

NRAC ANNUAL PROGRESS REPORT

Project Title	Comparing the performance of diploid and triploid eastern oysters in the Northeast
Reporting Period	<u>12/1/2020 - 6/30/2021</u>
Author (Chair)	Bassem Allam
Key Word	Oyster, Triploid, Disease, Resistance, Yield
Funding Level	\$97,863
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Project Objectives	<p>The overall objective of this study is to identify and provide the aquaculture industry with improved oyster stocks for growth under various environmental conditions prevailing in the Northeast. Specifically, this collaborative project will use a regional framework to:</p> <p>(O1) Identify the best performing diploid or triploid lines for different culture environments across the Northeast</p> <p>(O2) Evaluate how interactions among genotype, environment, diseases and energy budget affect growth and survival</p> <p>(O3) Maintain the best performing oyster lines for diffusion to growers throughout the Northeast</p>
Anticipated Benefits	The project will identify the most important factors underlying oyster performance in different environmental contexts, including oyster genetic background, ploidy, and prevailing environmental conditions. Superior oyster lines identified in this project will be made available to the aquaculture industry via our outreach and industry linkages.
Project Progress	Oysters from different genetic backgrounds were conditioned and spawned under quarantine conditions at the Cornell Cooperative Extension (CCE) hatchery in Southold, NY, in April 2021. These included diploid and tetraploid NEH (New England Hybrid) oysters,

	<p>diploid oysters derived from Rhode Island, and diploid oysters derived from a selected NY line maintained at the Islip Shellfish hatchery. Breeding followed the scheme depicted in the proposal, yielding a total of 7 oyster lines produced at CCE (3 hybrid triploid lines, 3 hybrid diploid and a purebred NY diploid). Subsets of larvae were evaluated for resistance to bacterial infection under laboratory conditions (data being compiled). Larvae were settled following industry standards, and postsets were grown under controlled hatchery conditions until they reached 1-mm in width. The seed was then tested for pathology (export certification) and aliquots from each group were moved to each receiving state (RI, NJ and MD, and subsets kept in NY) for nursery culture and subsequent growout operations. Additional purebred oyster seeds from each receiving state have also been secured and are being grown in their respective states (to be used as local controls). We expect field deployment to occur in late August.</p>
<p>Accomplishments:</p>	
<p>Outreach Overview</p>	<p>The project is in its initial stages and outreach has been so far limited to the communication of our research plans. For example, a graduate student working on the project recently contributed a presentation to the “Meet Your Oyster Farmer – Summer Series” events organized by NY SeaGrant where we presented project objectives and progress so far.</p>
<p>Targeted Audiences</p>	<p>Our main target audience is and will continue to be farmers. We regularly hear about mortality events in oyster farms and these are often the result of the use of ill-adapted stocks. We hope to contribute to the education of regional farmers about the adaptability of the various oyster stocks available to different growing regions.</p>
<p>Outputs:</p>	<p>Nothing yet to report other than production of experimental oysters.</p>
<p>Outcomes/Impacts:</p>	<p>We connected with the industry (several industry members are partners on the project), through formal and informal meetings and discussions and exposed the research activities underway and the anticipated outcomes. Measurable impacts of the research activities themselves in terms of providing superior oysters are not expected before the next reporting period.</p>
<p>Impacts Summary</p>	<p>Provide short statements (2-3 sentences) about each of the following: (pre-established fields for Researchers to complete short statement answers)</p> <ol style="list-style-type: none"> 1. Relevance: High variability in oyster farming success is common and the project aims to identify biological (genetic background, ploidy) and environmental factors that could improve productivity. 2. Response: Diploid and triploid oysters derived from different genetic backgrounds have been produced and are being grown for field validation and performance assessment.

	<p>3. Results: Project is in early stages and results from larvae performance are being compiled and analyzed.</p> <p>4. Recap: Field testing is ongoing to identify superior oyster stocks for culture in various Northeastern states.</p>																						
Publications	Nothing to report yet.																						
Students/Participants:	<p>Provide the following information for every student that worked with you during the reporting period:</p> <ul style="list-style-type: none"> • Name: Christopher Brianik • Whether Degree was completed during the reporting period (name, yes/no): No (the candidate passed his qualification exam and is now building his PhD dissertation proposal) • New or Continuing Student: New • Capstone/Thesis Title (actual or anticipated): <u>Tentative title:</u> Strategies to optimize oyster aquaculture in New York and the region • Date of Graduation: NA (2023?) • Provide link to thesis/dissertation document: NA 																						
Partnerships	List any partners that you worked with on your project. Provide the following information for each Partner:																						
	<table border="1"> <thead> <tr> <th>Partner</th> <th>Specific Type</th> <th>Level</th> <th>Nature of Partnership</th> </tr> </thead> <tbody> <tr> <td>Paul Rawson</td> <td>Academic</td> <td>Regional</td> <td>Research Collaborator</td> </tr> <tr> <td>Ming Liu</td> <td>Academic</td> <td>Regional</td> <td>Research Collaborator</td> </tr> <tr> <td>Marty Byrnes</td> <td>Industry</td> <td>State</td> <td>Stock provider, test site</td> </tr> <tr> <td>Rob Krauss</td> <td>Industry</td> <td>Regional</td> <td>Stock provider, test site</td> </tr> </tbody> </table>	Partner	Specific Type	Level	Nature of Partnership	Paul Rawson	Academic	Regional	Research Collaborator	Ming Liu	Academic	Regional	Research Collaborator	Marty Byrnes	Industry	State	Stock provider, test site	Rob Krauss	Industry	Regional	Stock provider, test site		
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