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Results of Planting Cultchless Spat in Buckners Creek off Nomini Creek on 14 June 1979

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Results of Planting Cultchless Spat in Buckners
Creek off Nomini Creek on 14 June 1979

By

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and

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COMMONWEALTH of VIRGINIA

Virginia Institute of Marine Science

Gloucester Point, Virginia 23062

WILLIAM J. HARGIS, JR.
DIRECTOR

Phone (804) 642-2111

December 21, 1979

79-1

The Honorable James E. Douglas, Jr.
Virginia Marine Resources Commission
P. O. Box 756
Newport News, Virginia 23607

Dear Commissioner Douglas:

Enclosed is our report on the cultchless spat planting in Buckners Creek off Nomini Creek in June 1979.

The spat was delivered in good condition and the planting was efficiently carried out. However, all the spat died.

We do not think that this experiment is at all indicative of the potential of hatchery seed. It is quite probable that if this seed had been planted in late fall on a shelly bottom, the results would have been different. Also, many hatcheries are doing away with the cultchless technique and are setting the larvae on bits of shell.

We were pleased to assist you in this study and if there are any questions we will be glad to discuss them with you.

Sincerely,

Dexter S. Haven

Dexter S. Haven, Head,
Department of Applied Biology

DSH/gbr

Enclosure

cc Dr. Herbert Austin

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INTRODUCTION

On Thursday 14 June 1979, the VMRC planted about 283,000¹ cultchless spat in Buckners Creek off Nomini Creek. The planting area (1/2 acre) had a firm clay-sand bottom devoid of oysters and vegetation. A few shells were scattered over the area.

The spat when delivered to the VMRC bulked about 5½ bushels and arrived in 6-8 baskets. No gapers were observed by Mr. Kendall. Moreover, most of the spat seemed to be moist and in good condition. Mr. William F. Carroll, representing the CEDA Corporation who sold the oysters to the VMRC, delivered the spat.

Mr. Kendall took a random sample of the spat from each container when they arrived. Counts of this sample averaged 86¹ spat per quart.

¹Estimated by VIMS; needs verification by VMRC.

Planting

All aspects of planting went smoothly. The weather was sunny with a light SE wind, and at planting time (1300-1330 DST) the tide was about low slack. The salinity was about 4.1‰. Depths were 6-8 feet. The spat was dropped over the stern of a boat by VMRC personnel into the water so the propeller wash scattered the spat over the bottom.

Sampling Methods

The half-acre plot was gridded into 20 squares; ten of these squares, chosen randomly, were sampled on four successive dates.

The bottom samples were obtained by a suction sampler operated from a VIMS research vessel. In taking the samples, the vessel was anchored near the center of each of the squares and the suction head of the sampler was raised and lowered ten times (in a different location each time). The total area of bottom sampled on each sampling date was 13 ft².

The samples of bottom material collected by the suction sampler in its 1 mm mesh collection bag were returned to the laboratory where the oysters and shell material were sorted, counted, and measured.

Results

There was a 100% mortality of the planted spat by 30 August (Table 1).

The initial density based on our determinations was about 10.9 spat/ft² and the average length was 16.6 mm (0.65 inch). By 22 June 1979, density declined to 4.8/ft² with a decline also in mean size to 13.6 mm (0.54 inch). By July density was only 1.0/ft² and mean size showed a further decline to only 10.9 mm (0.43 inch). No live spat were seen on or after 30 August 1979.

On each sampling date large quantities of small broken shells similar in size to the planted spat were raised by the sampler. These had small fracture holes or jagged edges. This damage was exactly like that described in the literature as being caused by blue crabs.

Discussion and Conclusion

There was a 100% mortality of the cultchless spat planted in Buckners Creek. The cause of the mortality was predation by either the blue crab or mud crab which are abundant in the area.

There were several factors which were responsible for the mortalities. The first was the very small size of the spat: 50.7% were less than 16 mm (0.63 inch). Cultchless spat in this size range seldom survive. The small size, however, was not the sole factor responsible for the 100% mortality since some of the spat were over one inch long.

The season when the spat were planted (mid-June) was definitely not optimal since it gave crabs the whole

summer (when their numbers are maximal) to feed on the small spat. Fall planting is preferable since crabs are relatively scarce at this time and the spat can grow.

Another factor which may have contributed to the high mortality was the nature of the bottom. It was firm sand-clay largely free of shells or oysters and natural fouling organisms. That is, there was very little for the crabs to feed on in the half-acre except the planted spat. We speculate that survival might have been better if the seed had been planted in the Fall on a shelly bottom. This would have provided a cover for the spat; fouling growing on the shell would have provided material for the crabs to feed on.

In conclusion, we do not think this test is at all indicative of the potential of hatchery reared spat. It has shown, however, that attention must be given to size of the planted spat, the season and the location where it is planted.

Table 1

The initial size of cultchless spat planted in Buckners Creek off Nomini Bay, Virginia, expressed as numbers and percent of total. Similar data on size, frequency and numbers are given for the various sampling dates.

Length Interval mm	At Planting 14 June 1979		After Planting					
	No. in Sample	% Total	22 June 1979		18 July 1979		30 Aug 1979	28 Nov 1979
			No. in Sample	% Total	No. in Sample	% Total		
0-5	1	0.8						
6-10	23	17.6	20	31.7	6	46.1		
11-15	42	32.3	27	42.9	6	46.7		
16-20	30	23.0	10	15.9				
21-25	20	15.4	5	7.9	1	7.8	None	None
26-30	9	6.9	1	1.6				
31-35	5	3.8						
Total	130	100.0	63	100.0	13	100.0		
Avg. Length mm	16.6		13.6		10.9			
Density ft ²	10.9*		4.8 ¹		1.0 ¹		0	0

*Calculated on the basis that about 238,333 spat were planted on 1/2 acre (21,780 ft²).

¹The 10 samples collected on each date covered 13.0 ft² (1.21 m²).