting rate was 9%.

This concluded our sets with heated water. The ambient river temperature was high enough where it was no longer necessary to use the heaters. This was an unusually warm winter.

#### Conclusions:

Over the summer we continued to set oysters. Our highest set rate was 18% in August. At this time ambient water temperature was 76.8°. 10 million eyed larvae were set from Oyster seed holdings into 3 (4000 gallon tanks). Our worst set of the summer was in June when our set rate was 2%. Ambient water temperature was 83.2°F. Our average set rate for the season was 7.40%. Our first two sets with heated water fell slightly below this average. However difference is not significant.

In determining cost difference between heated tanks and non-heated tanks, power bills were analyzed. In April 2012 594.07\$ more was spent on electricity than in 2011. In May 2012 111.64\$ more was spent on electricity than in 2011. The ambient water temperature was warmer in May which required less energy to heat the tanks to 75°F.

Setting in the earlier months was successful. The setting rate was consistent with what we saw over the warmer weather months. The small change in electricity costs was minimal and insignificant. We plan to continue setting in the colder months to take advantage of larvae available early from local hatcheries.